

Sectoral Review

Private Participation in Infrastructure: Trends in Developing Countries in 1990 • 2001

8 Electricity

Electricity ranked second among infrastructure sectors in private activity in the developing world in 1990–2001. With 832 projects involving private participation in 83 countries, the sector attracted \$213 billion in investment commitments.

The recent wave of private activity in electricity began in the 1980s with a comprehensive privatization program in Chile and a few projects in other developing countries. The private activity grew rapidly in the 1990s, with annual investment commitments for private electricity projects in the developing world rising from just over \$1 billion in 1990 to a peak of \$49 billion in 1997 (figure 8.1). Investment commitments then dropped sharply as a result of the economic crises and heightened perceptions of risk in developing countries and the reduced financial capacity of many large sponsors.

The peak investment levels in 1996 and 1997 were propelled by greenfield power plants in Asia. Brazil also drove private activity in the sector, accounting for 32% of investments in 1997–98, when it privatized most of its large distribution companies. Even in a much more favorable environment it would have been difficult to sustain the investment flows of the late 1990s given the absence of massive privatization programs in other large economies. The decline in acquisitions of government assets accounted for part of the fall in annual investments (figure 8.2). Total annual investment flows in low-income countries in 1997–2001 were smaller than those in Brazil and were not subject to the same volatility.

Like investments, the number of projects with private participation grew rapidly (figure 8.3). The voucher privatization program in the Russian Federation explained most of the surge in activity in 1993, while greenfield projects in East Asia and Latin America and divestitures in Latin America accounted for most of the electricity projects in 1994–97.

Although private participation in electricity was spread among a large number of projects and sponsors in developing countries, the biggest projects and the top sponsors accounted for a significant share of the total investment commitments (boxes 8.1 and 8.2).

One feature of private activity in electricity was the focus on private ownership and management. This emphasis was reflected in the dominance of greenfield projects and divestitures in both investment and number of projects (figures 8.4 and 8.5; table 8.1).

Greenfield projects were used mainly to increase generation capacity through independent power producers. But the features of the projects varied depending on the structure of the market in which they were implemented. In largely unreformed electricity markets where state-owned enterprises had a monopoly on transmission and distribution, greenfield projects were selected by these enterprises and usually included power purchase agreements. Under these agreements state-owned enterprises guarantee the purchase of the electricity produced by the power plants at specified tariffs (typically indexed to the exchange rate) over the life of the contract. In addition, government guarantees often backstop the obligations of the power purchasing utilities. This type of greenfield project was used by most countries in Asia and the Middle East and North Africa and a few in Latin America (Costa Rica and Mexico) and Europe and Central Asia (Turkey). In reformed electricity markets where competition had been introduced in generation, greenfield projects involved power purchase agreements with privatized distribution companies and large business customers. In these markets



governments committed to keep retail electricity tariffs at cost-recovering levels rather than guaranteeing power purchase agreements. Most of these greenfield projects were awarded in Latin America and the Caribbean.

Divestitures took different forms across regions. In Latin America and some countries in Europe and Central Asia divestitures were usually structured as the sale of controlling stakes to strategic operators, which took control of the privatized companies. In other countries in Europe and Central Asia divestitures took the form of voucher privatizations and the government retained control of the privatized companies. In East Asia and Pacific divestitures were commonly carried out through public offerings of minority stakes on stock exchanges, again with the government retaining control of the companies.

Latin America and the Caribbean and East Asia and Pacific dominated private activity in the sector, leading in both investment and projects (figure 8.6; table 8.2). Latin America's dominance of investment was driven mainly by private activity in the region in 1996–2000, when Brazil privatized its distribution companies and awarded greenfield projects. Most Latin American countries introduced private participation in electricity as part of broader reforms that usually included establishing more competitive market structures (see chapter on Latin America for further discussion). In East and South Asia private activity in the sector mainly took the form of private financing of new generation capacity in markets dominated by state-owned monopolies (see chapters on East and South Asia for further discussion). Thus in East Asia most of the investment took place during the boom in greenfield projects for independent power producers in 1992–97.

In Europe and Central Asia some countries followed the Latin American approach to private participation in electricity, while others limited the participation to greenfield projects for independent power producers. In this region investment in electricity was concentrated mainly in 1995–97 and 2000, when Turkey awarded large greenfield projects for independent power producers and the Czech Republic and Hungary privatized their electricity sectors and also awarded greenfield projects for independent power producers. In the Middle East and North Africa most countries followed the Asian approach to private participation in electricity.

In Sub-Saharan Africa some countries limited private activity in the sector to the generation business through greenfield projects or divestitures, while others transferred the operation of the main integrated utilities through concessions or management or lease contracts. Most of the electricity investment in the region took place after 1995, raising the region's share in annual investment in the sector from 0% to 8% in 2001.

Private activity was initially concentrated in six countries (Côte d'Ivoire, Chile, India, the Philippines, the Republic of Korea, and Turkey), but it began to spread as more countries introduced private participation in electricity. The top five countries in 2001—Brazil, Malaysia, Poland, Oman, and China—accounted for only 52% of annual investment, while the top five countries over the period—Brazil, China, Argentina, the Philippines, and India—captured the same share of the cumulative investment in 1990–2001 (table 8.3). When private activity is measured in per capita terms, smaller countries—such as Belize, Gabon, and Cape Verde—emerge among the most active (table 8.4).

Among segments, the generation business led in investment and projects, with independent power producers (including greenfield projects and divestitures) usually attracting 50–90%

of annual investment in electricity (figure 8.7; table 8.5). The stand-alone distribution business was the second most active segment, followed by vertically integrated utilities. But most developing countries with private participation in electricity had at least some private activity in distribution (figure 8.8).

The distribution of investment among electricity segments varied significantly for different types of private participation. Of the investment in greenfield projects, 98% went to independent power producers and the other 2% to stand-alone transmission facilities (figure 8.9). Investment in divestitures was more evenly divided between generation and stand-alone distribution, the two segments attracting the most investment (figure 8.10). Vertically integrated utilities followed in third place.

By the late 1990s a clear trend had emerged of separating the sector into its three basic business units (generation, transmission, and distribution) and establishing new regulatory frameworks before privatizing assets. Annual investment figures for privatized stand-alone distribution companies and vertically integrated utilities were similar until 1997, after which stand-alone distribution companies started to attract greater investment (see figure 8.7). Similarly, distribution companies have outnumbered integrated utilities among divestitures since the mid-1990s (figure 8.11).

Investment in stand-alone generation facilities in East and South Asia was channeled mainly through build-operate-own (BOO) and build-operate-transfer (BOT) programs to expand generating capacity. In Latin America and the Caribbean stand-alone generation businesses emerged from three types of transactions: BOO and BOT schemes (83 projects), privatization of vertically separated electricity facilities (66), and merchant power plants in unbundled, competitive markets (56).

Most projects involving stand-alone distribution facilities were awarded in Latin America and the Caribbean, Europe and Central Asia, and Sub-Saharan Africa. Private participation in stand-alone transmission facilities took place in Latin America and Europe and Central Asia.

Developing countries used two schemes to introduce private participation in integrated utilities. In most cases minority stakes were sold in state-owned enterprises, a common approach in Europe and Central Asia and East Asia and Pacific. In the other cases management was also transferred to the private sector, an approach used in Latin America, Sub-Saharan Africa, and the Middle East and North Africa.

Box 8.1

Largest Electricity Projects with Private Participation in Developing Countries

The 10 largest electricity projects with private participation in developing countries accounted for 14% of the investment in such projects in 1990–2001. These projects spanned the range of service bundling, from independent power producers and stand-alone distribution companies to vertically integrated utilities. Brazil accounted for the largest number of the projects (see table).

Top 10 Electricity Projects with Private Participation, Developing Countries, 1990–2001

Project	Investment (2001 US\$ billions)	Country
Light-Serviços de Eletricidade	4.5	Brazil
Lyonnais des Eaux de Casablanca	3.4	Morocco
Elektro Eletricidade e Serviços (São Paulo)	3.3	Brazil
Companhia Paulista de Força e Luz	3.2	Brazil
PT Paiton Energy Company	2.9	Indonesia
Edesur	2.6	Argentina
Shandong China Power Company	2.4	China
Shajiao Coal-Fired Plant	2.4	China
Companhia de Eletricidade do Estado da Bahia (COELBA)	2.3	Brazil
InterGen Gebze Adapazari Izmir	2.3	Turkey
Total	29.2	

Source: World Bank, PPI Project Database.

Top Sponsors of Electricity Projects with Private Participation in Developing Countries

The top 10 sponsors of private electricity projects in developing countries accounted for 24% of the projects in 1990–2001—and their projects for just over 40% of the investment (see table). A breakdown of the major players by region shows that most have a large business base in Latin America and the Caribbean, with five of them specializing in that region. The concentration of the top sponsors' activity in Latin America and the Caribbean was driven by the extensive sector reform in the region. Another trend is the emergence of regional operators as top sponsors, such as the Chilean companies Enersis and Endesa.

Most of the top 10 sponsors took over projects involving varied approaches to bundling electricity services, from independent power producers and stand-alone distribution companies to fully integrated utilities. This was the case for AES Corporation, Electricité de France, Endesa (Spain), Enron Corporation, Electricidade de Portugal, and Mirant. Other top sponsors focused on one type of business, such as SUEZ and Endesa (Chile) with independent power producers and Enersis with stand-alone distribution companies. SUEZ invested in electricity projects mainly through its subsidiary Tractebel.

Top 10 Sponsors of Electricity Projects with Private Participation, Developing Countries, 1990–2001

Sponsor	Investment ^a (2001 US\$ billions)	Projects	Projects by region					
			East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub- Saharan Africa
AES Corporation	21.6	57	9	12	24	1	7	4
Electricité de France	15.5	28	2	6	9	4	0	7
SUEZ	11.8	44	15	7	18	2	2	0
Endesa (Spain)	11.4	12	0	0	11	1	0	0
Mirant	8.4	10	7	0	3	0	0	0
Enron Corporation	7.8	21	6	3	9	1	2	0
Enersis	7.6	8	0	0	8	0	0	0
Endesa (Chile)	7.0	14	0	0	14	0	0	0
Electricidade de Portugal	6.6	8	0	0	6	1	0	1
Iberdrola	6.3	9	0	0	9	0	0	0
Total ^b	86.2	198	39	28	99	9	11	12

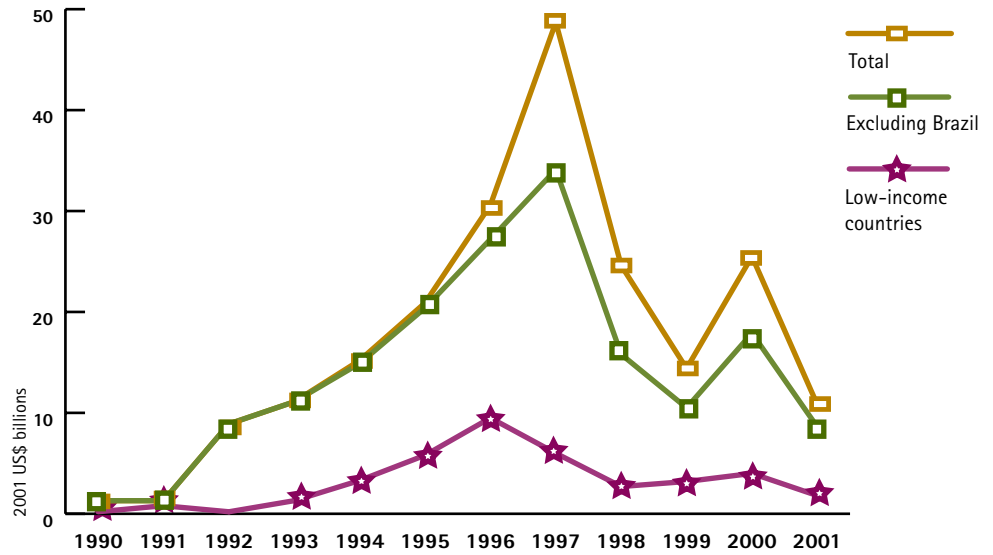
a. Investment from all sources in projects in which sponsor had an equity participation of 15% or more.

b. Data may not sum to totals because projects can be associated with more than one sponsor.

Source: World Bank, PPI Project Database.

Figure 8.1

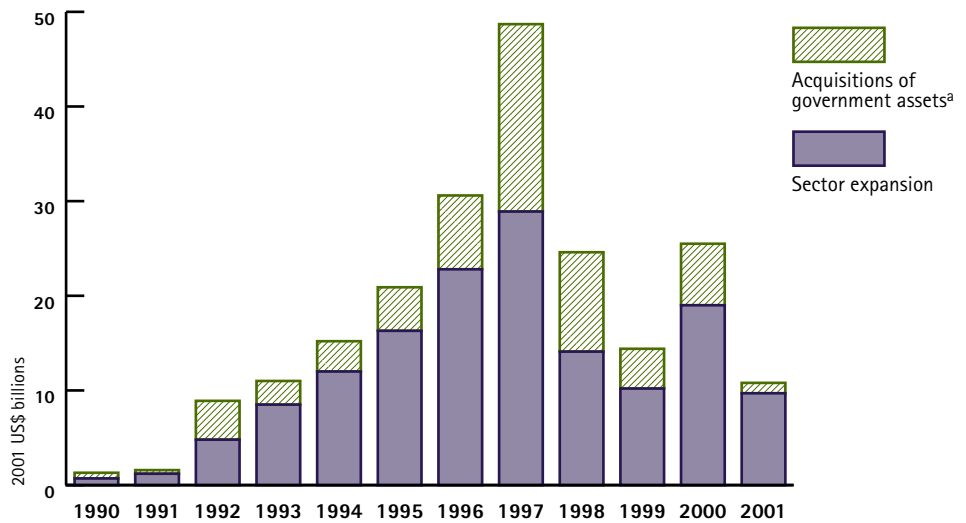
Annual Investment in Electricity Projects with Private Participation, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 8.2

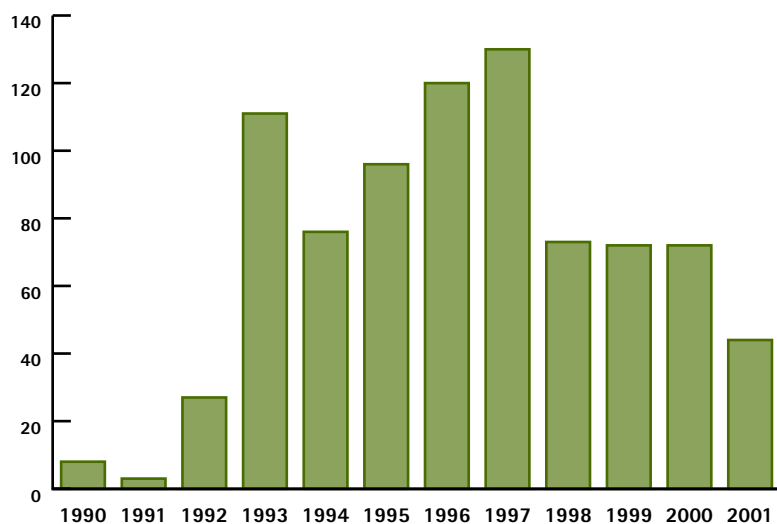
Annual Investment in Electricity Projects with Private Participation by Destination, Developing Countries, 1990–2001



a. Divestiture revenues, license fees, and canon payments.
Source: World Bank, PPI Project Database.

