CHAPTER ONE

# The New Paradigm for Network Utilities

FOR MUCH OF THE 20TH CENTURY MOST COUNTRIES relied on government ownership and regulation to promote socially equitable access to network infrastructure services—including electricity, telecommunications, water and sewerage, natural gas, and transportation—using mechanisms such as nonexploitive pricing, nondiscriminatory coverage, and universal service.[1] Reflecting infrastructure's strategic importance and concerns about monopoly power, it was widely believed that these sectors could not be entrusted to the signals, motivations, and penalties of free markets. In addition, most governments relied on this public utility paradigm because they were convinced that state resources were required to finance large investments in service coverage.

But in recent decades this consensus has changed, resulting in far-reaching restructuring, privatization, and other reforms of crucial infrastructure sectors and services. This chapter explains why—and explores what this change bodes for future efforts to regulate and expand infrastructure.

## Why Are Network Utilities So Important?

NETWORK UTILITIES PROVIDE CRUCIAL SERVICES FOR MANUfacturing and commerce, and so significantly influence the growth of national production (World Bank 1994b; Newbery 2000a). Thus economic development depends on such infrastructure—and failure to reform and modernize it undermines national competitiveness and risks economic stagnation.

**Deficient infrastructure—along with weak management and poor economic organization—accounts for a large share of low factor productivity in developing countries**

This report's focus on the regulation of network utilities is also motivated by their unique economic characteristics, which make them a natural target for government intervention yet render them difficult to regulate in the public interest. These characteristics include (Spiller and Savedoff 1999):

- Extensive economies of scale and scope that generally lead to market concentration and inhibit competition. As a result regulation cannot be completely abolished.
- Large sunk costs relative to fixed and variable (avoidable) costs. Sunk costs are those that in the short- and medium-term cannot be eliminated even by ceasing production. Such costs impose considerable risks and so discourage entry by new service providers.
- Services deemed essential to a broad range of users, making their provision and pricing politically sensitive.

Extensive economies of scale and scope often lead to monopolistic organization of network utilities.[2] Large sunk costs exacerbate the problem of market power and ensure that private, unregulated pricing and investment decisions will not be socially optimal. The combination of large, durable assets with significant sunk costs and highly politicized consumption makes network utilities vulnerable to administrative expropriation—both directly and through uneconomic price controls. Because private investors feel vulnerable, they reduce their investments, demand high risk premiums, or both (Zelner and Henisz 2000). These basic features, common to varying degree to utilities across different sectors, create special challenges for effective regulation.

## From State to Market—Changing Views on Utilities

AFTER WORLD WAR II THE VERTICALLY INTEGRATED, STATE-owned utility became the industry model for electricity, telecommunications, water, natural gas, and railways and other transportation services. In electricity, for example, the same publicly owned company was often responsible for generating power, transmitting it to local networks, and distributing it to retail consumers.

Unlike previously private utilities that were highly fragmented or too large to prevent monopolistic abuse, publicly owned entities seemed

like a sensible way to secure the benefits of size—and the required large-scale financing—without suffering the drawbacks of monopoly pricing. Thus most countries opted for nationalization instead of regulation. An exception was the United States, where network utilities were privately owned but subject to comprehensive regulatory controls. Still, industrial structures were quite similar under these two forms of ownership and regulation (Newbery 2002).

At first, vertically integrated, state-owned utilities produced reasonably satisfactory results (Fare, Grosskopf, and Logan 1985). For example, French and U.K. public firms became leaders in efficient utility pricing starting in the 1950s (Turvey 1968). In the United States the Tennessee Valley Authority demonstrated the advantages of reaching down the demand curve by reducing prices (Scherer 1980, p. 487). And Brazil's state-owned telecommunications company, Telebras, grew impressively after it was consolidated and restructured in 1972 (World Bank 1992).

Since the early 1980s, however, the monolithic model has proven increasingly unsuited to dramatically changing conditions in both industrial and developing countries. As a result there has been a worldwide reassessment of public policies for network utilities.

This reassessment began in the late 1970s, when the United States initiated wide-ranging regulatory reforms (Joskow and Noll 1994; Noll 1999). Revolutionary changes in U.S. economic policies and network utilities were driven by a series of serious challenges—including stagflation, energy crises, double-digit inflation, increased environmental concerns, the bankruptcy of backbone industries (such as railways), and a perceived erosion in national productivity and international competitiveness (box 1.1). Proponents of deregulation argued that unleashing competition among service providers would lower inflation and restore productivity growth. At the same time, concerns about the energy crises and environmental protection facilitated the introduction of economically efficient pricing, which was expected to discourage wasteful consumption (Kahn 2001).

During the same period the United Kingdom began transforming major sectors of its economy. Large-scale privatization began in 1984, when 51 percent of British Telecom was sold to the private sector. The company's divestiture was driven by the government's desire to remove telecommunications investment from its balance sheet in order to meet its targets for public borrowing (Kay 2001). The subsequent privatiza-

## Box 1.1 Milestones in Infrastructure Reform in the United States, the United Kingdom, and the European Union

| | |
|---|---|
| *U.S. deregulation* | |
| Airline Deregulation Act | 1978 |
| Staggers Act (rail deregulation) | 1980 |
| Motor Carrier Act (trucking deregulation) | 1980 |
| AT&T divestiture (telecommunications deregulation) | 1984 |
| Federal Energy Regulatory Commission Order 636 (gas deregulation) | 1992 |
| FERC Order 888 (electricity deregulation) | 1996 |
| Telecommunications Act | 1996 |
| *U.K. privatization* | |
| British Telecom | 1984 |
| British Gas | 1986 |
| British Airways | 1987 |
| British Airports Authority | 1987 |
| Water and sewage companies | 1989 |
| Electricity companies | 1990 |
| British Rail | 1995 |
| British Energy (nuclear) | 1996 |
| *EU liberalization directives* | |
| Telecommunications | 1990 |
| Railways | 1991 |
| Electricity | 1996 |
| Gas | 1998 |

tion of other utility industries was accompanied by radical regulatory reforms (Newbery 2000a). Several new regulatory bodies were created, and new tasks were assigned to existing agencies such as the Monopolies and Mergers Commission (Armstrong, Cowan, and Vickers 1994).

Meanwhile, members of the European Union increasingly came to see state-owned monopolies as hindrances to international trade in goods and services. Thus in the 1990s a series of directives were issued to create a single market where goods, services, people, and capital could move freely. These directives spelled out rules for telecommunications,

**Table 1.1 Private Investment in Infrastructure in Developing and Transition Economies, by Sector, 1990–2001**

*(billions of 2001 U.S. dollars)*

| Year | Telecommunications | Electricity | Transportation | Water | Gas | Total |
|---|---|---|---|---|---|---|
| 1990 | 6.2 | 1.3 | 10.3 | — | — | 17.8 |
| 1991 | 13.5 | 1.3 | 3.3 | 0.1 | — | 18.2 |
| 1992 | 7.9 | 8.9 | 4.6 | 2.0 | 4.0 | 27.4 |
| 1993 | 10.9 | 11.1 | 5.7 | 7.9 | 4.6 | 40.2 |
| 1994 | 20.3 | 15.2 | 8.9 | 0.5 | 1.8 | 46.7 |
| 1995 | 20.1 | 20.9 | 12.0 | 1.8 | 4.1 | 58.9 |
| 1996 | 29.7 | 30.6 | 17.4 | 1.9 | 3.0 | 82.6 |
| 1997 | 45.4 | 48.7 | 21.7 | 9.3 | 3.3 | 128.4 |
| 1998 | 57.3 | 24.6 | 18.4 | 2.4 | 6.5 | 109.2 |
| 1999 | 43.3 | 14.4 | 8.9 | 6.9 | 3.7 | 77.2 |
| 2000 | 45.3 | 26.4 | 11.6 | 4.8 | 2.3 | 90.4 |
| 2001 | 31.7 | 10.0 | 12.4 | 2.2 | 1.2 | 57.5 |
| Total | 331.6 | 213.4 | 135.2 | 39.8 | 34.5 | 754.5 |