Figure 8.3

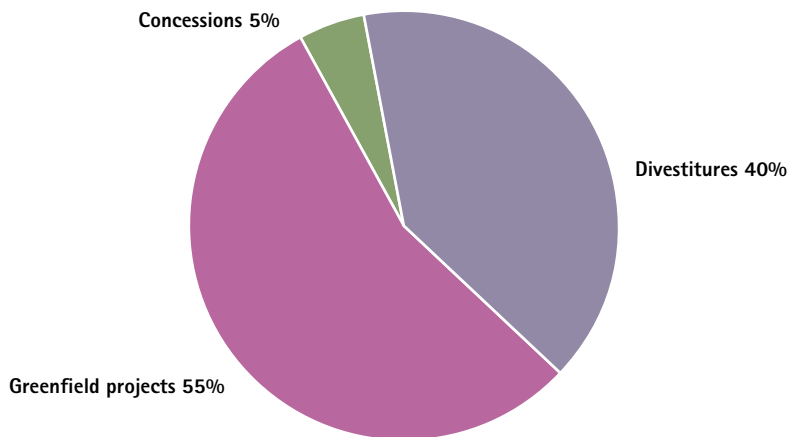
Electricity Projects with Private Participation by Year of Financial Closure, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 8.4

Cumulative Investment in Electricity Projects with Private Participation by Type, Developing Countries, 1990–2001

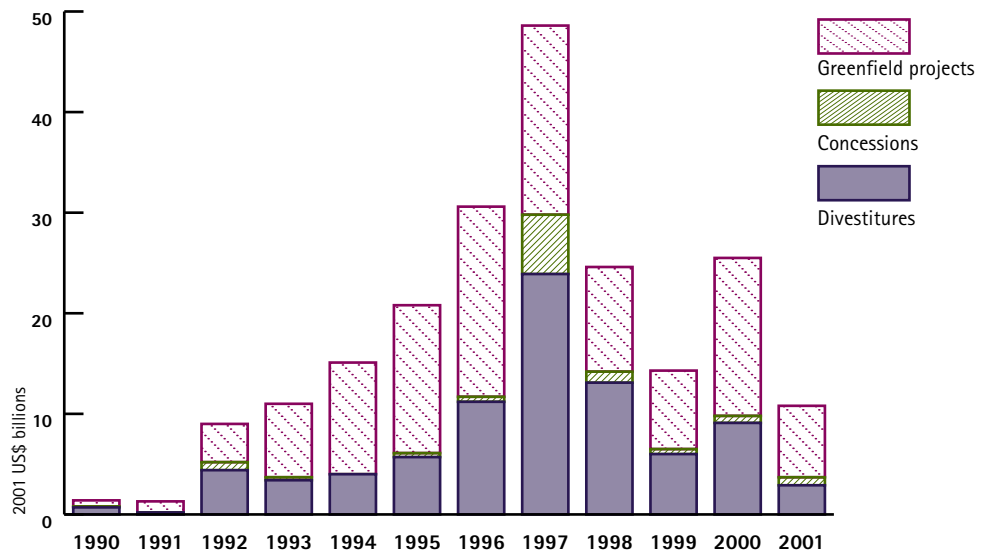


Total \$213 billion

Source: World Bank, PPI Project Database.

Figure 8.5

Annual Investment in Electricity Projects with Private Participation by Type, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Table 8.1

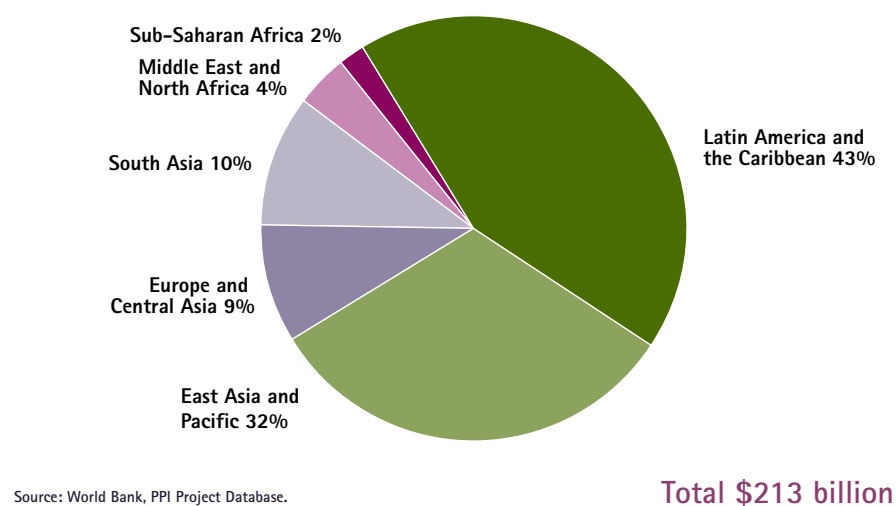
Electricity Projects with Private Participation by Type, Developing Countries, 1990–2001

Type of private participation	Projects
Concessions	35
Divestitures	328
Greenfield projects	456
Management and lease contracts	13
Total	832

Source: World Bank, PPI Project Database.

Figure 8.6

Cumulative Investment in Electricity Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Table 8.2

Private Participation in Electricity by Region, Developing Countries, 1990–2001

Region	Countries	Projects	Investment (2001 US\$ billions)
East Asia and Pacific	10	235	69
Europe and Central Asia	15	157	19
Latin America and the Caribbean	25	301	90
Middle East and North Africa	6	13	5
South Asia	5	90	22
Sub-Saharan Africa	22	36	9
Total	83	832	213

Source: World Bank, PPI Project Database.

Table 8.3**Top Five Developing Countries by Cumulative Investment in Electricity Projects with Private Participation, 1990–2001**

Country	Investment (2001 US\$ billions)	Investment as a share of developing world total (%)
Brazil	41.3	19
China	21.6	10
Argentina	18.4	9
Philippines	15.3	7
India	13.5	6
Total	110.0	52

Source: World Bank, PPI Project Database.

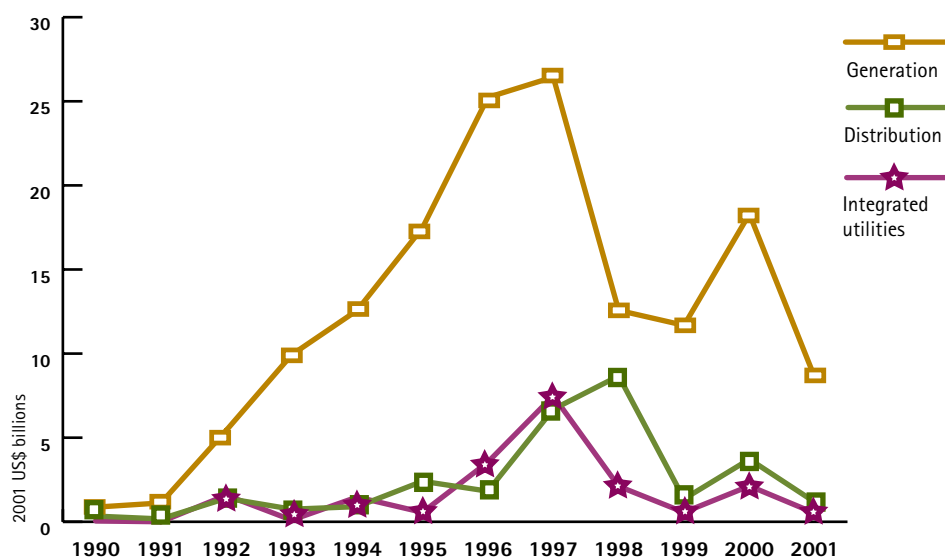
Table 8.4**Top Five Developing Countries by Per Capita Cumulative Investment in Electricity Projects with Private Participation, 1990–2001**

Country	Per capita investment (2001 US\$)	Total investment (2001 US\$ billions)
Belize	728	0.2
Gabon	546	0.7
Chile	518	8.0
Argentina	490	18.4
Cape Verde	436	0.2

Source: World Bank, PPI Project Database.

Figure 8.7

Annual Investment in Electricity Projects with Private Participation by Segment, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Table 8.5

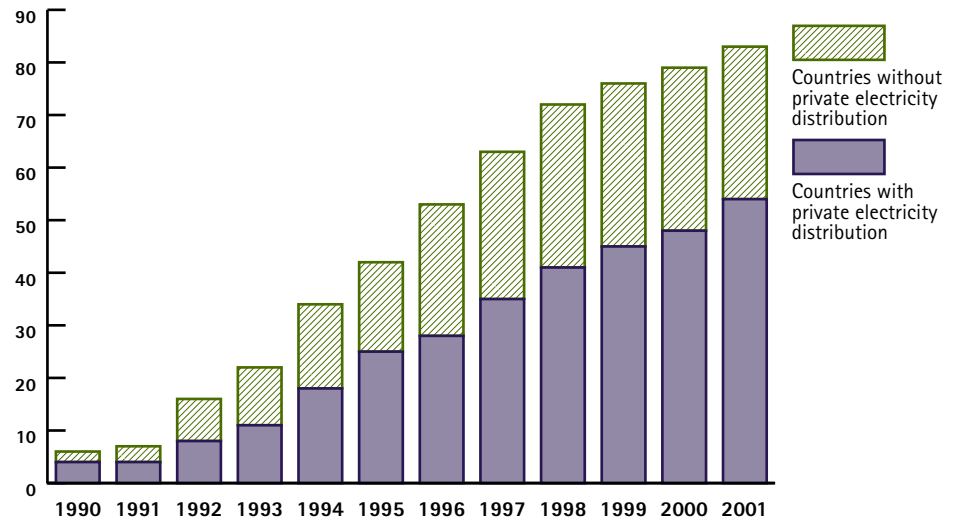
Private Participation in Electricity by Segment, Developing Countries, 1990–2001

Segment	Projects	Investment (2001 US\$ billions)
Generation	600	150.2
Distribution	89	29.4
Transmission	18	2.7
Integrated utilities	103	20.1
Distribution and generation	14	6.8
Generation and transmission	2	0.5
Distribution and transmission	6	3.4
Total	832	213.2

Source: World Bank, PPI Project Database.

Figure 8.8

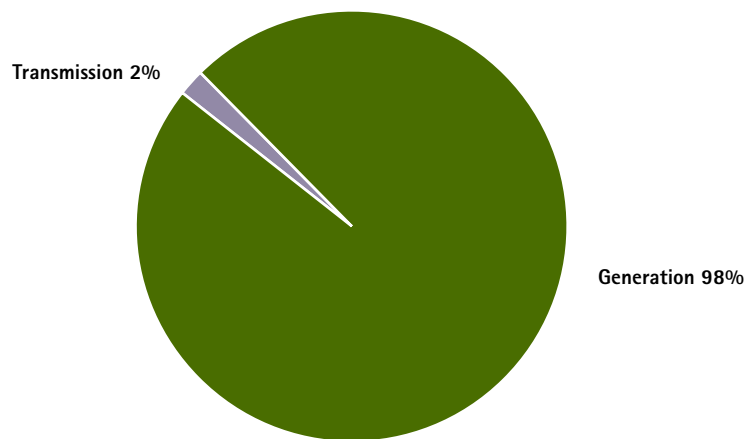
Cumulative Number of Developing Countries with Private Participation in Electricity, 1990–2001



Source: World Bank, PPI Project Database.

Figure 8.9

Cumulative Investment in Greenfield Electricity Projects with Private Participation by Segment, Developing Countries, 1990–2001

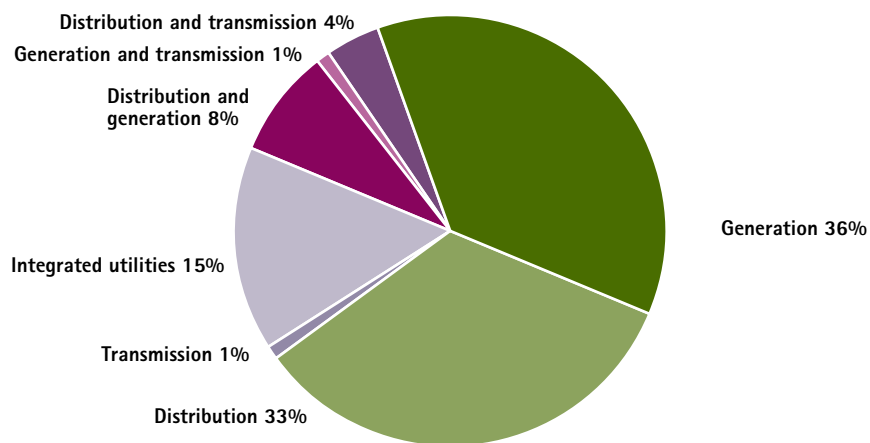


Source: World Bank, PPI Project Database.

Total \$117 billion

Figure 8.10

Cumulative Investment in Privatized Electricity Companies by Segment, Developing Countries, 1990–2001

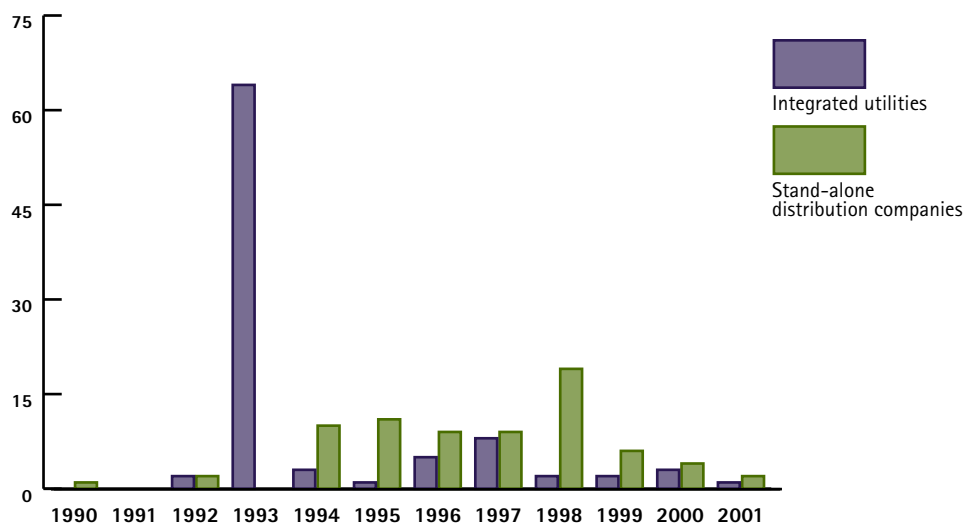


Source: World Bank, PPI Project Database.

Total \$85 billion

Figure 8.11

Privatizations of Electricity Distribution Companies and Integrated Utilities by Year of Financial Closure, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

9 Natural Gas Transmission and Distribution

Thirty-three developing countries introduced private participation in natural gas transmission and distribution (transport) in 1990–2001. These countries awarded 146 projects with private participation in the sector, attracting investment commitments of \$34 billion—5% of the investment in all private infrastructure projects in developing economies.¹

Driving the increasing participation of the private sector was a growing demand for gas transport facilities coinciding with a growing consensus in favor of private participation in infrastructure and tightening constraints on public sector budgets. And driving the increasing demand for transport facilities were strong growth in energy demand, the discovery of new gas fields, and environmental concerns.

The diverse development levels of the natural gas sector in developing countries raise policy issues quite different from those in other infrastructure sectors. Except in Europe and Central Asia and some parts of Asia and Latin America, most developing countries have limited transport facilities or none at all. Some have promoted private involvement in existing facilities, while others have relied on the private sector to establish new gas networks. Still others have no gas network—public or private.

Recent private activity in natural gas in developing countries started in 1992, when Argentina privatized its transmission and distribution assets. Annual investment in gas transport projects with private participation grew to a peak of \$6.5 billion in 1998, then declined (figure 9.1). Three export-oriented gas pipelines (one from Bolivia to Brazil and two from Argentina to Chile) and the partial divestiture of RAO Gazprom in the Russian Federation explained the peak in investment in 1998. The number of projects with private participation also grew, with the peak in 1995 driven by the privatization of distribution companies in the Czech Republic and Hungary and that in 1997 by the greenfield projects to build and operate gas distribution networks in Mexico (figure 9.2).

Although private participation in natural gas transport involved numerous projects and sponsors, the biggest projects and the top sponsors accounted for most of the investment commitments (boxes 9.1 and 9.2).

Private participation in natural gas transport tended to focus on private ownership and management. This approach was reflected in the predominance of divestitures and greenfield projects, which led the sector in both investment and projects (figure 9.3; table 9.1). As might be expected, divestitures predominated in countries with well-developed pipeline networks, while greenfield projects occurred mainly in countries with little or no transport infrastructure for natural gas.

Divestitures in the sector took different forms across regions. In Latin America and some countries in Europe and Central Asia (such as Hungary and Kazakhstan) divestitures were usually structured as the sale of controlling stakes to strategic operators, which took control of the privatized companies. In other countries in Europe and Central Asia (such as the Czech Republic) divestitures took the form of voucher privatizations, with control of the privatized companies remaining with the government. In East Asia and Pacific (China, the Republic of Korea, Malaysia, and Thailand) natural gas transport facilities were divested through public offerings of minority stakes on local or regional stock exchanges, with the government retaining control of the companies.

Latin America and the Caribbean led in investment in the sector, followed by East Asia and Pacific (figure 9.4). Latin America and the Caribbean also led in projects, followed by Europe and Central Asia (table 9.2). Most Latin American countries undertook natural gas reforms as part of broader reforms aimed at liberalizing energy markets (see chapter on Latin America and the Caribbean for further discussion). In East Asia and Pacific most countries partially privatized state-owned operators and used greenfield projects to expand transport capacity. In Europe and Central Asia the focus was on privatizing existing assets. In the other developing regions private activity in natural gas transport was limited to a few greenfield projects.

Initially concentrated in a few countries, private activity in natural gas transport spread over time. Private investment in the sector began in 1992, when the five most active countries accounted for 100% of the annual investment in natural gas infrastructure projects with private participation. In 2001 the top five countries still accounted for 99% of investment. During this period the group of top five consisted of Argentina, Brazil, Algeria and Morocco (combined), Mexico, and Bolivia, which together drew 58% of the cumulative investment in natural gas transport projects with private participation in 1990–2001 (table 9.3). When investment is measured in per capita terms, however, Hungary, Uruguay, and Chile move into the top five (table 9.4).

Private activity in the sector focused on vertically separated facilities. Stand-alone transmission pipelines dominated investment, with 33 projects accounting for 57% of the investment in private natural gas transport projects in 1990–2001 (table 9.5; figure 9.5). This predominance of transmission projects is due largely to two big export-oriented projects (the Maghreb and Bolivia-Brazil gas pipelines). Of the 33 stand-alone transmission projects, 22 were awarded in Latin America and the Caribbean. Projects for stand-alone distribution facilities, capturing 33% of the investment in private natural gas transport projects, were awarded mainly in Latin America and the Caribbean (50 projects) and Europe and Central Asia (25).

Just nine projects involved vertically integrated gas utilities, most in Europe and Central Asia (ArmRosGazprom in Armenia, Eesti Gaas in Estonia, Latvijas Gaze in Latvia, Lietuvos Dujo in Lithuania, Moldovagaz in Moldova, and RAO Gazprom in the Russian Federation). The other companies were scattered across regions (Gujarat Gas Company in India, Nile Valley Gas in the Arab Republic of Egypt, and Petronas Gas in Malaysia).

In countries without gas fields, developing or expanding a domestic natural gas industry requires international gas trade—and thus, typically, export-oriented pipelines. Nine export-oriented pipeline projects with private participation, attracting investment of \$8 billion, reached financial closure in 1990–2001: the Yadana pipeline from Myanmar to Thailand, the Maghreb pipeline from Algeria to Morocco to Europe, the Bolivia-Brazil pipeline, sections of the Yamal pipeline in Belarus and Poland, Gasoducto Cruz del Sur from Argentina to Uruguay and Brazil, and four pipelines from Argentina to Chile (GasAndes, GasAtacama, Gasoducto del Pacifico, and NorAndino). The last four projects, which launched the development of the natural gas business in Chile, were developed by fully private consortia on a competitive basis.²

Notes

1. The PPI Project Database covers projects that transport natural gas to end users. Captive pipelines owned by private upstream gas producers and condensate operations are not included.
2. Alejandro Jadresic, "Investment in Natural Gas Pipelines in the Southern Cone of Latin America," Policy Research Working Paper 2315 (World Bank, Private Sector Advisory Services Department, Private Participation in Infrastructure, Washington, D.C., 2000) [<http://econ.worldbank.org/docs/1069.pdf>].

Box 9.1

Largest Natural Gas Transmission and Distribution Projects with Private Participation in Developing Countries

In 1990–2001 the 10 largest natural gas transport projects with private participation in developing countries accounted for half the investment in such projects (see table). These 10 projects covered the range of approaches to bundling services—from stand-alone distribution companies to vertically integrated utilities to export-oriented pipelines. Most were in Latin America, which led the developing regions in private participation in natural gas transport.

Top 10 Natural Gas Transmission and Distribution Projects with Private Participation, Developing Countries, 1990–2001

Project	Investment (2001 US\$ billions)	Country
Transportadora de Gas del Sur SA (TGS)	2.9	Argentina
Maghreb Gas Pipeline	2.8	Algeria and Morocco
Bolivia–Brazil Gas Pipeline	2.4	Bolivia and Brazil
Transportadora de Gas del Norte	1.8	Argentina
RAO Gazprom	1.4	Russian Federation
Petronas Gas Sdn Bhd	1.4	Malaysia
Comgas	1.4	Brazil
Distribuidora de Gas Metropolitana	1.3	Argentina
GasAtacama	0.9	Argentina and Chile
Korea Gas Corporation	0.9	Korea, Rep. of
Total	17.2	

Source: World Bank, PPI Project Database.

Top Sponsors of Natural Gas Transmission and Distribution Projects with Private Participation in Developing Countries

The top five sponsors of private natural gas transport projects in developing countries in 1990–2001 accounted for more than 26% percent of such projects—and their projects for just over 47% of the investment (see table). A breakdown of the major players by region shows that most have a large business base in Latin America and the Caribbean, reflecting that region's predominance in private participation in natural gas transport. The top three sponsors participated in large cross-border transmission projects, while the fourth and fifth focused on transport assets for the domestic market.

Top Five Sponsors of Natural Gas Transmission and Distribution Projects with Private Participation, Developing Countries, 1990–2001

Sponsor	Investment ^a (2001 US\$ billions)	Projects	Projects by region					
			East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub- Saharan Africa
Enron Corporation	7.4	22	7	0	15	0	0	0
Gas Natural	5.0	10	0	0	9	1	0	0
Shell	4.5	4	1	0	3	0	0	0
Pérez Companc SA	4.2	2	0	0	2	0	0	0
British Gas	4.0	7	0	0	3	2	2	0
Total ^b	16.1	38	8	0	25	3	2	0

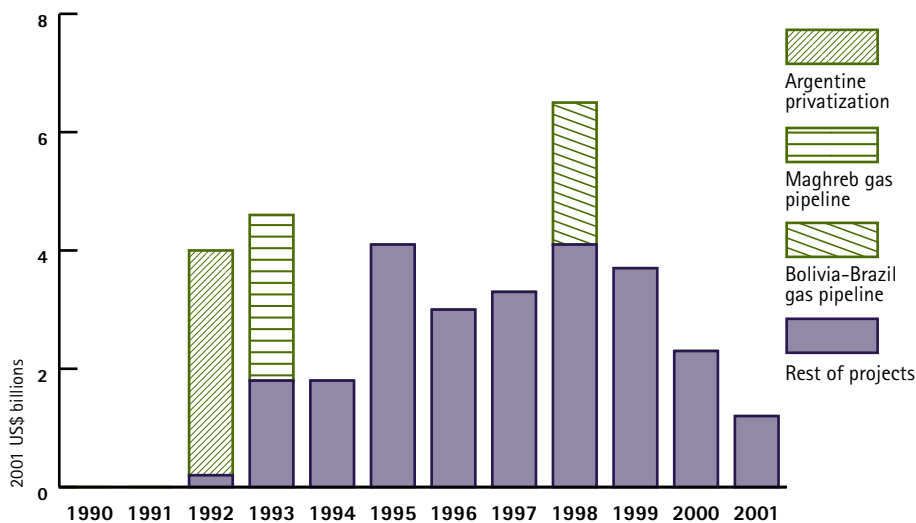
a. Investment from all sources in projects in which sponsor had an equity participation of 15% or more.

b. Data may not sum to totals because projects can be associated with more than one sponsor.

Source: World Bank, PPI Project Database.

Figure 9.1

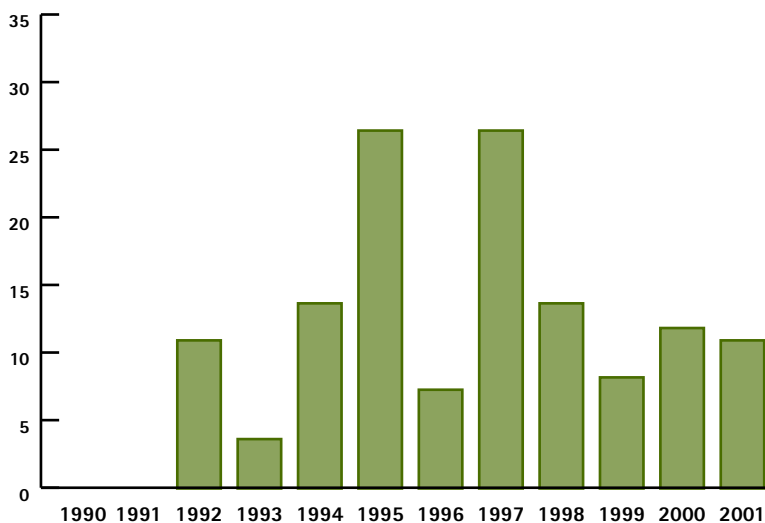
Annual Investment in Natural Gas Transmission and Distribution Projects with Private Participation, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 9.2

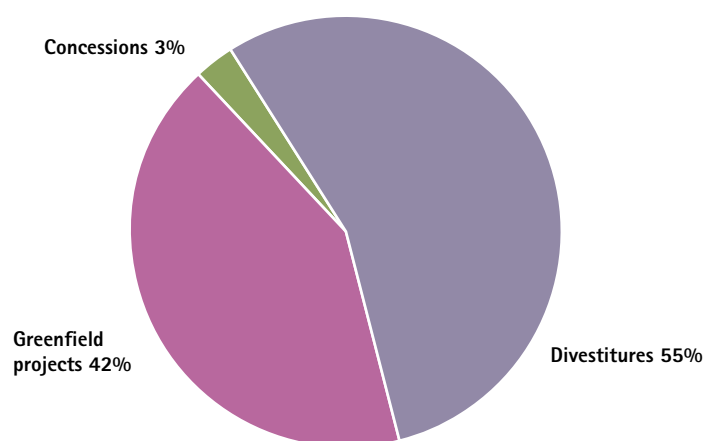
Natural Gas Transmission and Distribution Projects with Private Participation by Year of Financial Closure, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 9.3

Cumulative Investment in Natural Gas Transmission and Distribution Projects with Private Participation by Type, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$34 billion

Table 9.1

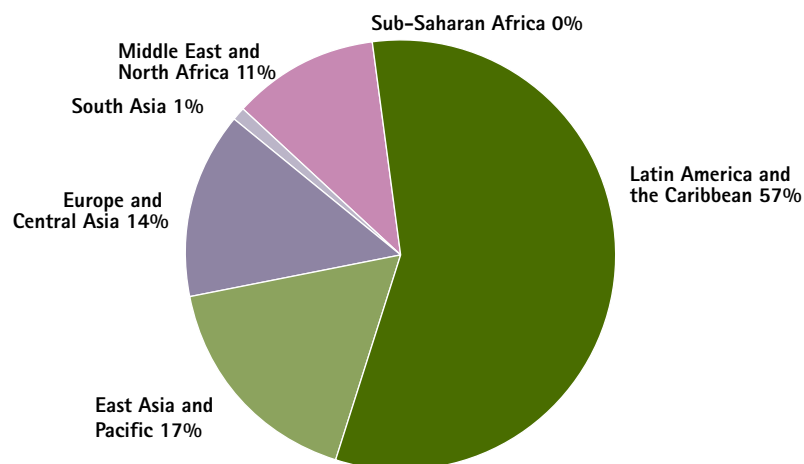
Natural Gas Transmission and Distribution Projects with Private Participation by Type, Developing Countries, 1990–2001

Type of private participation	Projects
Concessions	4
Divestitures	64
Greenfield projects	78
Management and lease contracts	0
Total	146

Source: World Bank, PPI Project Database.

Figure 9.4

Cumulative Investment in Natural Gas Transmission and Distribution Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$34 billion

Table 9.2

Private Participation in Natural Gas Transmission and Distribution by Region, Developing Countries, 1990–2001

Region	Countries	Projects	Investment (2001 US\$ billions)
East Asia and Pacific	7	31	6.0
Europe and Central Asia	12	35	4.7
Latin America and the Caribbean	7	71	19.6
Middle East and North Africa	4	4	3.9
South Asia	1	3	0.2
Sub-Saharan Africa	2	2	0.1
Total	33	146	34.5

Source: World Bank, PPI Project Database.

Table 9.3

Top Five Developing Countries by Cumulative Investment in Natural Gas Transmission and Distribution Projects with Private Participation, 1990–2001

Country	Investment (2001 US\$ billions)	Investment as a share of developing world total (%)
Argentina	10.6	31
Brazil	4.9	14
Algeria and Morocco	2.8	8
Bolivia	2.7	8
Mexico	2.0	6
Total	20.1	58

Source: World Bank, PPI Project Database.

Table 9.4

Top Five Developing Countries by Per Capita Cumulative Investment in Natural Gas Transmission and Distribution Projects with Private Participation, 1990–2001

Country	Per capita investment (2001 US\$)	Total investment (2001 US\$ billions)
Bolivia	314	2.7
Argentina	282	10.6
Hungary	162	1.6
Uruguay	131	0.4
Chile	120	1.8

Source: World Bank, PPI Project Database.