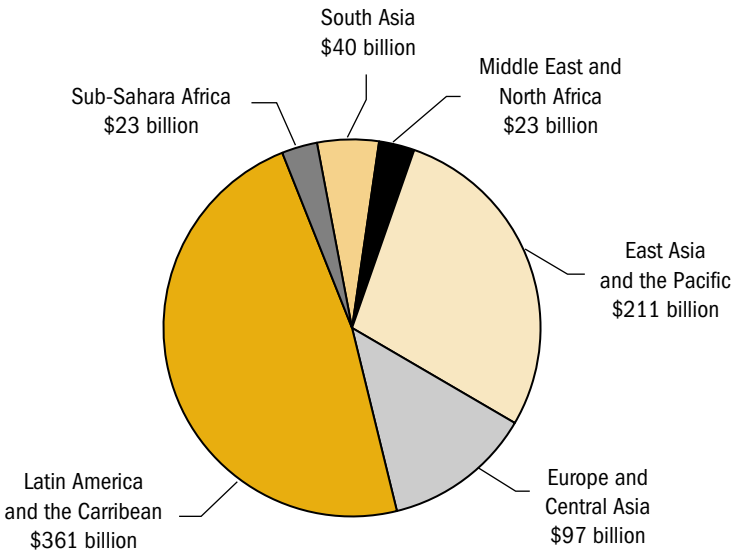
*Source:* World Bank, Private Participation in Infrastructure Project database.

railways, electricity, and natural gas markets across EU member states, mapping out a common regulatory framework and liberalizing these industries. But little thought was given to the challenges of industrial restructuring or the details of policy implementation, and there was no careful assessment of the costs and benefits of these reforms.

As the United States deregulated, the United Kingdom restructured and privatized, and the European Union issued directives calling for extensive liberalization (but staying silent on the issue of ownership) and building a single market, a powerful privatization movement began sweeping developing and transition economies. Between 1990 and 2001, 132 of these countries took substantive steps to introduce private participation in their infrastructure sectors. During this period these countries saw $750 billion in private investment in infrastructure through divestitures, greenfield projects, and management and operations contracts involving major capital spending (table 1.1).

For many developing countries the primary push for privatization came from the debt and fiscal crises of the early 1980s (Estache 2001). Another major impetus came from the extraordinarily weak performance of infrastructure in these countries relative to industrial countries.[3] Similar reasons motivated reforms in transition economies start-

**Figure 1.1 Latin America and the Caribbean Has Led Developing Regions in Private Investment in Infrastructure, 1990–2001**




*Source:* Harris (2003).

ing in the early 1990s. Heavy debt burdens forced many countries to make fiscal adjustments that hit public investment in infrastructure especially hard. For example, in Latin America between 1980–84 and 1995–98 public infrastructure investment as a share of GDP dropped from 3.1 to 0.2 percent in Argentina, from 5.0 to 2.0 percent in Bolivia, from 3.7 to 0.6 percent in Brazil, from 3.1 to 1.7 percent in Chile, from 2.5 to 0.4 percent in Mexico, and from 2.0 to 0.6 percent in Peru (Calderon, Easterly, and Serven 2003). Yet in recent years Latin America and the Caribbean has led developing regions in infrastructure investment involving private participation (Roger 1999; Izaguirre 2002)—accounting for nearly half the total in 1990–2001, mainly through divestitures (figure 1.1).

Privatization was also spurred by the intolerable damage caused by mismanagement of public enterprises (Shirley and Walsh 2001). Most such entities pursued multiple, poorly defined, conflicting objectives, with managers often appointed based on their political loyalty, not competence. Investment funds were frequently squandered on poor projects.

Moreover, price controls were imposed without regard for their performance implications, subjecting enterprises to financial distress and impairing their ability to mobilize investments and provide reliable services (Kerf and Smith 1996).

Efforts to reform unproductive public enterprises had limited success, either failing to achieve or sustain desired improvements (World Bank 1995). Few governments were able to implement and maintain the many complex, demanding policies needed for efficient public enterprise performance. Moreover, in many countries inefficient public enterprises—especially in infrastructure—were draining state budgets, diverting resources from other social priorities (such as health and education), impairing the performance of banks, and impeding private sector development.

In a globalized economy, poorly performing state-owned infrastructure providers were increasingly seen as constraining economic growth and undermining international competitiveness. Developing countries simply could not continue to absorb the fiscal burden of these enterprises (Lieberman 1997). Around the world, it became evident to policymakers that the problems of public enterprises could be solved only by implementing radical structural changes and realigning the roles of the government and the private sector.

## The Dawn of a New Utility Model

THE INFRASTRUCTURE LIBERALIZATION AND PRIVATIZATION that swept the globe in the 1990s were a significant departure from the previous economic consensus. This departure not only questioned the need for state ownership in these sectors, it also reexamined long-standing notions about natural monopolies and accompanying regulations.

### Unbundling—Isolating Monopoly Parts

The historical model of network utilities was premised on the assumption that natural monopoly in some areas of their operations, combined with complementarities and coordination requirements between the natural monopoly and other components, meant that these industries

were best served—and served best—when structured as vertically integrated monopolies. Moreover, monopoly franchises seemed to provide an assured base for financing long-term investments. This view was enshrined in the monolithic organization, where a single entity controlled all facilities, operations, and administrative functions and was obliged (in accordance with its public utility responsibilities) to serve on demand within its territory.

**The monopoly approach to supplying services, which dominated infrastructure markets for almost a century, is now in decline**

In recent years, however, there has been growing recognition that network utilities are not monolithic natural monopolies. Rather, they encompass several distinct activities with entirely different economic characteristics—entailing a mix of competition and monopoly elements in supply. Technological progress (which has proven a potent enemy of natural monopolies; Klein 1996a), along with the high costs of regulatory intervention, have been continuously undermining the public utility concept.[4] As a result it has become widely accepted that the vertically integrated monopoly model no longer applies to all network utilities.

Electricity, natural gas, telecommunications, railways, and water evolved as vertically integrated industries with transportation, transmission, and distribution networks linking upstream production to downstream supply. These networks consist of transmission links in electricity, national pipelines and regional distribution links in gas, transmission media and switching centers in telecommunications, earthworks, track, signals, and stations in railways, and pipes and sewers in water. Most network components involve substantial fixed costs that are largely sunk because their assets are of minimal value for other purposes.

But some components of these industries have cost conditions more conducive to competition, including activities related to upstream production and downstream supply (electricity, gas, water), certain parts of the network (interexchange services in telecommunications), and the operation of services on the physical network (railways; Gray and Klein 1997). Although these activities involve important economies of scale and some sunk costs, they are small relative to those in network infrastructure—and are constantly being shrunk by advances in technology. Thus substantial competition could emerge in many parts of these industries (table 1.2).

Reflecting these developments, a new paradigm has emerged for the organizational restructuring of network utilities. According to this model:

**Table 1.2 Noncompetitive and Competitive Components of Network Industries**

| Industry | Activities that are usually not competitive | Activities that can be and sometimes are competitive |
|---|---|---|
| Electricity | High-voltage transmission and local distribution | Generation and supply to final customers |
| Gas | High-pressure transmission and local distribution | Production, supply to final customers, and storage |
| Telecommunications | Local residential telephony or local loop | Long-distance, mobile, and value added services |
| Railways | Short-haul track and signaling infrastructure | Train operations and maintenance facilities |
| Water | Local distribution and local wastewater collection | Production, long-distance transportation, purification, and sewage treatment |
| Air services | Airport facilities | Aircraft operations, maintenance facilities, and commercial activities |

*Source:* Gonenc, Maher, and Nicoletti (2001).

- Network utilities should be unbundled both horizontally and vertically, with different owners for potentially competitive components and natural monopoly components.
- For competitive or structurally contestable activities, government interference with market mechanisms and restrictions on ownership should be relaxed, and the scope for introducing competition through horizontal fragmentation should be fully exploited.
- Only components involving unavoidable natural monopolies or substantial sunk capital should be placed under regulation and perhaps even operated by the public sector (Guasch and Blitzer 1993).

## Competition for the Market—A Promising Old Idea

Some analysts have questioned the need to regulate, at least extensively, the natural monopoly components of infrastructure industries by distinguishing between competition *in* the market and competition *for* the

market. Proponents of this view have resurrected an old yet powerful idea: when a large number of firms submit noncollusive bids to become the supplier of a natural monopoly activity, the resulting price need not reflect exploitive market power (Demsetz 1968).

Thus, even when competition in the market is not feasible, some of its benefits can be achieved by introducing competition for the market. Under this approach monopoly franchises are awarded through competitive bidding and periodically rebid. This approach provides incentives for firms to perform well to retain their franchises (Klein and Roger 1994).