Table 9.5

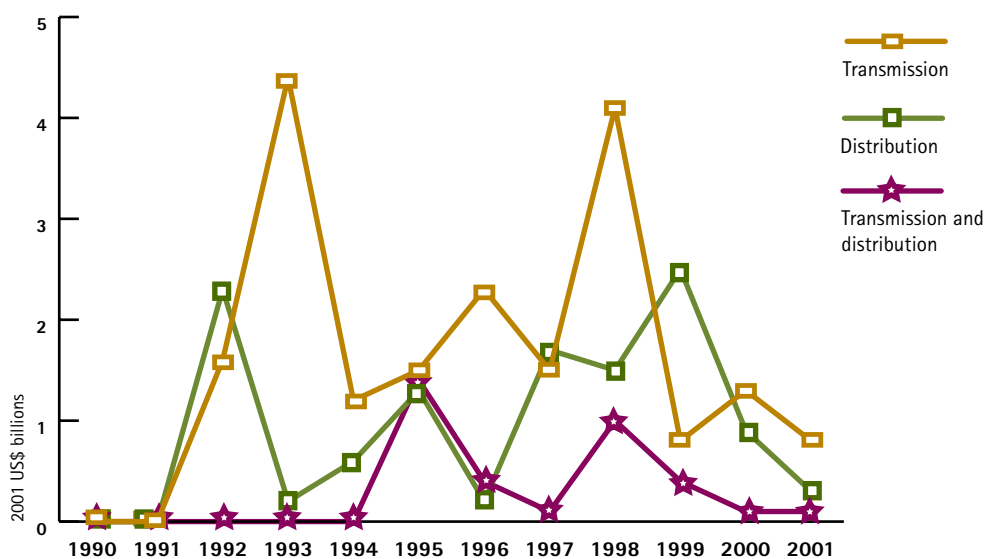
Private Participation in Natural Gas Transmission and Distribution by Segment, Developing Countries, 1990–2001

Segment	Projects	Investment (2001 US\$ billions)
Transmission	33	19.6
Distribution	104	11.5
Distribution and transmission	9	3.4
Total	146	34.5

Source: World Bank, PPI Project Database.

Figure 9.5

Annual Investment in Natural Gas Transmission and Distribution Projects with Private Participation by Segment, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

10 Telecommunications

Among infrastructure sectors, telecommunications led in private participation in developing countries in 1990–2001, attracting \$331 billion in investment commitments. During that period 115 developing countries awarded 651 telecommunications projects with private participation.

Private activity in telecommunications started in the second half of the 1980s as a few countries (such as Chile and Guinea-Bissau) privatized their main telecommunications operators and issued the first mobile licenses. But it turned into a worldwide trend in the 1990s. Developing countries saw annual investment in telecommunications projects with private participation grow from \$6.2 billion in 1990 to a peak of \$57 billion in 1998 before it began to decline (figure 10.1). The fall was explained mainly by the decline in acquisitions of government assets, which had peaked in 1998 with the divestiture of the Telebras system in Brazil. By contrast, annual investments in sector expansion continued to grow until 1999. They then declined, but only slightly, as a result of the economic crises in developing countries and the reduced financial capacity of key sponsors (figure 10.2).

Brazil has been among the main drivers of private activity since 1998, when it privatized its entire telecommunications sector. Brazil accounted for more than 50% of the investment that year and for 20–25% in 1999–2001. Even in a much more positive market environment it would have been difficult to sustain the peak investment flows of the late 1990s given the absence of massive privatization programs in other large economies. Annual investment flows in low-income countries over this period, which were smaller than those in Brazil, did not show the same volatility.

Like investment in the sector, the number of projects with private participation also grew rapidly. The voucher privatization program in the Russian Federation explained most of the peak in 1993 (figure 10.3).

Although private participation in telecommunications was spread among a large number of projects and sponsors in developing countries, the biggest projects and the top sponsors accounted for a significant share of the total investment commitments (boxes 10.1 and 10.2).

Private activity in telecommunications was defined by a strong focus on private ownership and management. This trend was reflected in the predominance of divestitures and greenfield projects in both investment and projects (figure 10.4; table 10.1).

Divestitures in the sector took different forms across regions. In East and South Asia divestitures were commonly carried out through public offerings of minority stakes on local or regional stock exchanges, with the government keeping control of the companies. In the other developing regions divestitures were usually structured as the sale of controlling stakes to strategic operators. In the first half of the 1990s governments opting for this type of divestiture often granted the privatized companies 5- to 10-year monopoly rights in basic services. But toward the late 1990s governments started to use shorter monopolies or approaches favoring competition more, such as duopolies or even free entry.

Greenfield projects were used mainly to introduce mobile services and to create competition in telecommunications markets. Thus the growth in their share in annual investment—from

9% in 1990 to 43% in 2001—reflects the rapid development of mobile telecommunications markets and the rising number of countries opening basic services to competition.

Latin America and the Caribbean, which pioneered private activity in the sector, dominated investment in the 1990s as most countries in the region transformed telecommunications into an entirely private activity (figure 10.5). But the region's share in annual investment in telecommunications fell from 75% in 1990 to 45% in 2001 as other regions opened the sector to private operators. East Asia and Pacific and Europe and Central Asia accounted for most of the remaining investment—and Europe and Central Asia led in projects with private participation (table 10.2). In East and South Asia the private sector entered a business dominated by state-owned enterprises. By contrast, most countries in Europe and Central Asia followed the Latin American approach to private activity, although a few limited private participation to mobile services.

Private participation in telecommunications also grew rapidly in Sub-Saharan Africa, with the region's share in annual investment rising from 0% in 1993 to 10% in 2001. In most African countries the private sector focused on providing mobile services, while state-owned enterprises continued to play a major role. But 13 Sub-Saharan African countries also privatized their telecommunications operators. In the Middle East and North Africa private activity was limited to the provision of new services except in Jordan and Morocco, which privatized incumbent operators.

Initially concentrated in a few countries, private activity in telecommunications began to spread over time. At the beginning of the 1990s the top five countries accounted for 98% of annual investment in telecommunications projects with private participation, but by 2001 the share of the top five had fallen to 59%. The five countries with the greatest cumulative investment in 1990–2001 as a whole were some of the largest economies in Latin America and East Asia (table 10.3). But when investment is expressed in per capita terms the list of top five changes significantly, with smaller economies such as Estonia and Panama appearing among the most active (table 10.4).

Among segments, fully integrated providers and stand-alone mobile operators dominated investment (table 10.5). Most integrated providers were privatized incumbent companies bundling fixed line local, long-distance, and mobile phone services. Although such companies accounted for the largest share of cumulative investment in 1990–2001, their share in annual investment fell from more than 90% in the early 1990s to 33% in 2001. The main reason for the decline is the rapid growth in stand-alone mobile services, reflecting the worldwide boom in mobile telephony in the 1990s (figure 10.6). Almost all stand-alone mobile service companies were created through greenfield projects.

Underlying the trends in private participation in telecommunications have been major technological and other developments that have facilitated the emergence of competition. Technological changes in the past decade have reduced entry costs, allowed major reforms in market structure, and spurred competition. The growing demand for more and better telecommunications services in developing countries in a context of tight fiscal constraints has prompted governments to turn to private investment for expanding and modernizing networks—and to reform legal and regulatory frameworks to allow private participation and competition. And their commitments to sector reform have been strengthened by international agreements. By 2001, 63 developing countries had signed the World Trade Organization's Basic Agreement on Telecommunications, which created binding commitments for its signatories to liberalize telecommunications.

Thus private activity in telecommunications has taken place in increasingly competitive markets. By 2001 most developing economies with private participation had exposed mobile phone services to competition, though they were taking a more cautious approach to basic services.

In 1990–2001 almost 400 private operators provided mobile services on a stand-alone basis or combined with basic services in 119 countries. Many of these countries also encouraged competition for the market by awarding mobile phone licenses through competitive tenders. By 2001 more than half had three to six competing mobile operators, and more than a quarter had duopoly mobile phone markets. Most of those with monopoly markets for mobile services were small economies in East Asia, Latin America, and Sub-Saharan Africa. In most countries introducing competition, consumers benefited through lower tariffs, expanded networks, and better service.

Competition also emerged in the provision of long-distance services. Of the 73 developing countries that allowed private participation in long-distance services, 19 opened the segment to some competition by 2001. Market structures ranged from unrestricted entry (Argentina, Chile, El Salvador, Guatemala) to managed competition (the Republic of Korea, Malaysia) to transitional duopoly (Brazil, Ghana, Mauritania). Most of the other countries awarded temporary exclusive licenses to privatized incumbent monopolies. The number of countries with competition in long-distance services will grow as those temporary monopolies end in the coming years and as other developing countries introduce sector reforms aimed at creating competitive markets—the most recent example being India. Other countries, particularly those in Eastern Europe, are expected to liberalize their markets in 2002–03.

Some developing countries introduced competition in local fixed line services. Of the 74 countries with private activity in this segment, 26 introduced some competition by 2001. Some of these allowed free entry (Argentina, El Salvador, Guatemala, Mexico). Others introduced controlled competition (the Republic of Korea, Malaysia) or transitional duopolies (Brazil, India, Uganda). The other 48 countries awarded transitional monopoly rights to privatized incumbent operators (the Czech Republic, Hungary, Pakistan, South Africa) or introduced private investment to complement the incumbent's (Bangladesh, Indonesia, Thailand).

Box 10.1

Largest Telecommunications Projects with Private Participation in Developing Countries

In 1990–2001 the 10 largest telecommunications projects with private participation in developing countries were fully or partially privatized incumbent operators providing all telecommunications services (see table). These projects, mainly in Latin America, accounted for 35% of the investment in private telecommunications projects during the period.

Top 10 Telecommunications Projects with Private Participation, Developing Countries, 1990–2001

Project	Investment (2001 US\$ billions)	Country
Teléfonos de México (Telmex) ^a	30.4	Mexico
Korea Telecom (KT)	11.9	Korea, Rep. of
Tele Norte Leste Participações (TNL)	10.9	Brazil
Telesp Participações SA	10.6	Brazil
Telecom Argentina	10.6	Argentina
Telefónica de Argentina	10.2	Argentina
Compañía Anónima Nacional Teléfonos de Venezuela	9.7	Venezuela, RB
Telefónica del Perú	7.5	Peru
Matáv Rt.	6.8	Hungary
China Mobile HK	6.5	China
Total	115.1	

a. Including fixed and mobile lines as well as long-distance services. Mobile services were spun off in 2001 to America Movil.
Source: World Bank, PPI Project Database.

Top Sponsors of Telecommunications Projects with Private Participation in Developing Countries

The top 10 sponsors of private telecommunications projects in developing countries in 1990–2001 accounted for 15% of the projects—and their projects for 52% of the investment (see table). This concentration of investment among the top sponsors was driven mainly by their focus on privatized incumbent operators providing all telecommunications services. One exception to this approach was BellSouth Corporation, which focused on stand-alone mobile phone companies through greenfield projects. Most of the top 10 sponsors concentrated their activity in Latin America and the Caribbean, where there has been extensive liberalization in the sector.

Top 10 Sponsors of Telecommunications Projects with Private Participation, Developing Countries, 1990–2001

Sponsor	Investment ^a (2001 US\$ billions)	Projects	Projects by region					
			East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub- Saharan Africa
Telefónica	35.2	12	0	0	11	1	0	0
Carso Global Telecom	34.8	5	0	0	5	0	0	0
Telecom Italia	30.7	16	0	3	13	0	0	0
France Télécom	26.6	27	2	6	6	4	0	9
Deutsche Telekom	18.4	18	3	13	0	0	0	2
SBC Communications	13.8	9	0	0	7	0	0	2
Inepar	12.6	5	0	0	5	0	0	0
Andrade Gutierrez	10.9	1	0	0	1	0	0	0
BellSouth Corporation	10.4	11	0	0	11	0	0	0
Portugal Telecom	9.9	6	0	0	2	1	0	3
Total ^b	172.2	100	5	22	52	5	0	16

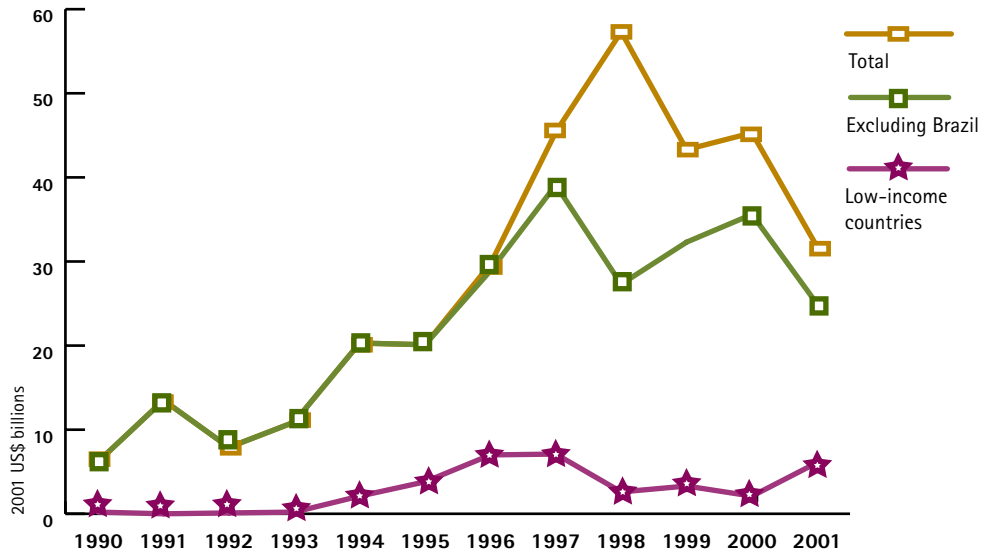
a. Investment from all sources in projects in which sponsor had an equity participation of 15% or more.

b. Data may not sum to totals because projects can be associated with more than one sponsor.

Source: World Bank, PPI Project Database.

Figure 10.1

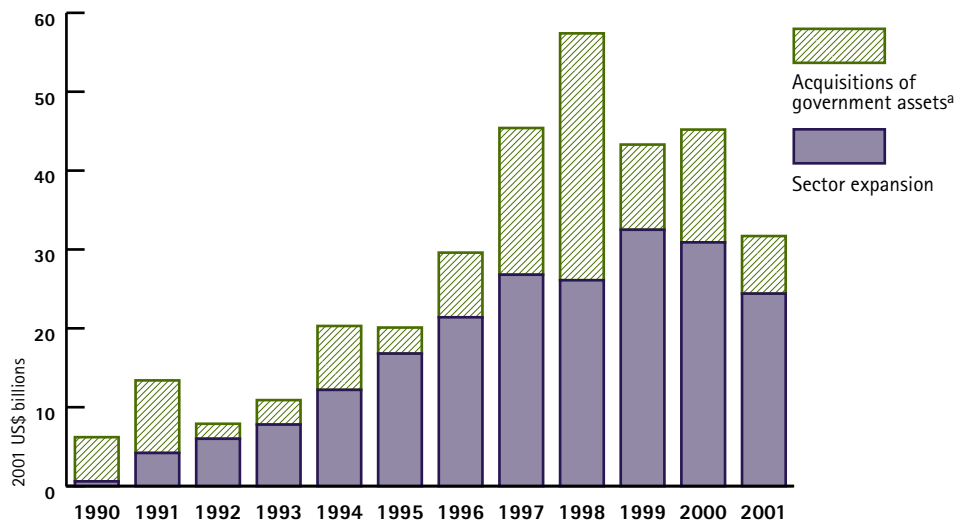
Annual Investment in Telecommunications Projects with Private Participation, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 10.2

Annual Investment in Telecommunications Projects with Private Participation by Destination, Developing Countries, 1990–2001

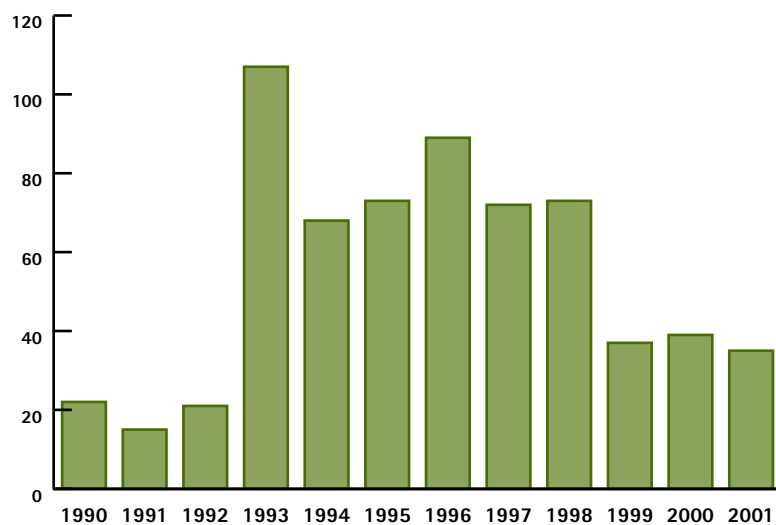


a. Divestiture revenues, license fees, and canon payments.

Source: World Bank, PPI Project Database.

Figure 10.3

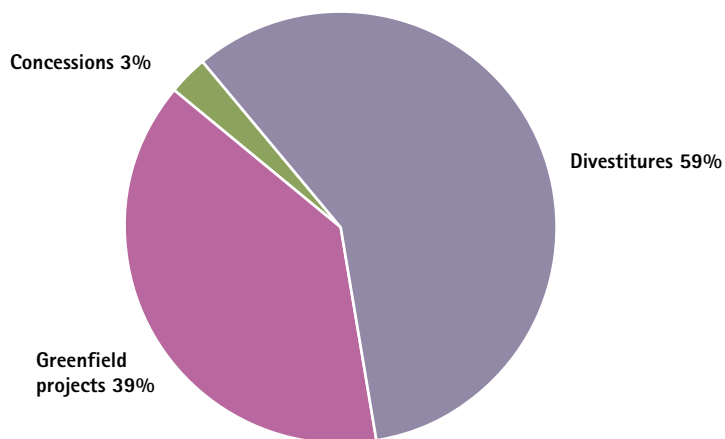
Telecommunications Projects with Private Participation by Year of Financial Closure, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 10.4

Cumulative Investment in Telecommunications Projects with Private Participation by Type, Developing Countries, 1990–2001



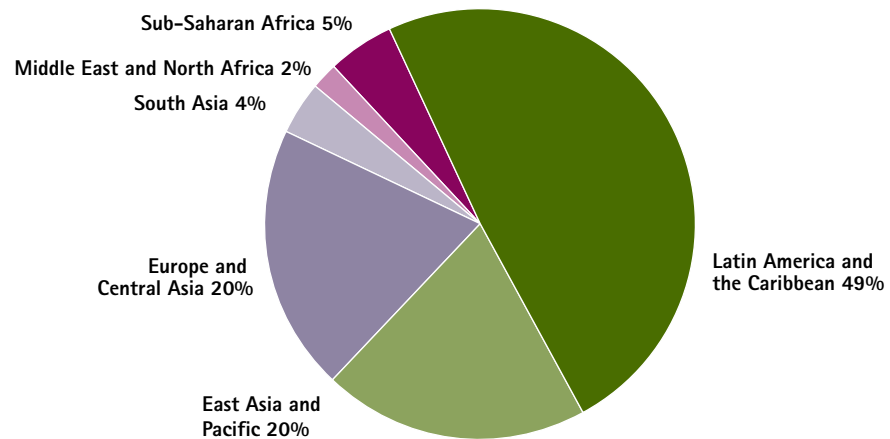
Source: World Bank, PPI Project Database.

Total \$331 billion

Table 10.1**Telecommunications Projects with Private Participation by Type, Developing Countries, 1990–2001**

Type of private participation	Projects
Concessions	7
Divestitures	177
Greenfield projects	465
Management and lease contracts	2
Total	651

Source: World Bank, PPI Project Database.

Figure 10.5**Cumulative Investment in Telecommunications Projects with Private Participation by Region, Developing Countries, 1990–2001**

Source: World Bank, PPI Project Database.

Total \$331 billion

Table 10.2**Private Participation in Telecommunications by Region, Developing Countries, 1990–2001**

Region	Countries	Projects	Investment (2001 US\$ billions)
East Asia and Pacific	15	65	65.0
Europe and Central Asia	25	296	64.9
Latin America and the Caribbean	23	120	163.2
Middle East and North Africa	8	18	8.1
South Asia	5	52	14.6
Sub-Saharan Africa	39	100	15.7
Total	115	651	331.4

Source: World Bank, PPI Project Database.

Table 10.3**Top Five Developing Countries by Cumulative Investment in Telecommunications Projects with Private Participation, 1990–2001**

Country	Investment (2001 US\$ billions)	Investment as a share of developing world total (%)
Brazil	64.4	19
Mexico	38.2	12
Argentina	27.4	8
Korea, Rep. of	21.7	7
Indonesia	12.7	4
Total	164.5	50

Source: World Bank, PPI Project Database.

Table 10.4**Top Five Developing Countries by Per Capita Cumulative Investment in Telecommunications Projects with Private Participation, 1990–2001**

Country	Per capita investment (2001 US\$)	Total investment (2001 US\$ billions)
Hungary	992	9.9
Czech Republic	877	9.0
Argentina	732	27.4
Estonia	687	0.9
Panama	544	1.6

Source: World Bank, PPI Project Database.

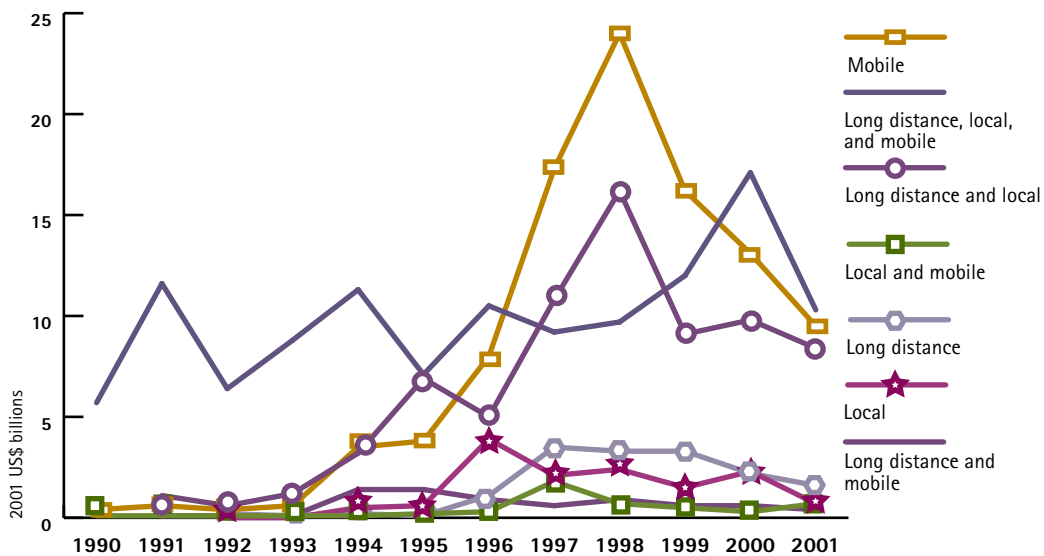
Table 10.5**Private Participation in Telecommunications by Segment, Developing Countries, 1990–2001**

Segment	Projects	Investment (2001 US\$ billions)
Long distance, local, and mobile	51	119.8
Mobile	324	97.4
Local and long distance	61	72.3
Long distance	36	15.5
Local	154	14.0
Long distance and mobile	11	7.1
Local and mobile	14	5.3
Total	651	331.4

Source: World Bank, PPI Project Database.

Figure 10.6

Annual Investment in Telecommunications Projects with Private Participation by Segment, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

11 Transport

In 1990–2001 private activity in transport took place in 66 developing countries. These countries awarded 662 transport projects with private participation that attracted \$135 billion in investment commitments.

Private activity in transport started in the 1980s, with 13 developing countries awarding 25 projects (mainly toll road projects in Mexico, Malaysia, and Thailand) attracting more than \$12 billion in 1984–89. The private activity grew rapidly in the 1990s. Annual investment in transport projects with private participation exceeded \$10 billion in 1990, driven mainly by toll road projects awarded in Argentina and Mexico. Investment declined sharply in 1991 but then gradually grew to a peak of almost \$22 billion in 1997 (figure 11.1). Investment fell after that, though it recovered slightly in 2000 and 2001. Concessions of toll roads in Brazil and China, railways in Brazil, and the airport system in Argentina accounted for a large share of the investment during the years of peak activity (1996–98). The number of projects showed a similar pattern, rising to a peak (103) in 1997, then falling (figure 11.2).

Private participation in transport was spread among a large number of projects and sponsors in developing countries. The biggest projects and the top sponsors accounted for a significant share of the total investment commitments (boxes 11.1 and 11.2). But investment was less concentrated among top projects and sponsors in transport than in other sectors.

Countries introducing private participation in transport tended to focus on transferring the management of existing assets to the private sector while keeping legal ownership of those assets in the public sector. This approach was reflected in the predominance of concessions, which led in both investment and projects (figure 11.3; table 11.1). Greenfield projects, mainly for building roads and seaport facilities, were the second most common type of private participation.

Countries also used various forms of divestitures in transport. China, which accounted for half the divestitures in the sector, offered minority stakes on stock exchanges, allowing state-owned enterprises to raise capital while the government retained control of these companies. Using this approach, China partially privatized large toll road, railway, and airport operators. The Russian Federation carried out divestitures through voucher privatization schemes. And the Latin American countries that divested transport companies (Bolivia and Chile) used public tenders of controlling stakes.

Latin America had the most private activity in transport, followed by East Asia (figure 11.4; table 11.2). The growth of the sector in these two regions coincided with the opening of other infrastructure sectors to private activity and, particularly in Latin America, with progress toward establishing legal and regulatory institutions that promote private participation.

In the other developing regions private participation in transport took place mostly in the second half of the 1990s and mainly in one or two subsectors. Private activity focused on toll roads and airports in Europe and Central Asia, seaports in South Asia, toll roads and seaports in Sub-Saharan Africa, and seaports and airports in the Middle East and North Africa (see regional chapters for further discussion).

In 1990 just five countries accounted for 100% of the annual investment in transport projects with private participation. But by 2001 the share of the top five had dropped to 76%. Over the 12-year period the top five countries—China, Brazil, Argentina, Mexico, and Malaysia—captured 68% of the cumulative investment in private transport projects (table 11.3). Measuring investment in per capita terms changes the top five list, introducing smaller economies—Panama, Chile, and Estonia—among the most active (table 11.4).

Airports

Thirty-five developing countries introduced private participation in airports in 1990–2001, granting 82 projects involving 224 airports (table 11.5). Private interest in the airport sector had been spurred by the growth in air transport and airport revenues—growth fueled by deregulation and the establishment of “open skies” agreements among countries. Annual investment in airport projects with private participation grew from zero in 1990 to \$5.3 billion in 1998, then declined (figure 11.5). The peak in 1998 was driven mainly by the concession of the airport system in Argentina.

Concessions dominated private activity in airports, accounting for 76% of the investment and 49% of the projects in 1990–2001. Developing countries opted for concessions rather than divestitures to avoid political resistance to private participation, as airport assets tend to be seen as strategic for national security.

Divestitures ranked second in investment, attracting a 15% share over the period. Airport divestitures took different forms. Seven of the 16 divestitures—in Bolivia, the Russian Federation, and South Africa—introduced private management through the sale of controlling stakes. In China, Malaysia, and Poland state-owned enterprises used public stock offerings to raise funds for rehabilitating and expanding airports but continued to operate the facilities.

The 19 greenfield airport projects attracted 8% of the investment in 1990–2001. Other than the new terminal in Hungary’s main airport, greenfield projects involved stand-alone cargo terminals or secondary airports.

Management and lease contracts were scarce, involved in only two projects in Colombia and one each in Cuba, India, the Lao People’s Democratic Republic, Madagascar, and Mauritius. The scarcity of such contracts may result from an interest by governments in engaging the private sector primarily as a way to raise funds for infrastructure rather than as a preferred approach to management.

Latin America and the Caribbean led the regions in private activity in airports, with 57% of the investment and 32 projects in 1990–2001 (figure 11.6; table 11.6). Driving these results was the concession of the Argentine airport system. The concession, which transferred most of the system to private sponsors, accounted for 30% of investment commitments to airports in the region. Concessions were the predominant type of private participation in airports in Latin America.

East Asia and Pacific was the second most active region, with 21% of the investment in airport projects with private participation. Of the 17 airport projects in the region, 7 were divestitures, accounting for almost half the investment. The 5 airport concessions in the region accounted for most of the other investment.

Among countries, Argentina captured the most investment (\$4.0 billion), followed by China (\$1.7 billion), Mexico (\$1.3 billion), the Arab Republic of Egypt (\$704 million), and the Dominican Republic (\$499 million). Together, these five awarded projects involving 89 airports. When countries are ranked by number of projects, China comes out on top (10 projects), followed by Chile (8) and Egypt (6). Argentina, Colombia, Mexico, the Russian Federation, and South Africa had 4 projects each.

Most private activity in airports was directed to projects bundling terminal and runway facilities. Developing countries awarded 54 such projects in 1990–2001, involving investment commitments of more than \$10.1 billion (table 11.7). Stand-alone terminals were the second most common type of project, with 26 projects attracting \$1.9 billion in investment. Airport projects including terminals tend to be more attractive because they give access to nonaeronautical revenues, which usually have been unregulated and may offer large income streams. Stand-alone runway projects, whose revenues have tended to be regulated and more stable, were less common: only two such projects were awarded in 1990–2001.

Projects bundling airport networks rather than facilities became more common at the end of the 1990s, especially in Latin America and the Caribbean. Of the 13 network projects awarded by 2001, 11 were granted in 1998–2001. The largest of these projects was in Argentina, where private sponsors committed to operate and maintain 33 airports for 30 years.

Railways

Private activity in railways took place in 27 developing countries in 1990–2001. Annual investment commitments for railway projects with private participation grew from zero in 1990 to almost \$7 billion in 1996, then declined. The peak of activity in 1996 was driven mainly by railway concessions in Brazil. Over the 12-year period railways captured 21% of the investment in transport projects with private participation, ranking second among subsectors.