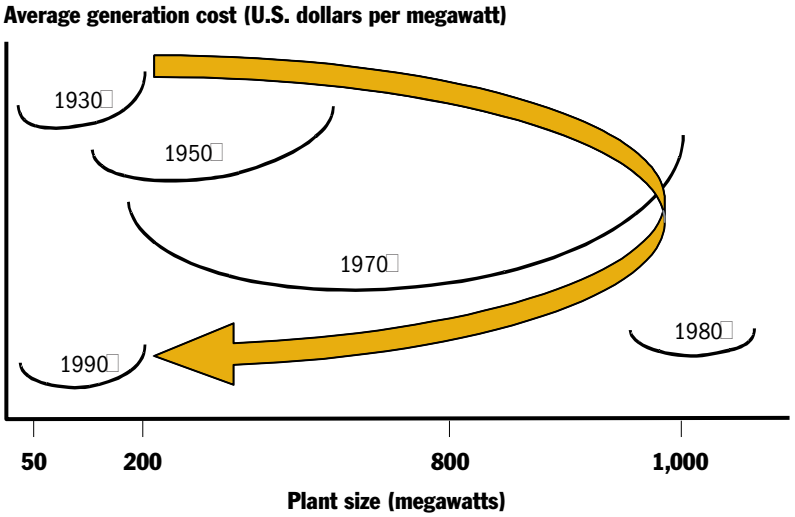
Still, franchising has some serious limitations. Bidding might be uncompetitive. Another difficulty involves contract specification and monitoring: complex products or services often lead to incomplete contracts and opportunistic renegotiations. Thus the idea that competition for the market can eliminate the need for regulation has been disputed. Moreover, case studies indicate that franchise bidding is beset with transactional difficulties—and the institutional infrastructure required to monitor contracts and avoid undesirable outcomes has many of the earmarks of regulation (Williamson 1976).

### Technological Change—Breaking Down Monopoly Barriers

Technological innovation is increasingly driving the move toward competition in network utilities. Changes in production and distribution technologies have had especially dramatic effects on the market structure of the electricity and telecommunications industries.

In electricity new technologies have significantly reduced the minimum efficient scale of generating plants, the investment costs of new units, and the time needed to plan and build new plants (figure 1.2; for more details see chapter 3 and the references cited there). Generation could be structurally competitive in many developing and transition economies, especially those with access to natural gas. Smaller plants considerably increase the range of ownership options. Moreover, low-cost, small-scale generation units allow electric power to be produced closer to end users, reducing reliance on transmission and even distribution networks and undermining their natural monopoly characteristics as well. Small-scale, off-grid supply may ultimately prove a practical solution to the electricity problems of many low-income developing countries, especially in Africa.

**Figure 1.2 The Optimal Size of Power Generating Plants Has Shrunk**




*Source:* Bayless (1994).

The telecommunications industry has experienced revolutionary changes as a result of advances in microelectronics, optoelectronics, fixed and mobile Internet platforms, and a plethora of other new technologies (box 1.2). These innovations have radically altered the industry's cost structure and resulted in large, continuous increases in productivity.

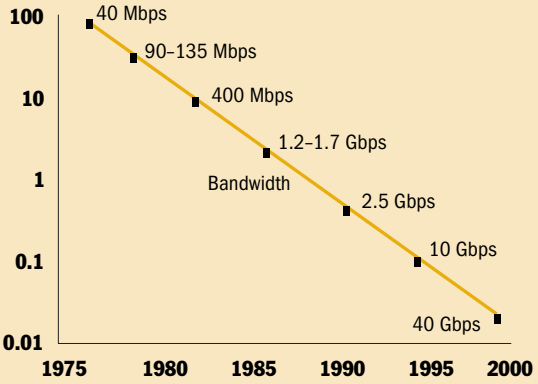
Technology has intensified competition in many components of telecommunications networks. New entrants account for a growing share of global investment in telecommunications, rising from 24 percent in 1996 to 34 percent in 2000 (Siemens 2001). Technological change has almost eliminated natural monopoly in interexchange markets, as seen in several countries. Although the erosion of natural monopoly has been slower in local exchange service, significant competition has also emerged in this segment (Vogelsang and Mitchell 1997; Laffont and Tirole 2000; Woroch 2002).

The rapid growth of cellular telephones—which increasingly substitute for wireline services—has played a big role in reducing the importance of scale and natural monopoly associated with conventional local loops (figure 1.3). In its early stages, wireless technology was marketed as a premium product that delivered mobility and connectivity and was more expensive than wireline technology. As such, it mostly supplemented basic telephony.

## Box 1.2 The Technological Revolution in Telecommunications

TECHNOLOGICAL CHANGE HAS HAD A MASSIVE but uneven effect on telecommunications. Costs have fallen sharply in the industry's long-distance and traffic-sensitive segments, reflecting advances in microwave, satellite, and optoelectronic technology. The impact of optoelectronics has been especially impressive: in just a decade, optical systems have vastly outperformed coaxial cables and fixed satellite links in long-distance, high-capacity transmission. Substantial cost reductions have also been achieved in switching, reflecting software innovations and lower costs for integrated circuits and computers. Lower costs and significant improvements in software have also facilitated a variety of data- and transmission-intensive services (see figure).

**Index of transmission costs (per bits per second per kilometer; log scale)**




*Source:* Bond (1997).

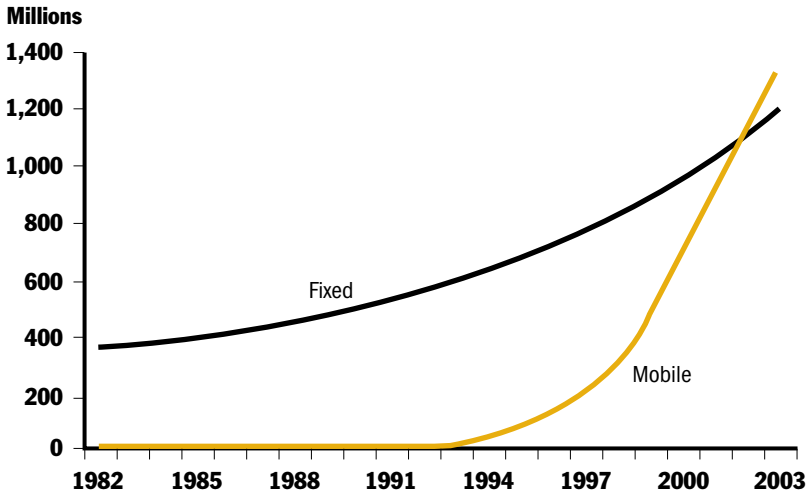
But technological change has not had nearly the same effect on costs in areas where use is not concentrated. Technological change has been limited for nontraffic-sensitive, customer-specific loops that connect every subscriber to a central office. For low-volume nodes, copper cable was until recently the lowest-cost technology. Still, fiber optic distribution and microwave bypass have become economically viable in large office buildings.

In recent years telephone networks have been substantially digitized. Digital bits traveling on these networks can be parts of voice, video, or computer applications. Voice is treated as data, blurring the boundary between voice telephony and data services. When regulation-imposed price discrimination between voice and data is eliminated, arbitrage can dramatically reduce the cost of voice calls that use relatively few bits—with important implications for pricing and market structure. Internet-based telecommunications services already threaten traditional long-distance service providers. As bandwidth to customers' homes increases, placing voice calls over the Internet will likely become a viable alternative to wireline telephones. Thus advances in technology have made the old, monolithic structure of the telephone industry both inappropriate and unsustainable.

*Source:* Arnback 1997; Economides 1998; Noll 2000d.

But the costs of wireless technology have been declining, and in many cases (such as in areas with low subscriber density) it is now cheaper than wireline. As a result these services will increasingly substitute for one another. Moreover, the much flatter cost curves of wireless technology indicate that size does not confer significant cost advantages. It is now cost-effective to have several competing providers of

**Figure 1.3 There Are Now More Mobile Phone Users Than Fixed Phone Lines**




*Source:* ITU (2003).

local telecommunications services: a regulated monopoly is no longer the optimal market structure. These developments have enormous implications for developing countries with underdeveloped fixed networks, especially in low-density rural areas.

**A new form of radio technology is challenging local loops—the traditional bastion of monopoly power**

In contrast to electricity and telecommunications, technological changes in transportation have been evolutionary rather than revolutionary. The introduction of jet engines in the 1950s and the larger aircraft sizes and loads made possible by turbofan engines and improved airplane designs resulted in lower operating costs and dramatically changed the competitive landscape for long-distance passenger and freight transport. But in the early 1970s new engine, track, and signaling technologies made high-speed trains possible, restoring some of rail's competitive advantage—though the introduction of multiple-axle trucks and better road engineering significantly altered competition between trucking and railways in freight transport. The organization and conduct of transportation markets have also been profoundly changed by containerization, intermodalism, and advances in freight logistics and information technology (such as real-time tracking of freight containers). In the water sector, advances in telemetry and satellite imaging show considerable promise for the efficient management of scarce resources.

## Framework for Assessing Reforms and Regulations

IN RECENT YEARS INFRASTRUCTURE IN DEVELOPING AND TRANsition economies has been plagued by three related problems:

- Chronic underinvestment—causing significant deterioration in service quality and seriously undermining providers' ability to respond to new demands and expand service. As a result large portions of rural and poor urban populations lack access to basic services.[5]
- Underpricing—with both the level and structure of prices conflicting with the dictates of economic efficiency and arguably with social equity as well.
- Extraordinarily low operating and financial performance—with inefficient public utilities draining state budgets, diverting resources from other essential services (such as health and education), and impeding domestic economic growth and international competitiveness.

The performance of each infrastructure sector is multifaceted and not amenable to definitive evaluations. But given the common problems facing these sectors in developing and transition economies, reforms are evaluated in this report using three broad criteria: resulting investment levels (and thus service expansion), operating (technical) efficiency, and allocative efficiency (as indicated by the rebalancing of tariffs).

Given the high poverty in these economies, careful attention must also be paid to whether infrastructure reforms help reduce it. Poor people often lack access to basic infrastructure services, which forces them to pay high costs for low-quality substitutes—further undermining their economic opportunities (Brook and Irwin 2003).

### One Model Does Not Fit All—Choosing among Imperfect Systems

The restructuring of network utilities over the past two decades has shown that there is no universally appropriate model for reform (Laffont 2003). Every restructuring and privatization program must take explicit account of each sector's features (its underlying economic at-

tributes and the technological conditions of its production) and the country's economic, institutional, social, and political characteristics. A cookie-cutter approach to reform is unlikely to succeed and leads to problems for the public interest.

The limits of state ownership are numerous and widely accepted. But that does not imply that private enterprise is a superior organizational form for all infrastructure activities and in every country. Before state ownership is replaced, the properties and requirements of the proposed alternative must be carefully assessed—not just generally but also specifically for the activity and country in question (box 1.3).

**The vertically integrated, state-owned utility model is largely a straw man from today's perspective**

## Box 1.3 Power Generation in Brazil Shows That Privatization Is Not Always the Best Approach

ADVICE ON PRIVATIZATION NEEDS TO REFLECT A thorough understanding of the sector and country concerned. Power generation in Brazil shows how even policy recommendations that make sense in most contexts can be inadvisable in others.

Hydropower accounts for 95 percent of Brazil's electricity system, relying on large, multiyear storage dams. Unlike in most countries, the long-run marginal cost of additional hydropower investment is probably lower than that of combined cycle gas turbines. But Brazil's dams have multiple uses, and managing them for irrigation and other purposes requires close basinwide coordination between water management authorities and power dispatchers.

These conditions provide a strong argument for public ownership and operation of the dams, while being the least propitious for a competitive, privately owned generation market. Investing in multiuse hydroelectric projects that require coordinated regulation would entail considerable risk for private investors. Dams are entirely front-end loaded, with massive investment costs but negligible operating costs. Thus the gains from private operation are likely to be small, while there are large risks that prices will be held down during periods of tight demand.

Investing in combined cycle gas turbines is equally unattractive to private investors. Though flexible plants with small capital costs may be desirable for low-cost system expansion, the thermal capacity would operate only in drought years—resulting in a likely overall load factor of less than 35 percent. Power prices would be determined by hydro units and would likely be unremunerative for combined cycle gas turbines unless special payments were made for their role in providing emergency or reserve capacity.

Thus it is unlikely that private ownership is an efficient way to plan, develop, and finance power generation in Brazil. And it remains an open question whether private ownership would ever be efficient in countries requiring large-scale, multiuse river basin management. The most favorable circumstances would be for dams used solely for hydroelectricity where the price of electricity is set by thermal plants, as in Argentina and Chile. Private involvement in generation has a comparative advantage when timely construction and maintenance are required to achieve efficiency benefits—but it is unlikely to work well in predominantly hydropower systems.

*Source:* Newbery (2001).

The benefits of privatization come from the changed incentives for privatized firms. But those incentives also depend on the competition and regulation facing such firms (Vickers and Yarrow 1991). In many developing and transition economies, small markets appear to limit opportunities for introducing competition among utilities. Efforts to establish effective regulation, especially in such naturally monopolistic small markets, will likely be impeded by a lack of technical expertise, insufficient institutional preconditions (such as well-developed accounting systems), and a resistant political and administrative culture. Thus the relationships between privatization, incentives, and efficiency are complex—and the difference between public and private ownership in developing and transition economies is often much less distinct than in countries with stronger institutions and better-developed private sectors.

**Different sectors demand different reforms.** Among network utilities, telecommunications offers the most compelling case for privatization and liberalization in developing and transition economies, because:

- Revolutionary technological change has almost eliminated natural monopoly.
- In most developing countries coverage is very low and the gains from easing restrictions on entry could be substantial.
- The cross-subsidies embedded in monopoly pricing structures cannot be defended on equity grounds because most people with telephone connections are relatively well-off.
- There is significant scope for flexible pricing to alleviate supply shortages, because consumers are willing to pay for new and better services and the sector is suited to competition.
- The financial, technical, and managerial resources of private entities may give them an advantage in keeping abreast of this increasingly complex industry.

In many segments of the transportation sector—railways, trucking, ports, airlines, interurban busing—the pressures of inter- and intramodal competition justify substantial liberalization and privatization in most countries. It is difficult for regulators and service providers to predict efficient, market-responsive vertical relationships and combinations of logistical roles among rail entities, truckers, barge operators, port operators, air carriers, warehouses, and the like. But experiences from both

advanced industrial economies and developing and transition economies confirm what theory predicts: decentralized, market-oriented decisionmaking—freed from excessive regulation and energized by market incentives—is the surest way to achieve efficient, innovative solutions to the needs of these transport modes.

It is important, however, to distinguish between transport services—which are generally competitive or contestable—and transport facilities—which may have natural monopoly characteristics. The case for privatizing transport facilities is much less compelling than that for services operating on the network. For rail track, basic and access port infrastructure, and portions of airport facilities—where monopoly is unavoidable or substantial sunk capital is involved—public regulation or even operation is essential.

Electricity restructuring and privatization are more problematic in developing and transition economies. Wholesale competition has worked well in industrial economies because of excess capacity, modest demand growth, and the availability of gas that enabled the entry of gas-fired plants at modest scale and relatively low cost. In contrast, electricity markets in many developing and transition economies face capacity shortages, excess demand, and periodic blackouts. The recent experience in the U.S. state of California shows how market liberalization under conditions of tight demand can create serious problems—market clearing prices are politically unacceptable and will likely derail attempts at radical liberalization.

In most developing and transition economies electricity prices have historically been low, and their realignment with underlying costs has been prevented by politicians. (In several developing countries attempts to raise tariffs during severe power shortages have led to riots.) Private entrants facing significant sunk costs would naturally demand credible commitments that future prices would provide adequate revenue. But most of these countries have not implemented the regulatory mechanisms needed to provide such commitments.

Moreover, electricity markets are relatively small in many developing and transition economies: in 60 developing countries peak system loads are less than 150 megawatts, in 30 between 150 and 500 megawatts, and in 20 between 501 and 1,000 megawatts (Bacon 1994). Opportunities for introducing competition in such small systems will be limited even under the most favorable circumstances. And even in a large market—such as Brazil's—sector conditions can make privatization of electricity generation nonviable (see box 1.3). Thus the suitability of privatizing

electricity needs to be carefully assessed based on the circumstances in each case.

The scope for introducing competition in water and sewerage services is much more limited than for other network utilities. Local networks of pipes and sewers remain quintessential natural monopolies. Moreover, unbundling is not especially attractive because the benefits from increased competition in supply are likely to be considerably less than in other network utilities—the costs of producing water are low relative to the value added at the transportation stage, though this may vary across countries (Armstrong, Cowan, and Vickers 1994). On the other hand, there are greater opportunities for introducing competition in sewage treatment. Overall, franchising is likely the most effective way of increasing competition in this sector.