Concessions were the most common type of private participation in railways, accounting for 70% of the investment in the subsector in 1990–2001. Concessions were used to improve the management of loss-making railways and rehabilitate deteriorating infrastructure. The length of railway concessions varied with investment needs. Where the operator invested only in rolling stock, concession contracts ranged from 10 to 15 years. But where the operator had to invest in substantial restoration of the track, contracts were up to 90 years. Most railway projects in Latin America and the Caribbean were implemented through concessions.

Greenfield projects ranked second in investment, capturing a 27% share. Of the seven greenfield projects in railways, six were awarded in rapidly growing cities of East Asia and Pacific. This regional concentration mirrors the pattern in gas, electricity, and water and sewerage. In all these sectors private participation in Asia focused on expanding capacity in response to rapid urbanization and growing demand for infrastructure services rather than improving the efficiency of existing public operators. Greenfield projects were also distinguished by their concentration by segment: all were for metropolitan light or “heavy” rail systems rather than for long-distance freight lines.

The nine divestitures in railways followed no standard model. They included full and partial privatizations aimed at transferring operation to a strategic investor (Brazil, Chile, and Estonia) or raising revenue (China).

Latin America and the Caribbean led the regions in private activity in railways (figure 11.7; table 11.8). Countries in East Asia and Pacific awarded fewer contracts, although the projects' size and type (greenfield) meant more private investment per project. Other regions had only a few railway projects with private participation, while South Asia had none.

Among countries, Brazil led in investment (\$6.7 billion), followed by Argentina (\$6.1 billion), Malaysia (\$5.6 billion), Mexico (\$4.3 billion), and Thailand (\$3.3 billion). When countries are ranked by number of projects, Argentina moves into first place (15 projects), followed by Brazil (14), Malaysia (6), Mexico (6), and the Czech Republic (4).

Private activity focused on vertically integrated companies—projects that bundle rolling stock and fixed assets. This type of project accounted for 73% of the investment and 64% of the projects in 1990–2001 (table 11.9). Introducing competition in the railway business was not a major concern for governments because railways, even as regional monopolies, usually face competition from other modes of transport. Most of the other private activity in railways was directed to freight and passenger rail services, with the government retaining the operation of fixed assets.

Seaports

Forty-one developing countries opened the seaport business to private participation in 1990–2001. Annual investment in seaport projects with private participation grew from zero in 1990 to \$4.6 billion in 1997, then fluctuated significantly. Among transport subsectors, seaports ranked second in number of projects and third in investment.

Concessions were the most common type of private participation in seaports, accounting for 53% of the investment and 46% of the projects. These projects fostered the rehabilitation of terminals and the renewal of superstructure, such as cranes and yard equipment. With few exceptions, public authorities retained obligations for investing in berths and breakwater facilities and maintaining access channels. The seaport concessions were implemented mainly in Latin America and the Caribbean (52 projects) and East Asia and Pacific (20).

Greenfield projects were the second most common type of private participation in seaports, with 44% of the investment and 33% of the projects. These projects took place mainly in East Asia and Pacific (24 projects), where rapid growth in trade and insufficient infrastructure created a need for new port facilities.

Divestitures played a limited role in the seaport business, accounting for only 13 projects. There was no standard model for these privatizations. The Russian Federation transformed seaports into publicly traded companies through voucher privatizations. Brazil divested captive port facilities in privatizing oil, steel, and mining, then opened the facilities to third-party access. China sold minority stakes in port operators on local stock exchanges.

East Asia and Pacific led developing regions in investment in seaport projects with private participation, with 8 countries granting 52 projects (figure 11.8; table 11.10). In Latin America and the Caribbean, ranking second in investment, 13 countries awarded 78 seaport projects. The other regions had only a few seaport projects involving private participation.

Among countries, China garnered the most investment (\$3.1 billion), followed by Indonesia (\$2.2 billion), Malaysia (\$2.1 billion), Brazil (\$1.7 billion), and India (\$1.1 billion). When

countries are ranked by number of projects, Brazil moves to the top (23 projects), followed by China (22), Mexico (18), Argentina (13), and the Russian Federation (9).

Private activity in seaports focused mainly on stand-alone terminals, which drew 74% of the investment in seaport projects with private participation in 1990–2001 (table 11.11). Among types of terminals, container terminals accounted for the largest share of investment and projects. Private participation in seaport projects involving all facilities was also common. Forty such projects were awarded, attracting 25% of the investment. Only two channel dredging projects were awarded in 1990–2001.

Toll Roads

Twenty-eight developing economies introduced private activity in toll roads in 1990–2001, awarding 327 projects. Annual investment in toll road projects rose to a peak of \$11.3 billion in 1997, declined in 1998 and 1999, then recovered in 2000 and 2001. Argentina and Mexico accounted for most of the investment in 1990, while China and Brazil did in 1996–98. The Republic of Korea drove most of the recovery in 2001. Over the 12-year period toll roads led private activity in transport, in both investment and number of projects.

Concessions attracted the most investment in toll roads in 1990–2001, with a 51% share, followed by greenfield projects (44%). Most of these projects were awarded in two regions. Latin America and the Caribbean granted 102 concessions, and East Asia and Pacific 89. And East Asia and Pacific granted 41 greenfield projects, and Latin America and the Caribbean 35.

Latin America and the Caribbean dominated investment in toll road projects with private participation, followed by East Asia and Pacific (figure 11.9). But East Asia and Pacific led in number of projects, followed by Latin America and the Caribbean (table 11.12).

The top five countries by investment were China (\$17 billion), Brazil (\$13 billion), the Republic of Korea (\$10 billion), Mexico (\$8 billion), and Malaysia (\$6 billion)—together attracting 72% of the investment in toll road projects with private participation in 1990–2001. When countries are ranked by number of projects, China again tops the list (107 projects), followed by Brazil (36), Mexico (30), India (25), and Argentina (24).

Among segments, highways dominated private activity in toll roads, accounting for 94% of the investment in 1990–2001 (table 11.13). Most of the toll road projects connected major metropolitan areas, where large traffic flows supported the projects' financial viability.

Largest Transport Projects with Private Participation in Developing Countries

Among the 10 largest transport projects with private participation in developing countries in 1990–2001, most were toll road or railway projects—and most were in the largest economies of Latin America and East Asia (see table). The 10 projects captured 18% of the investment in private transport projects during the period.

Top 10 Transport Projects with Private Participation, Developing Countries, 1990–2001

Project	Investment (2001 US\$ billions)	Country
Argentina Airport System	3.9	Argentina
Trenes de Buenos Aires (TBA)	2.7	Argentina
Kimpo Airport Expressway	2.6	Korea, Rep. of
Transportación Ferroviaria Mexicana	2.5	Mexico
Guangzhou-Shenzhen Superhighway	2.5	China
PUTRA-LRT	2.4	Malaysia
Daegu-Pusan Expressway	2.0	Korea, Rep. of
Bangkok Transit System Corp. ^a	2.0	Thailand
Cheonan-Nonsan Expressway	1.9	Korea, Rep. of
Malha Paulista	1.9	Brazil
Total	24.4	

a. Canceled in 1997.

Source: World Bank, PPI Project Database.

Top Sponsors of Transport Projects with Private Participation in Developing Countries

In 1990–2001 the top 10 sponsors of transport projects in developing countries were involved in projects accounting for more than 30% of the investment. Unlike in other infrastructure sectors, in transport most of the top sponsors were companies from developing countries that specialized in the region in which they were based (see table). The only international companies among the top sponsors were Grupo Dragados (Spain) and Società Esercizi Aeroportuali (Italy). This trend reflects the fact that most transport contracts were awarded to consortia of local companies, often operating in other industries, such as construction. The main exceptions were airport projects. Consortia for these projects usually included at least one experienced operator, which most developing countries lacked in the 1990s.

Most of the top sponsors of transport projects concentrated on toll roads, with the exceptions being Hutchison Whampoa (seaports) and Renong (railways). This trend reflects the predominance of toll roads in private activity in transport. Concessions and greenfield projects were the most common types of participation for the top 10 sponsors.

Top 10 Sponsors of Transport Projects with Private Participation, Developing Countries, 1990–2001

Sponsor	Investment ^a (2001 US\$ billions)	Projects	Projects by region					
			East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub- Saharan Africa
ICA SA de CV	5.7	15	0	0	15	0	0	0
Hopewell Holdings	5.2	6	6	0	0	0	0	0
Grupo Tribasa SA de CV	4.9	16	0	0	16	0	0	0
Grupo Dragados	4.8	19	0	0	18	0	0	1
New World Infrastructure	4.3	42	42	0	0	0	0	0
Hutchison Whampoa	4.1	14	12	0	1	0	0	1
Benito Roggio e Hijos SA	4.1	13	0	0	13	0	0	0
Renong Berhad	4.0	3	3	0	0	0	0	0
Odebrecht	3.9	6	0	0	6	0	0	0
Società Esercizi Aeroportuali and Corporacion America SA	3.9	1	0	0	1	0	0	0
Total ^b	41.4	127	63	0	62	0	0	2

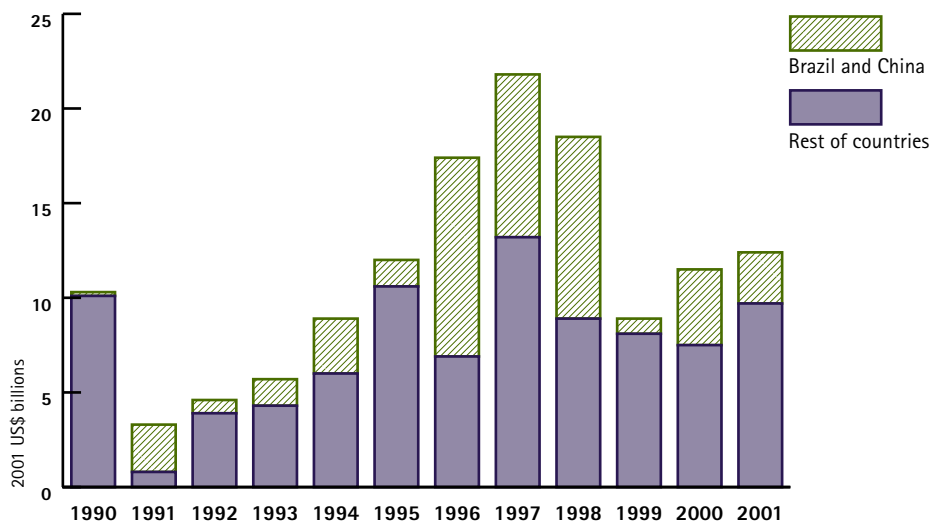
a. Investment from all sources in projects in which sponsor had an equity participation of 15% or more.

b. Data may not sum to totals because projects can be associated with more than one sponsor.

Source: World Bank, PPI Project Database.

Figure 11.1

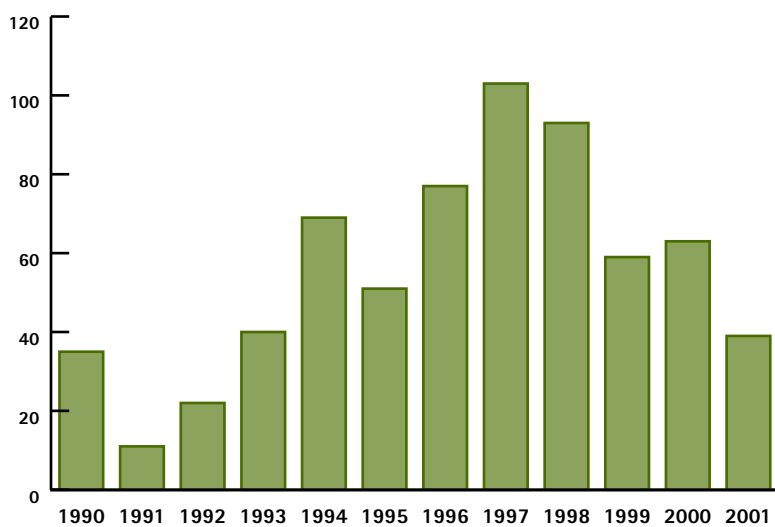
Annual Investment in Transport Projects with Private Participation, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 11.2

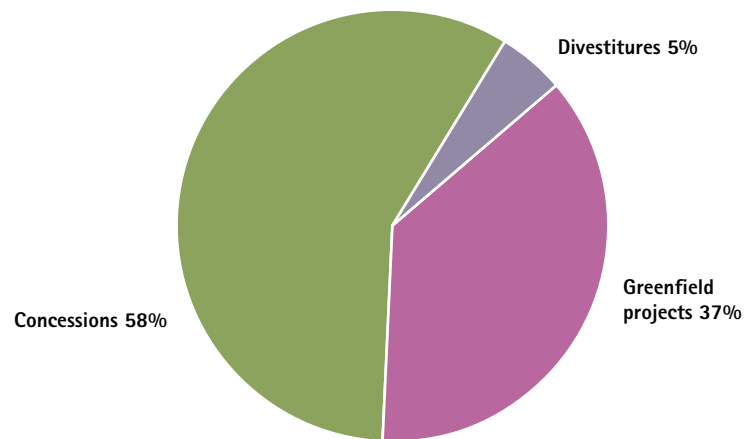
Transport Projects with Private Participation by Year of Financial Closure, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 11.3

Cumulative Investment in Transport Projects with Private Participation by Type, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$135 billion

Table 11.1

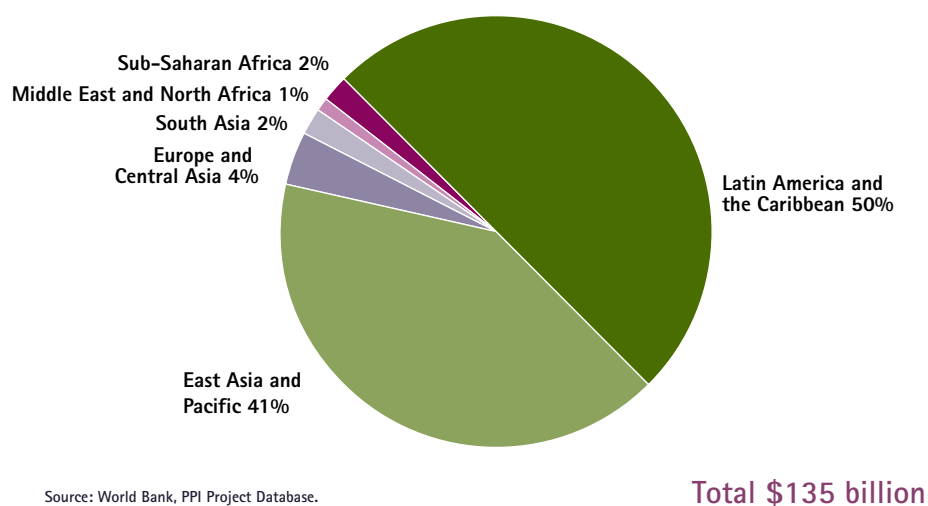
Transport Projects with Private Participation by Type, Developing Countries, 1990–2001

Type of private participation	Projects
Concessions	384
Divestitures	56
Greenfield projects	178
Management and lease contracts	44
Total	662

Source: World Bank, PPI Project Database.