**Unbundling is no panacea.** In recent years policymakers have taken two broad approaches to restructuring utilities (Newbery 2000a, 2002). The radical approach has been to vertically separate the monopoly segments (transportation and distribution) of these industries from the structurally competitive segments (upstream production and downstream marketing). The second approach, called *competitive access*, allows integrated operations by the dominant incumbent utility on the condition that it make its bottleneck network facilities available to other entities on a fair and equal basis. These two options have different implications for efficiency, competition, coordination economies, scope economies, transaction costs, investment structures, regulatory complexity, and overall performance. Thus the choice between them is not clear-cut.

The basic tradeoff between vertically integrated and unbundled forms of organization is between potential losses of coordination and scope economies and possible increases in transaction costs, relative to potential efficiency gains from competition and increased transparency (Brennan 1995; Klass and Salinger 1995; Joskow 2003b). But in many cases these tradeoffs have not been carefully assessed. Instead, simplistic approaches to competition and restructuring have ignored economies of vertical integration and challenges of replicating vertical relationships with market mechanisms—leading to many problems in utility restructuring and privatization.

Lately, considerable attention has focused on vertical unbundling, where the ownership of infrastructure networks is separated from the

provision of services—with the infrastructure assets held by the "infrastructure entity," whether it be the government, a consortium of operators, or a regulated private entity. This approach has considerable appeal because it can facilitate active or potential competition among service providers (operators) with equal access to network facilities. Thus unbundling can mitigate the problems associated with network infrastructure costs, which can block comprehensive deregulation and create significant entry barriers because such costs are large, fixed, and mostly sunk.

With vertical unbundling, operators need not be subject to detailed regulatory scrutiny. Moreover, competition encourages them to be more efficient, entrepreneurial, and responsive to consumer needs. But several links in this chain of policy reasoning may be inapplicable or incorrect in real-world circumstances, especially in developing and transition economies. Unbundling can cause serious coordination problems, reduce economies of scope, and impose other unnecessary transaction costs (box 1.4). So, separating operations from infrastructure networks is not a universal panacea for restructuring problems.

Unbundling is likely to be most attractive when market size and density would allow many infrastructure entities to function and compete. But in many developing countries, markets may be too small for substantial competition to emerge. Unbundling is also aided by well-developed fixed facilities, which minimize the need for new infrastructure investments and so the likelihood of incentive and coordination problems. Where such facilities do not exist—as is likely in most developing countries—regulation should permit the infrastructure entity to enter into medium- and long-term contracts with operators and end users. Doing so allows the risks and rewards of infrastructure investments to be efficiently shared by operators, users, and the infrastructure entity. Such efforts require coordination among parties whose investment interests are not necessarily in harmony.

Unbundling is also no panacea for regulatory challenges. Although separation creates incentives to give competing operators equal access to infrastructure facilities, it does not resolve the difficulties of regulating access to bottleneck facilities. Prices for end users will be at least the sum of operators' competitive prices for services and infrastructure entities' regulated prices. But because it is difficult to set prices that reflect users' varying needs, regulated prices are unlikely to cover replacement costs (see box 1.4).

## Box 1.4 Disadvantages of Vertical Separation

- Providing innovative, market-responsive infrastructure services may require specific investments in infrastructure such as maintaining or upgrading fixed facilities. It may be difficult and inefficient for service providers to coordinate with monopoly owners of network facilities—especially if their incentives for investment are not in harmony. The investment incentives of any monopolist will depend on whether it is state-owned or, if in private hands, on the nature of its regulation.
- Efficient use of infrastructure facilities requires close coordination among service providers driven by their needs and sensitivities as well as those of their customers. Competing providers will battle over scarce or congested infrastructure facilities, and sorting out their claims is crucial to a utility system's efficiency and responsiveness. This task is hard enough for an unintegrated system with a monopoly infrastructure entity, but it seems almost impossible where there are rules against discrimination and infrastructure pricing is either tightly regulated or (for a state enterprise) politicized.
- It is plausible, especially in small countries, that upstream production or service activities on all or part of a utility system are a natural monopoly—even when they have been split apart from network infrastructure. Thus a separated service provider may be a monopoly, and it may have considerable market power unless there is powerful potential competition.
- Separation makes it difficult to develop pricing that covers replacement costs for network infrastructure. Where economies of scale are important, efficient pricing for such costs requires that different network services have different prices relative to marginal costs. If service providers can evade price discrimination by the infrastructure entity—so that it cannot collect different prices from operators offering different services—it will be difficult if not impossible to efficiently defray the costs of the infrastructure. At the extreme, a regulated infrastructure entity charging competing service providers the same price for each unit of use of its facilities is essentially recreating a system in which prices are based on fully allocated costs. Such pricing can be a prescription for inefficiency and financial disaster.

*Source:* Kessides and Willig (1995).

Thus, while unbundling can reduce the scope for regulatory intervention by isolating monopoly segments and containing their damaging effects, it can also make performance much more sensitive to regulatory efficacy. Achieving the benefits of unbundling requires harmonizing regulatory oversight of monopoly activities and increased competition. Otherwise, inappropriate regulation of the interface between bottleneck components and competitive segments can create severe distortions that make the mixed system the worst of both worlds.

The primary virtue of the second restructuring option, competitive access, is that it exploits potentially important coordination and scope economies. Competitive access might be preferable when:

- Market size and density inhibit active and potential competition.
- Significant new infrastructure investment is needed.
- The industry's technical and economic characteristics render coordination among its segments critical.
- The country lacks well-developed contract law and dispute resolution mechanisms to facilitate flexible, reliable commercial agreements.
- Nonpayment issues are a serious concern.

But this option can be fraught with problems if the integrated utility is adverse to efficiency and competition. Competitive access generally requires that the integrated utility make its facilities available to other entities on a fair and equal basis. But if the utility has strong incentives to keep out other entities, it is unclear how effective equal access mandates will be. Despite such rules, several countries have seen potential competitors file disputes claiming unfair and unreasonable exclusion from a regulated utility's facilities (Estache and Rodriguez-Pardina 1999; Saavedra 2001).[6]

It may be extremely difficult to guard against such discrimination, especially in developing and transition economies with weak regulatory institutions. So, if an entrenched management and business culture make it impossible to convert a monolithic utility into one with competitive access, the more revolutionary approach to restructuring—vertical separation—may be a better option. Separation can lead to productive changes in the business culture and increase transparency by forcing a reassignment of responsibilities, roles, incentives, and information flows. Thus any assessment of competitive access must analyze the integrated utility's willingness to accommodate other potential service providers.

## Goals for Regulation in Developing and Transition Economies

The general goals of regulation are to promote efficient markets and correct for market failures. In newly liberalized and privatized infrastructure sectors, regulation should focus on:

- Pursuing social fairness and promoting universal service—through pricing that balances economic efficiency and social equity.

- Ensuring incentives for investment—so that reforms draw resources into the sector to expand, modernize, and improve infrastructure facilities and services.
- Promoting fair competition—by lowering entry barriers and giving entrants access to network infrastructure.
- Facilitating innovation—by focusing on goals to be achieved and giving operators and investors leeway to introduce more efficient technologies and innovative service arrangements.
- Protecting public health and safety, and avoiding harm to the environment.
- Ensuring that even where the private sector takes the lead, services are reliable and networks interoperable.

Although these principles apply to all countries, developing and transition economies pose four special challenges that realign the priorities and tighten the institutional constraints facing regulators (Laffont 2000; Smith 2000a).

**Expanding access.** In industrial countries (and better-off transition economies) most residents have access to electricity, telephone service, household water connections, sewerage, and a variety of transportation. Thus regulation can focus on maintaining overall incentives for efficiency and modernization. But in developing countries most people do not have access to these services at even a basic standard, and transportation and communication networks are sparse and of low quality. Large portions of the population—billions of people—live in urban slums and low-density rural areas that traditional utilities do not reach. The effectiveness of any regulatory strategy must be judged by its ability to expand access to basic services, rather than just increase convenience for people who already have services.

**Increasing affordability.** Although people and firms in industrial countries are sensitive to the prices of infrastructure services, affordability is not a major constraint for most. But among poor people in developing and transition economies the costs of connecting to infrastructure networks can be significant relative to incomes, and past policies have discouraged a large-scale search for cheaper alternatives. Still, many poor people would be willing and able to pay for efficient serv-

ices if they were offered. In countries that have introduced reforms, poor people have ended up with more services—though sometimes at higher prices. Any regulatory strategy must seek to promote affordability by encouraging lower service costs and providing manageable, effective subsidies where needed.