Figure 11.4

Cumulative Investment in Transport Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Table 11.2

Private Participation in Transport by Region, Developing Countries, 1990–2001

Region	Countries	Projects	Investment (2001 US\$ billions)
East Asia and Pacific	10	229	55.7
Europe and Central Asia	10	43	5.1
Latin America and the Caribbean	19	295	67.6
Middle East and North Africa	6	16	1.8
South Asia	4	41	2.4
Sub-Saharan Africa	17	38	2.7
Total	66	662	135.3

Source: World Bank, PPI Project Database.

Table 11.3**Top Five Developing Countries by Cumulative Investment in Transport Projects with Private Participation, 1990–2001**

Country	Investment (2001 US\$ billions)	Investment as a share of developing world total (%)
China	23.6	17
Brazil	21.6	16
Argentina	16.7	12
Mexico	16.2	12
Malaysia	13.9	10
Total	92.1	68

Source: World Bank, PPI Project Database.

Table 11.4**Top Five Developing Countries by Per Capita Cumulative Investment in Transport Projects with Private Participation, 1990–2001**

Country	Per capita investment (2001 US\$)	Total investment (2001 US\$ billions)
Malaysia	582	13.9
Panama	474	1.4
Argentina	445	16.7
Chile	359	5.5
Estonia	222	0.3

Source: World Bank, PPI Project Database.

Table 11.5

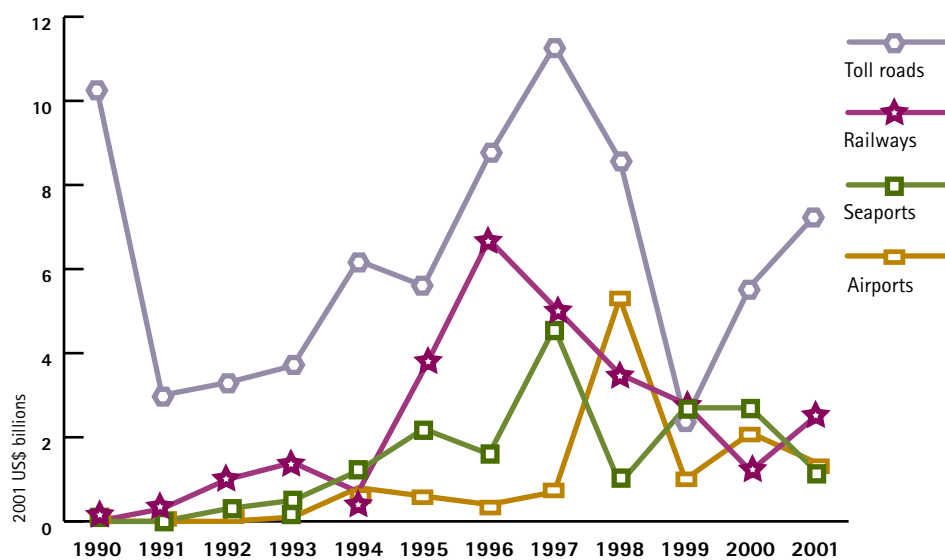
Private Participation in Transport by Subsector, Developing Countries, 1990–2001

Subsector	Projects	Investment (2001 US\$ billions)
Airports	82	12.5
Railways	76	28.8
Seaports	177	18.0
Toll roads	327	76.0
Total	662	135.3

Source: World Bank, PPI Project Database.

Figure 11.5

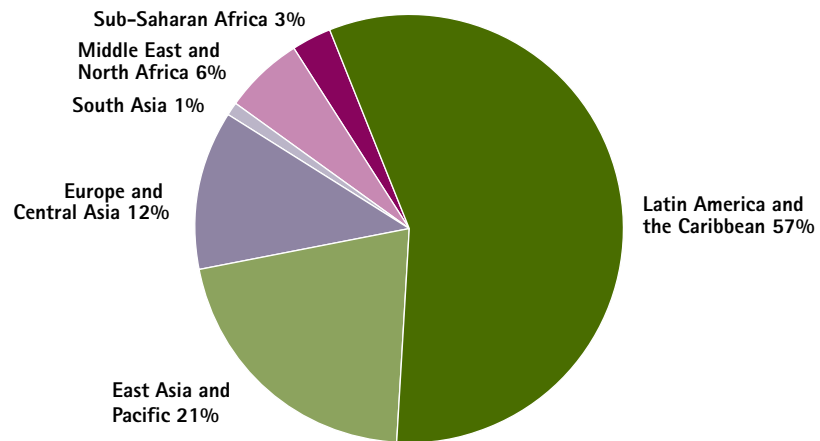
Annual Investment in Transport Projects with Private Participation by Subsector, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 11.6

Cumulative Investment in Airport Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$12 billion

Table 11.6

Private Participation in Airports by Region, Developing Countries, 1990–2001

Region	Countries	Projects
East Asia and Pacific	7	17
Europe and Central Asia	6	14
Latin America and the Caribbean	12	32
Middle East and North Africa	2	7
South Asia	1	2
Sub-Saharan Africa	7	10
Total	35	82

Source: World Bank, PPI Project Database.

Table 11.7

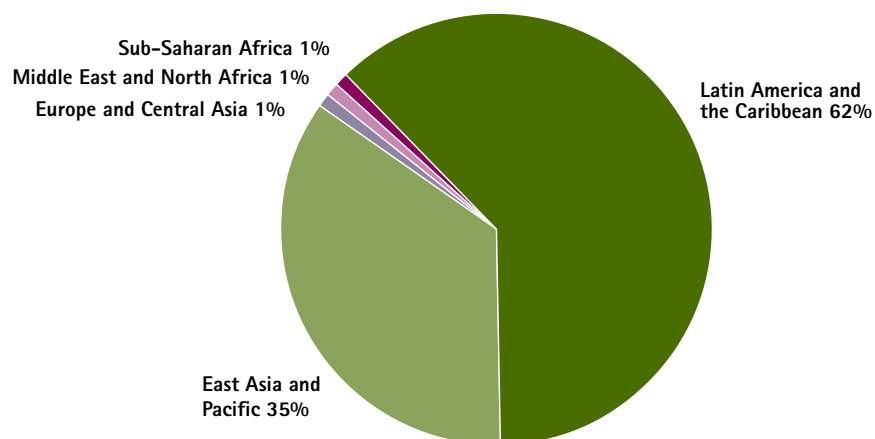
Private Participation in Airports by Segment, Developing Countries, 1990–2001

Segment	Projects	Investment (2001 US\$ billions)
All facilities	54	10.1
Terminals	26	1.9
Runways	2	0.5
Total	82	12.5

Source: World Bank, PPI Project Database.

Figure 11.7

Cumulative Investment in Railway Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$29 billion

Table 11.8**Private Participation in Railways by Region, Developing Countries, 1990–2001**

Region	Countries	Projects
East Asia and Pacific	3	11
Europe and Central Asia	2	7
Latin America and the Caribbean	10	48
Middle East and North Africa	1	1
South Asia	0	0
Sub-Saharan Africa	11	9
Total	27	76

Source: World Bank, PPI Project Database.

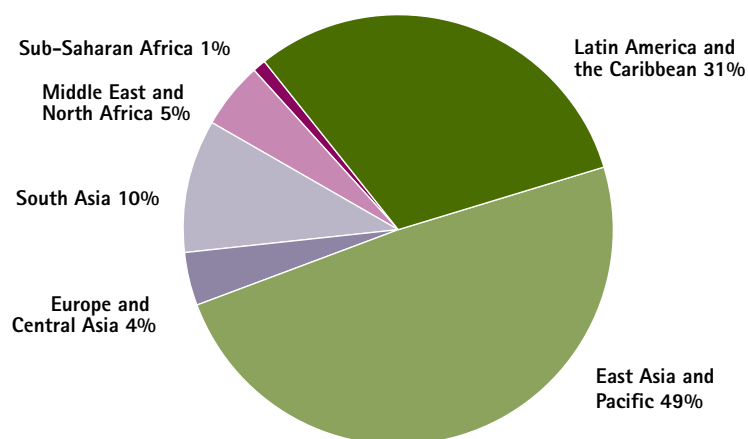
Table 11.9**Private Participation in Railways by Segment, Developing Countries, 1990–2001**

Segment	Projects	Investment (2001 US\$ billions)
Integrated facilities ^a	49	21.1
Freight and passenger	7	0.7
Freight	8	4.3
Passenger	6	2.5
Fixed assets	6	0.2
Total	76	28.8

a. Fixed assets and any rail service (freight or passenger).
Source: World Bank, PPI Project Database.

Figure 11.8

Cumulative Investment in Seaport Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$18 billion

Table 11.10

Private Participation in Seaports by Region, Developing Countries, 1990–2001

Region	Countries	Projects
East Asia and Pacific	8	52
Europe and Central Asia	5	16
Latin America and the Caribbean	13	78
Middle East and North Africa	5	8
South Asia	3	13
Sub-Saharan Africa	7	10
Total	41	177

Source: World Bank, PPI Project Database.

Table 11.11

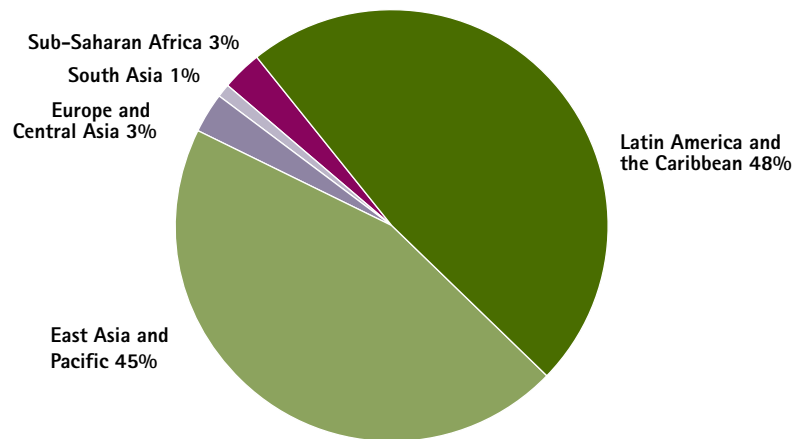
Private Participation in Seaports by Segment, Developing Countries, 1990–2001

Segment	Projects	Investment (2001 US\$ billions)
Container terminals	83	11.3
Dry bulk terminals	26	1.1
Multipurpose terminals	12	0.3
Liquid bulk terminals	14	0.7
Channel dredging	2	0.1
All facilities	40	4.6
Total	177	18.0

Source: World Bank, PPI Project Database.

Figure 11.9

Cumulative Investment in Toll Road Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$76 billion

Table 11.12**Private Participation in Toll Roads by Region, Developing Countries, 1990–2001**

Region	Countries	Projects
East Asia and Pacific	6	149
Europe and Central Asia	3	6
Latin America and the Caribbean	13	137
Middle East and North Africa	0	0
South Asia	2	26
Sub-Saharan Africa	4	9
Total	28	327

Source: World Bank, PPI Project Database.

Table 11.13**Private Participation in Toll Roads by Segment, Developing Countries, 1990–2001**

Segment	Projects	Investment (2001 US\$ billions)
Highways	271	71.4
Bridges	32	2.0
Tunnels	2	0.2
Highways and bridges	19	2.3
Highways and tunnels	2	0.1
Highways, tunnels, and bridges	1	0.0
Total	327	76.0

Source: World Bank, PPI Project Database.

12 Water and Sewerage

Private activity in water and sewerage grew significantly in 1990–2001 as 43 developing countries awarded 203 projects with private participation, attracting investment commitments of almost \$40 billion.

Annual investment in water and sewerage projects with private participation fluctuated strongly over the 12-year period (figure 12.1). A few transactions explained the peaks, such as the concession of the water utility in the city of Buenos Aires, Argentina, in 1993; that of the utility in Manila, Philippines, in 1997; and the privatization of the largest water utilities in Chile in 1999. The number of projects rose gradually to a peak in 1999, then fell (figure 12.2).

Although private participation in infrastructure was spread among a large number of projects and sponsors in the region, the biggest projects and the top sponsors accounted for most of the investment commitments (boxes 12.1 and 12.2).

Introducing private participation has been more difficult in water and sewerage than in other infrastructure sectors because of broad resistance to raising tariffs to cost-recovering levels, which increases the risk of long-term investment in sector assets. Another factor has been decentralization. In most countries water and sewerage services are under the jurisdiction of local or provincial governments, which often have little experience with private participation in infrastructure.

Concessions dominated private activity in water and sewerage, reflecting the focus on transferring management of existing assets to the private sector while keeping legal ownership of those assets in the public sector (figure 12.3; table 12.1). Concessions of water utilities have been attractive to governments because they transfer operational and investment responsibilities—as well as the associated commercial and investment risk—to the private sector. Because these transactions involve private investment in distribution as well as bulk supply, they maximize potential efficiency gains. But they also require substantial government commitment and efforts to create a credible regulatory environment for private investment. Greenfield projects, mainly for constructing bulk water treatment facilities, were the second most common type of private participation in the sector. Most of the concessions and greenfield projects were awarded in Latin America and the Caribbean (83 projects) and East Asia and Pacific (46).

Management and lease contracts were also common, accounting for 20% of water and sewerage projects. Such contracts were intended to improve the performance of public utilities while leaving the public sector primarily responsible for new investments. Management and lease contracts have been attractive in countries where the private sector perceived investment risk as particularly high or where investment requirements for network expansion were small and emphasis was placed on improving efficiency. Management and lease contracts were awarded mainly in Europe and Central Asia (21 projects) and Sub-Saharan Africa (7).

Latin America and the Caribbean had the most private activity in water and sewerage, followed by East Asia and Pacific (figure 12.4; table 12.2). The growth of the sector in these two regions coincides with the opening of other infrastructure business to the private sector and, particularly in Latin America, progress toward establishing legal and regulatory institutions that promote private participation.

In Europe and Central Asia, the third most active region, private activity in the sector was focused on management and lease contracts. But most of the investment went to a few concessions. In Sub-Saharan Africa private activity was limited mostly to management and lease contracts.

The Middle East and North Africa had a small but growing amount of private involvement in water and sewerage. In addition to four water projects, three projects involving water and electricity utilities were awarded in the region, including the large Casablanca concession in Morocco. In South Asia private activity in the sector started in 2000 with one greenfield contract for a water system in a new industrial area in India.

Private activity steadily spread across countries in 1990–2001, though investment remained fairly concentrated (figure 12.5). In the early 1990s two countries accounted for 100% of the annual investment in water and sewerage projects involving the private sector, while in 2001 the top five countries captured 75%. Over the 12-year period the five attracting the most investment were Argentina, the Philippines, Malaysia, Chile, and Brazil (table 12.3). When investment is expressed in per capita terms, however, smaller economies—Uruguay and Trinidad and Tobago—move into the top five (table 12.4). The main water project with private participation in Uruguay was the water and sewerage concession for the province of Maldonado, while in Trinidad and Tobago it was a desalination treatment plant. Brazil led in projects (32), followed by China (24), Mexico (21), the Czech Republic (16), and Argentina (12).

Among segments, the 75 projects involving vertically integrated water and sewerage utilities (potable water and sewerage networks) dominated investment (figure 12.6; table 12.5). In addition, 28 projects involving vertically integrated water companies (excluding sewerage services) were awarded to private operators during the period.