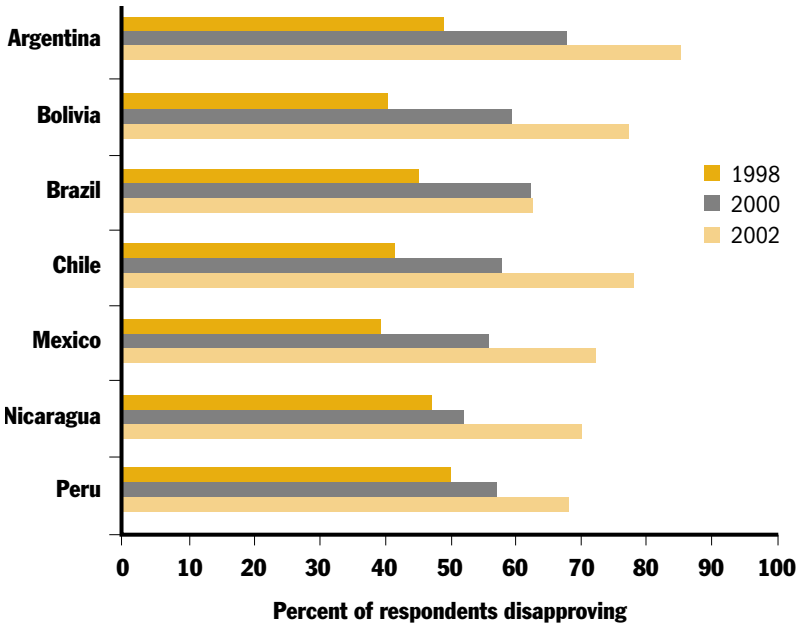
**Strengthening administrative and regulatory capacity.** Many if not most developing and transition economies have few administrators and technical workers with sufficient training and experience to be effective regulators. Even the most dedicated professionals are handicapped by difficulties in communications, inadequate access to information, shortages of mid-level personnel, and institutional norms that tolerate corruption and impede oversight by civil society. These capacity constraints create extra burdens in proving that regulatory reforms will be feasible and generate social benefits.

**Mitigating political and regulatory risk.** Most industrial countries have relatively stable political systems and independent judiciaries, and private investors have assurances that their rights will be protected without undue risk. But many developing and transition economies are undergoing political and institutional transformations. As a result private actors face less security and more political risk in making long-term investments, and so are wary of regulatory discretion. Without adequate safeguards against the misuse of regulation, investment will be discouraged and prices higher than needed.

## Recent Experiences with Privatization and Reform—Promises and Perils

FOR MUCH OF THE 1990S PRIVATIZATION WAS HERALDED AS the elixir that would transform ailing, lethargic state enterprises into sources of creative productivity and dynamism serving the public interest.[7] National leaders burdened by large budget deficits and stagnating economies were outspoken on the need to foster private initiative as a means of promoting growth and prosperity and enhancing the economic opportunities of all citizens. International financial insti-

**Figure 1.4 Latin Americans Increasingly Disapprove of Privatization**




*Source:* Latinobarometro (2002).

tutions offered advice and promoted this movement in countries that received their aid. The global media provided a near-harmony of voices praising this development in policy thinking (Shapiro and Willig 1990; Willig 1994b).

But as with all economic elixirs, privatization was oversimplified, oversold, and ultimately disappointing—delivering less than was promised. Recently, the alleged failures of privatization, improper restructuring, and overly rapid deregulation have led to street riots, skeptical press coverage, and mounting criticism of international financial institutions. This hostility is not limited to a few radical protesters. Public opinion polls in several developing and transition economies, especially in Latin America, reveal growing disenchantment with privatization (figure 1.4). Disapproval ratings were higher in 2002 than in 2000, and those in 2000 were higher than in 1998. In 2002 nearly 90 percent of Argentines and 80 percent of Chileans polled disapproved of privatization despite demonstrable improvements in the performance of privatized firms. This disillusionment has been driven by employee layoffs, price increases, perceived long delays in benefits, and the distributional impacts of privatization.

### Effects on Efficiency—Grounds for Optimism

Future privatization and regulatory reform in developing and transition economies will be determined not just by prevailing economic and political philosophies and macroeconomic conditions, but also by assessments of experiences to date. Although some outcomes have been disappointing, there have also been substantial—but not always obvious—gains.

**Reviewing the evidence.** It is difficult to get a clear picture of reform results because every network utility's performance is multifaceted, and different observers place different weights on different aspects of performance. It is even harder to reach an unequivocal verdict on the effects that privatization and regulatory reform have had on the diverse industries and countries that have experienced them in varying ways and degrees. Assessment is further complicated by the brief history of privatization, restructuring, and regulatory reform in most developing and transition economies, by the severe measurement problems for crucial economic variables, and by the fact that privatization and regulatory reform have usually been implemented simultaneously—making it almost impossible to econometrically identify their separate effects. (Only in the United States, where the structure of ownership remained constant, can changes in performance be confidently traced to changes in regulation.[8])

These difficulties notwithstanding, most empirical evaluations of privatization and restructuring seem favorable (Gray 2001; Megginson and Netter 2001). At the microeconomic level, evidence indicates that privatization improves the efficiency (in terms of labor and total factor productivity) and financial performance of utilities and leads to service expansion. This information comes from a variety of studies that have analyzed the pre- and post-privatization performance of individual firms, cross-sections of firms from different industries in the same countries, and cross-sections of firms from different countries (Galal and others 1994; Boubakri and Cosset 1998; Sheshinski and Lopez-Calva 2000; Delfino and Casarin 2001; Dewenter and Malatesta 2001; Torero and Pasco-Font 2001).

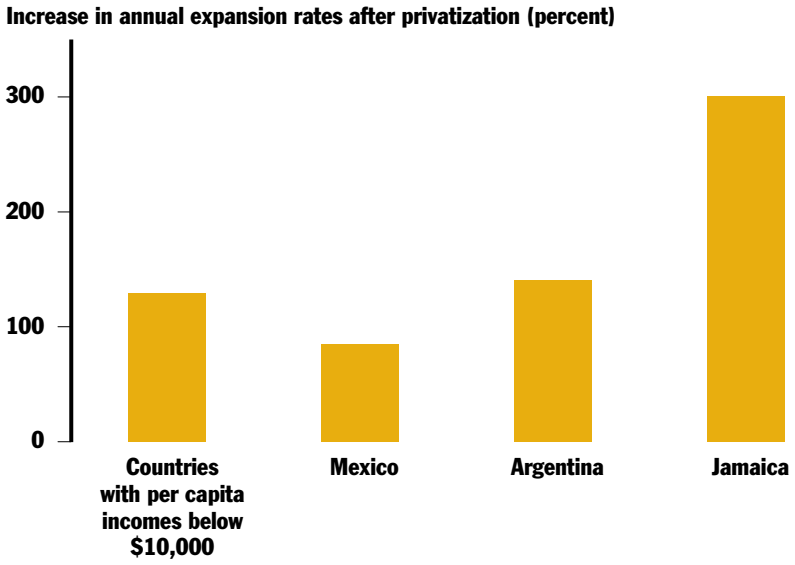
Other studies are more equivocal about the economic gains from privatization alone, and find that its success or failure depends on post-privatization regulation (Levy and Spiller 1996; Bortolotti, Siniscalco,

and Fantini 2000; Torp and Revke 1998; Jamasb and Pollitt 2000; Villalonga 2000; Arocena and Price 2002) and the extent of competition introduced in the market (Bouin and Michalet 1991; Kwoka 1996; Kleit and Terrell 2001; Zhang, Parker, and Kirkpatrick 2002).

**Assessing outcomes in telecommunications.** A detailed assessment of post-reform performance in the electricity, transportation, and water sectors is provided in chapters 3, 4, and 5. This section analyzes experiences with privatizing and liberalizing telecommunications—the clearest example of changing public policy toward infrastructure, and the sector that has undergone the most reform in developing and transition economies.[9]

Several studies have shown that privatization contributes to network expansion. A study in Argentina, Jamaica, and Mexico found that telecommunications networks expanded significantly after privatization. Jamaica's telecommunications firm increased its annual network expansion rate from 4.5 percent in the 11 years before privatization to 18 percent in the 4 years immediately following (figure 1.5). Entel, the Ar-

**Figure 1.5 Privatization Has Led to Rapid Growth in Telecommunications Networks**




*Source:* Ramamurti (1996), Ros (1999).

gentine telecommunications firm, increased annual network expansion from about 6 percent in the decade before privatization to more than 14 percent afterward. In both cases increased network expansion resulted from a tripling or quadrupling in capital spending (Ramamurti 1996).