The preference for awarding integrated water utilities reflected government objectives in the sector. Water utilities in most developing countries not only faced a need to expand capacity and distribution networks but also had high levels of inefficiency and unaccounted-for water. Projects detaching the expansion of network capacity from the management of distribution networks can exacerbate system inefficiencies (for example, expanding water treatment capacity can increase unaccounted-for water by raising water pressure in the network). Because concessions of vertically integrated water utilities encourage better management and maintenance of the entire network, they are usually more effective in tackling sector problems than projects dealing with a specific part of the network.

Second most common were projects involving stand-alone potable water treatment plants. The 33 such projects were implemented through greenfield contracts with state-owned utilities. Eight stand-alone water distribution projects were awarded. Stand-alone sewerage projects were also awarded, most of them in countries with the well-developed water infrastructure and increasing wealth needed for municipal governments to extend sewerage services. But stand-alone sewerage plants were rare, perhaps because of the difficulty of unbundling sewerage services from water supply: sewerage requires water, and sewerage services cannot be cut off for nonpayment without also cutting off water supply.

The other 29 projects bundled water and sewerage services in different ways. Most common among these were contracts involving water distribution and sewage collection (14 projects).

Box 12.1

Largest Water and Sewerage Projects with Private Participation in Developing Countries

Among the 10 largest water and sewerage projects with private participation in developing countries in 1990–2001, most involved vertically integrated water utilities in Latin America and the Caribbean and East Asia and Pacific (see table). These projects accounted for 56% of the investment in private water and sewerage projects during the period.

Top 10 Water and Sewerage Projects with Private Participation, Developing Countries, 1990–2001

Project	Investment (2001 US\$ billions)	Country
Aguas Argentinas	4.9	Argentina
Manila Water and Wastewater (west zone)	4.4	Philippines
Indah Wastewater Urban Sewerage ^a	2.9	Malaysia
Empresa Metropolitana de Obras de Santiago de Chile (EMOS)	2.5	Chile
Manila Water and Wastewater (east zone)	1.9	Philippines
Sabah Water Supply	1.6	Malaysia
Aguas Provinciales de Santa Fe	1.2	Argentina
Izmit Water Supply Project	1.1	Turkey
Bucharest Water	1.0	Romania
Buenos Aires Province Water and Sewerage ^b	1.0	Argentina
Total	22.4	

a. Canceled in 2000.

b. Canceled in 2001.

Source: World Bank, PPI Project Database.

Top Sponsors of Water and Sewerage Projects with Private Participation in Developing Countries

A few major companies dominate private participation in water and sewerage in developing countries. The top five in 1990–2001 accounted for 45% of the private projects in the sector, and these projects for 64% of the investment during the period (see table). These top five were involved mainly in concessions (30 projects) and management or lease contracts (27), more rarely in greenfield projects (17) and divestitures (7).

Many contracts were awarded to consortia made up of local companies (often operating in other industries) and one or two experienced international companies. A breakdown of the major players by region highlights the predominance of international companies. Except for Benpres Holdings, the top sponsors were international players operating in several regions.

Top Five Sponsors of Water and Sewerage Projects with Private Participation, Developing Countries, 1990–2001

Sponsor	Investment ^a (2001 US\$ billions)	Projects	Projects by region					
			East Asia and Pacific	Europe and Central Asia	Latin America and the Caribbean	Middle East and North Africa	South Asia	Sub- Saharan Africa
SUEZ	18.1	44	16	14	10	2	0	2
Sociedad General de Aguas de Barcelona	10.6	14	0	0	14	0	0	0
Benpres Holdings	4.4	2	2	0	0	0	0	0
Thames Water	3.3	13	8	2	3	0	0	0
Vivendi	3.1	25	5	11	6	1	0	2
Total ^b	25.5	91	29	27	28	3	0	4

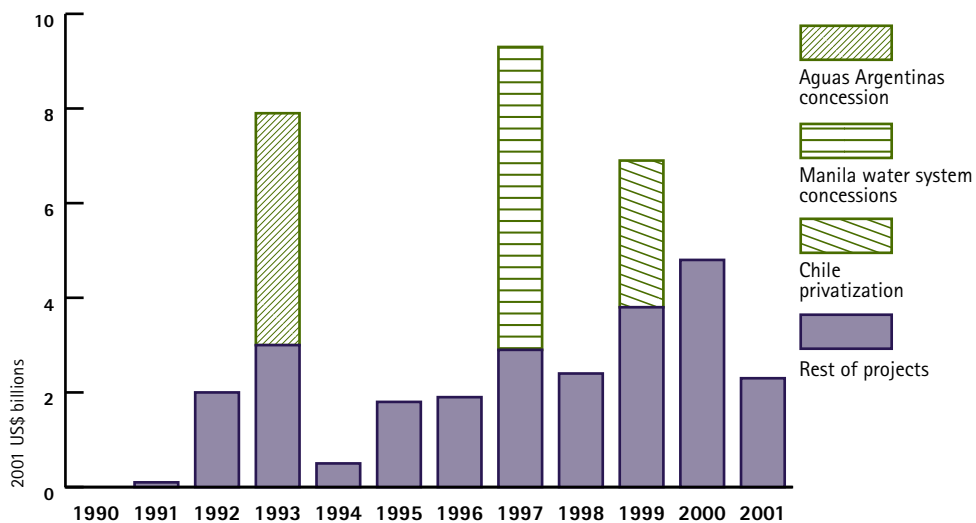
a. Investment from all sources in projects in which sponsor had an equity participation of 15% or more.

b. Data may not sum to totals because projects can be associated with more than one sponsor.

Source: World Bank, PPI Project Database.

Figure 12.1

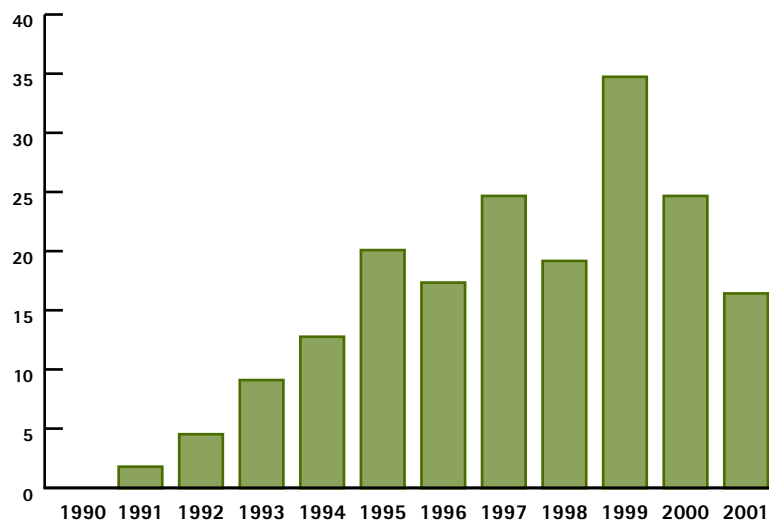
Annual Investment in Water and Sewerage Projects with Private Participation, Developing Countries, 1990–2001*



* Note: Data refer to investment commitments.
Source: World Bank, PPI Project Database.

Figure 12.2

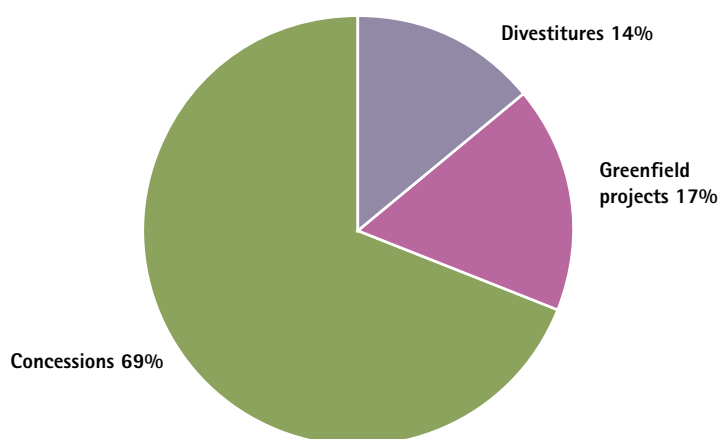
Water and Sewerage Projects with Private Participation by Year of Financial Closure, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Figure 12.3

Cumulative Investment in Water and Sewerage Projects with Private Participation by Type, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$40 billion

Table 12.1

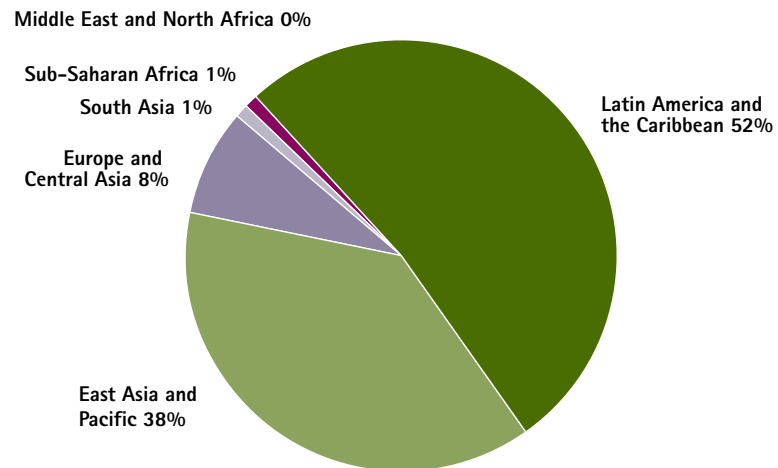
Water and Sewerage Projects with Private Participation by Type, Developing Countries, 1990–2001

Type of private participation	Projects
Concessions	90
Divestitures	16
Greenfield projects	56
Management and lease contracts	41
Total	203

Source: World Bank, PPI Project Database.

Figure 12.4

Cumulative Investment in Water and Sewerage Projects with Private Participation by Region, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Total \$40 billion

Table 12.2

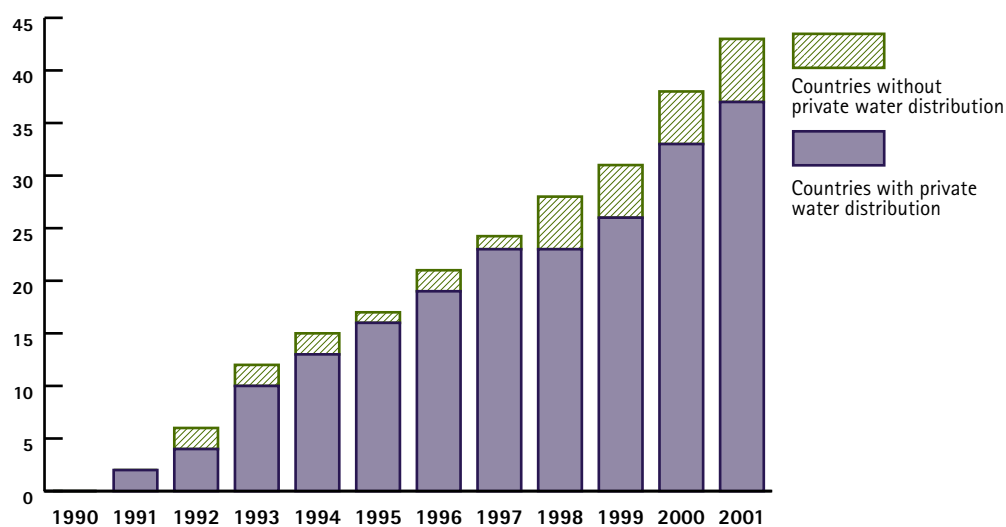
Private Participation in Water and Sewerage by Region, Developing Countries, 1990–2001

Region	Countries	Projects	Investment (2001 US\$ billions)
East Asia and Pacific	7	51	15.3
Europe and Central Asia	12	37	3.3
Latin America and the Caribbean	15	100	20.7
Middle East and North Africa	3	4	0.1
South Asia	1	1	0.2
Sub-Saharan Africa	5	10	0.2
Total	43	203	39.8

Source: World Bank, PPI Project Database.

Figure 12.5

Cumulative Number of Developing Countries with Private Participation in Water and Sewerage, 1990–2001



Source: World Bank, PPI Project Database.

Table 12.3

Top Five Developing Countries by Cumulative Investment in Water and Sewerage Projects with Private Participation, 1990–2001

Country	Investment (2001 US\$ billions)	Investment as a share of developing world total (%)
Argentina	9.6	24
Philippines	6.4	16
Malaysia	6.1	15
Chile	4.2	11
Brazil	3.1	8
Total	29.4	74

Source: World Bank, PPI Project Database.

Table 12.4

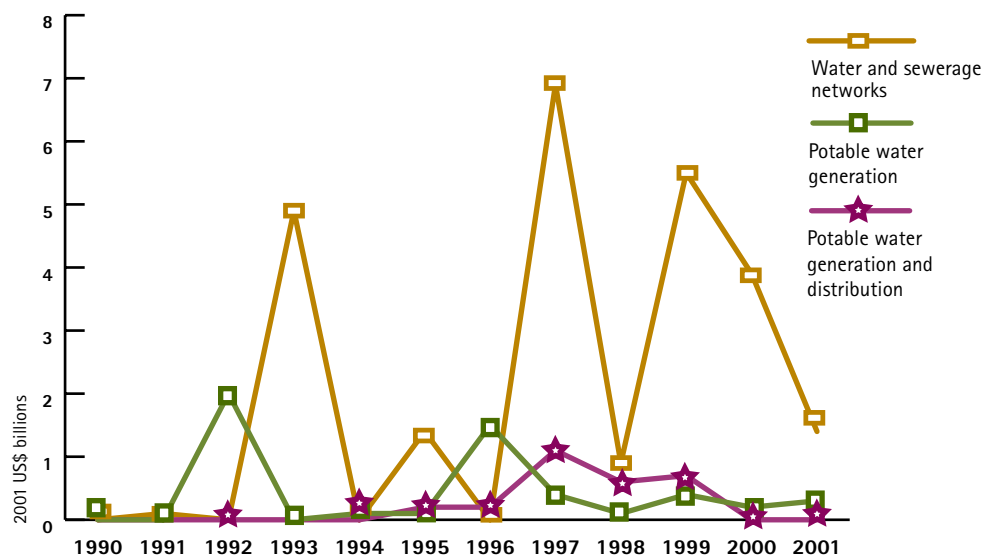
Top Five Developing Countries by Per Capita Cumulative Investment in Water and Sewerage Projects with Private Participation, 1990–2001

Country	Per capita investment (2001 US\$)	Total investment (2001 US\$ billions)
Chile	271	4.2
Malaysia	257	6.1
Argentina	255	9.6
Uruguay	111	0.4
Trinidad and Tobago	94	0.1

Source: World Bank, PPI Project Database.

Figure 12.6

Annual Investment in Water and Sewerage Projects with Private Participation by Segment, Developing Countries, 1990–2001



Source: World Bank, PPI Project Database.

Table 12.5

Private Participation in Water and Sewerage by Segment, Developing Countries, 1990–2001

Segment	Projects	Investment (2001 US\$ billions)
Potable water and sewerage networks	75	25.1
Potable water treatment	33	5.2
Water treatment and distribution	28	2.9
Sewage collection and treatment	10	0.4
Sewage treatment	20	3.1
Water distribution	8	0.0
Others	29	3.0
Total	203	39.8

Source: World Bank, PPI Project Database.