Analysis of both developing and industrial countries has found that privatization has similar effects on the performance of telecommunications firms. Holding other factors constant, privatization is associated with both a larger number of and higher growth in main lines per capita. Among countries with per capita incomes below $10,000, those that allowed majority private ownership in their incumbent operators had 31 percent more main lines per capita and 129 percent higher growth in main lines per capita during 1986–95 (Ros 1999). Moreover, privatization is associated with higher operating efficiency and labor productivity (as measured by main lines per employee). Efficiency gains seem to have resulted from better incentives and increased productivity, rather than from firing employees (Bortolotti and others 2001).

**The efficiency benefits from private participation largely depend on the incentives created by competition and regulation**

Though these results are encouraging, their incidence and magnitude depend on the extent to which the privatized telecommunications market is liberalized and on the effectiveness of regulatory regime. A study of 86 developing countries in Africa, Asia, the Middle East, and Latin America and the Caribbean over 1985–99 found that a combination of reforms—privatization, competition, and support for an independent regulator—produced the largest performance gains. On average, productivity was 21 percent higher than in countries with partial or no reform (Fink, Mattoo, and Rathindran 2002). Competition can have an especially powerful effect: Ros (1999) found that introducing both competition and privatization in telecommunications increased efficiency more than did either policy alone. In addition, an analysis of 30 telecommunications industries in Africa and Latin America reveals that privatization significantly improves performance only when it is accompanied by an independent regulator (Wallsten 2001).

In Latin American countries that granted 6- to 10-year monopoly licenses to privatized telecommunications operators, the average network growth rate was 45 percent higher than under state ownership—but only about half the rate in Chile, where the government retained the right to issue competing licenses at any time (figure 1.6). The complementarity between privatization and competition in spurring telecommunications capacity expansion is confirmed by an analysis of wireline performance in a large number of developing countries (Laffont

**Figure 1.6 Private Competition Generated the Fastest Growth in Telecommunications Lines in Latin America**

Annual growth rate (percent)

| | 1984–89 | 1989–94 |
|---|---|---|
| Brazil, Colombia, Ecuador, Peru, Uruguay | 7.0 | 7.8 |
| Argentina, Mexico, RB de Venezuela | 6.7 | 11.3 |
| Chile | 6.6 | 20.5 |

State monopolies
Privatized monopolies
Privatized open markets

*Source:* Wellenius (1997b).

and N'Guessan 2002; Li and Xu 2001). The benefits of liberalization are also confirmed by an analysis of wireless markets in several small and medium-size emerging economies (Chile, Côte d'Ivoire, Ghana, Malaysia, Mexico, Philippines, Romania). In most cases the introduction of a competing cellular operator lowered prices, increased service options, and resulted in service innovations. Moreover, the lower prices and service enhancements stimulated demand, leading to more subscribers for all competitors—including the incumbent wireline operator (Rohlfs and others 2000).

## Distributive Impacts—Need for Caution

Empirical evidence increasingly shows that concerns about privatization and market liberalization's adverse effects on poor people have been largely exaggerated. There is no evidence that such reforms hurt poor or rural consumers—at least in terms of access to service. Even when service prices increase, the share of poor and rural households with connections does not decrease. And in many cases coverage increases, possibly because connection fees fall once service is no longer

rationed. Indeed, case studies show that allowing entry and competition in infrastructure services can dramatically increase services for poor people. Competition introduces a range of price and quality options, making service possible in regions and at income levels that monopoly providers would never have considered (Clarke and Wallsten 2002).

The discrepancy between scholarly assessments and public perceptions of privatization may reflect the use of different yardsticks and time horizons. Consumers dislike higher prices even if they result in better service. Similarly, the public dislikes layoffs even when overstaffing was obvious. And needed tariff adjustments can hurt poor people. Thus more comprehensive welfare assessments of privatization are required, incorporating its effects on workers, on households in different spending categories, and on company profits and other elements of industry performance.

Recent empirical work offers insights on the distributive effects of privatizing and regulating network utilities. Argentina began privatizing its utilities in 1990, and post-privatization changes in utility prices and access led to varying changes in welfare (as measured by consumer surplus) among sectors and income groups. Welfare gains were achieved in telecommunications and electricity, while losses were experienced in gas and sanitation. Moreover, changes in the level and structure of prices seemed to hit poor households harder—or provided them with the least benefit (Delfino and Casarin 2001).

But studies using computable general equilibrium models have found that all income groups in Argentina benefited from the efficiency, quality, and access improvements resulting from the privatization of utilities (Chisari, Estache, and Romero 1999; Navajas 2000). The provision of more efficient infrastructure services affects most other sectors of the economy and promotes economic growth, enhancing poor people's economic opportunities (Kraay and Dollar 2000). When these general equilibrium effects are taken into account, the poorest groups seemed to benefit the most from the increased productivity and access that resulted from privatization (Benitez, Chisari, and Estache 2003).

Recent research in four Latin American countries (Argentina, Bolivia, Mexico, Nicaragua) indicates that privatization has no clear effect on prices—prices fell in about half the cases. But privatization did have adverse distributive impacts on the poorer half of the population because of large layoffs in privatized utilities. Still, the negative effects of

**In low-income countries most rural and many urban poor people do not have basic infrastructure services, so higher tariffs will primarily affect the middle and upper classes; but in middle-income countries higher tariffs will affect many poor people—especially in urban areas**

layoffs and higher prices were more than offset by increased access for poor consumers, enhanced service quality, and changes in public financing that benefited poor people more (McKenzie and Mookherjee 2003).

Thus there is a discrepancy between the statistical evidence on and public perceptions of privatization, and none of the studies reviewed here adequately explain the growing popular disenchantment with such reforms.[10] It is possible that due to data limitations and perhaps even methodological flaws, statistical models do not accurately measure the true welfare impact of these reforms. It is also possible that public perceptions are subject to systematic biases. The benefits of reforms are generally shared by a large number of consumers with relatively modest individual gains—certainly not the topic of newspaper headlines.

On the other hand, firing a significant portion of the employees of a large utility is more likely to lead to protests and attract media attention, even if the employment contraction is small relative to a country's total labor force. Psychologists have found that individuals exhibit loss aversion: they react more strongly to losses than to gains relative to the status quo. They also tend to have short time horizons—focusing much more on the immediate effects of policy reforms that might require painful adjustments, while discounting heavily the gains flowing in the future.

**Box 1.5 Prerequisites for Effective Privatization**

- Suitable, market-friendly institutions.
- A conducive legal system.
- Country- and sector-specific strategies.
- A microeconomic structure open to competition.
- Effective regulation.

### Effective Design—Crucial to Success

Privatization's bad reputation is not fully deserved. Some of the difficulties experienced have resulted from disillusionment and misunderstanding by the general public and poor communication by political leaders. Impatience with the time required for some of the benefits of privatization to emerge reveals a lack of awareness that even in today's rich industrial countries, it often took decades for major institutional reforms to achieve their intended outcomes (Baumol 1993). But public policies are largely determined by public support. Thus it is not enough to show that privatization generally improves things: policies must be designed to ensure that it does—and is widely seen to have done so.

Negative popular perceptions might also reflect a process that has at times been deeply flawed. For privatization to achieve its public interest objectives, several institutional preconditions must be met (box 1.5;

Guislain 1992). In developing and transition economies where privatization was pushed in the absence of such institutional safeguards, it was often oversold as the solution to all the problems facing these economies. Advocates of privatization may have overestimated its benefits and underestimated its costs and institutional requirements. Changing the structure of ownership involves making tradeoffs between different costs (Laffont and Tirole 1991).

Every infrastructure reform program has three main elements: privatization, competitive restructuring, and regulatory reform. Achieving the public interest goals of infrastructure reform requires strong policy attention to all three. In practice, however, governments and their financial advisers have focused on privatization transactions.

**The first trap: privatization without competitive restructuring.** To generate more revenue, some fiscally strapped governments have sold utilities as monopolies—accompanied by regulation that ensures this outcome instead of promoting competition (table 1.3). This tendency toward exclusivity has been encouraged by prospective investors and underwriting investment banks (whose fees are generally calculated as a percentage of the sales price). International financial institutions have

**Table 1.3 Exclusivity Periods for Incumbent Telecommunications Operators in Latin America**

| Country | Year exclusivity started | Length of exclusivity (years) |
|---|---|---|
| Argentina | 1990 | 10 |
| Bolivia | 1995 | 6 |
| Ecuador | 1995 | 5 |
| Honduras | 1995 | 10 |
| Mexico | 1990 | 6 |
| Nicaragua | 1995 | 4 |
| Panama | 1997 | 5 |
| Peru | 1994 | 5 |
| Venezuela | 1991 | 9 |

*Note:* Exclusivity agreements cover local calls, national long distance, and international long distance (except for Mexico, where local calls are not covered).
*Source:* ITU (1999).

also supported such arrangements, on the presumption that even poorly designed privatization is better than continued state ownership (Noll 2000a).

Several rationales are used to support exclusivity for privatized utilities. It is argued that high profit margins are needed to finance substantial new investment; that competition would undermine universal service goals (because new entrants would only want to serve low-cost, high-demand customers, undermining existing cross-subsidies); and that domestic markets are too weak and uncertain to attract foreign investors without the assurances offered by exclusivity (Laffont and N'Gbo 2000).

Creating private monopolies involves clear tradeoffs. Longer exclusivity secures a higher bid price and so higher immediate proceeds from privatization, while shorter exclusivity stimulates the economy through competition and generates higher recurrent tax revenue. But the basic argument for exclusivity is economically flawed, and such arrangements have led to problems after privatization.

Longer exclusivity elicits higher bid prices because a stream of monopoly profits is more valuable than a stream of competitive returns. But without large public subsidies for customers with limited ability to pay, high monopoly prices reduce the demand for services—leading to less private investment. By contrast, lower competitive prices—as long as they provide enough revenue for the network utility to compete with other firms in the economy for financing to maintain, replace, modernize, and expand its facilities and services—increase demand and so lead to more private investment. This argument is especially powerful in developing countries, where much of the population has a limited ability to pay (Noll 2001). Recent empirical analysis of telecommunications in developing and transition economies found that exclusivity periods are associated with a substantial reduction in investment and up to 40 percent lower growth in the number of telephone mainlines (Wallsten 2000).

One of the main arguments against liberalization is that it undermines network expansion and universal service goals, under the logic that profit-maximizing firms will not find it attractive to extend service to marginal subscribers. But emerging evidence casts doubt on this argument, especially in telecommunications. Several studies analyzing telecommunications in developing and transition economies indicate that market liberalization spurs, and exclusivity agreements retard, network development (see above).

Countries are learning from their mistakes and those of others. In the early 1990s early movers in Latin America (Argentina, Mexico, Venezuela) offered 6- to 10-year exclusivity periods in their telecommunications sectors. In the mid-1990s the second wave of reformers (Bolivia, Panama, Peru) offered exclusivity for 5–6 years. By 1998 small and poor countries (El Salvador, Guatemala) were able to sell their telecommunications companies with no exclusivity. They were also able to attract large numbers of service providers.

**When conditions make competition feasible, it would harm the public interest to privatize a monopoly using exclusivity arrangements**

**The fiscal benefits from privatizing a monopoly are not worth the costs**

Exclusivity is likely to be especially damaging in poor countries where the incumbent state-owned monopoly has not provided reliable nationwide service. People without connections to the monopoly network, especially the rural poor, could benefit from the availability of alternative suppliers who might make better use of technological advances and offer a wider range of prices and services than the incumbent monopolist. In the absence of competition, a privatized monopolist may remain lethargic and not innovate or expand coverage—especially if it is restricted by uniform pricing rules. Expanding access, especially to poor rural areas, requires a variety of approaches that exploit all technological opportunities and experiment with alternative forms of organizing supply. Exclusivity often undermines the potential for such service innovation.

Regulatory policing of exclusivity is also costly and difficult, especially in industries undergoing rapid technological change. For example, in telecommunications exclusivity has often been applied to traditional wireline services but not to wireless, satellite, and data services. But in recent years exclusive rights for a particular telecommunications technology have become a technological anachronism. Defining and enforcing the boundary between voice telephone service and data services are almost impossible. Although modern operators recognize this, they still complain that the exclusivity provisions of their licenses are being violated. Such complaints can seriously damage a country's reputation for foreign investment. Finally, exclusivity once granted can be very difficult or costly to reverse.[11]

**The second trap: weak regulatory capacity.** Especially during the early years of privatization, establishing appropriate regulation to curb the potential abuse of monopoly power was subordinated to the immediate goal of closing transactions. The limited attention paid to reg-

ulation focused on creating regulatory entities and writing their charters to meet the formal requirements of the privatization process or the conditions of international organizations. Regulatory institutions were often created simply by replicating systems from advanced industrial countries, mainly the United Kingdom and the United States.

Chapter 2 provides a detailed analysis of the problems and the reality gap characterizing this "transfer" of regulatory policy to developing and transition economies. Regulators in these countries have a decidedly mixed record in achieving effectiveness. In some countries an unrealistically hopeful and incorrect presumption guided the creation of regulatory institutions: that if issues of funding, organizational design, and procedural safeguards were resolved, satisfactory regulatory performance would emerge—serving the public interest. This approach underestimated the probability that the same political interference that made public enterprises in these countries so effective in collecting and dispensing favors to special interests would seek to preserve these benefits by capturing or weakening regulation.

It should have been expected that fiscally constrained governments in constant search of tax revenue would be tempted to retain political control over regulation, leaving monopoly rents to the operators and then taxing them away rather than distributing the efficiency gains of privatization to consumers (Estache 2002a). Because of deliberate government actions and a lack of understanding of the importance of separation of powers, it has been exceedingly difficult to establish and maintain regulatory independence in developing and transition economies.

In most of these countries effective regulation is also undermined by scarce technical expertise (Stern 2000a). Although regulators may be strong in certain technical areas, they often lack staff experienced in accounting, economic policy analysis, finance, and law. Moreover, hiring decisions may be constrained by rules for civil service employment. As a result it takes time to change the skills mix of staff in line with the requirements of privatized and restructured infrastructure industries.

Insufficient regulatory capacity can make it difficult for infrastructure reforms to achieve their public interest objectives. Such capacity is required to manage the competitive restructuring of network utilities and subject them to market discipline. So, in developing and transition economies where such capacity is weak, it is one of the main reasons such tasks have not been fully achieved.

Given the central role that incumbent utilities have played in developing their industries, it is no surprise that they have remained powerful players after privatization. Many incumbents have been supervised by weak regulators lacking autonomy, authority, technical capacity, and a clear mandate to resolve post-privatization disputes between various market participants. Accordingly, such incumbents often have little incentive to negotiate with their competitors and comply with legislation.

Weak regulatory capacity has hampered privatization and other infrastructure reforms in a variety of countries. For example, in Mexico the local telephone market was opened to competition in the early 1990s, and many entrepreneurs were interested in entering the market (Casanueva and del Villar 2003). Yet no local competition emerged for several years because the incumbent operator, Telmex, engaged in a variety of anticompetitive practices. Weak enforcement by Cofetel, the sector's regulator, made it easy for Telmex to do so. Slow telecommunications liberalization in many other Latin American countries can also be attributed to weak regulatory agencies (Pyramid Research 2001).

## Second Generation Reforms—Choices and Challenges

SINCE THE 1980S MANY DEVELOPING AND TRANSITION ECONOmies have implemented far-reaching restructuring, privatization, and regulatory reforms in key infrastructure sectors. Although experiences have varied considerably by country and sector, most of these first generation reforms have generated several of the expected social benefits of market liberalization and private enterprise, including enhanced productivity and cost-effectiveness, higher-quality output, greater responsiveness to consumer and business needs, and increased investment driven by market incentives rather than bureaucratic preferences. Policymakers in these countries deserve praise for their forthright privatization of utility industries and commitment to imposing market discipline.

Still, even in countries where reforms have been guided by state-of-the-art policy analysis, aspects of restructuring and privatization have had unintended consequences and are causing significant problems. Emerging second generation reform issues in the network utilities of de-

veloping and transition economies are endemic to infrastructure sectors everywhere and largely reflect problems that arise after privatization—especially when combined with unbundling. In fact, the asserted deficiencies of post-privatization regulation in these countries are similar to those experienced in advanced industrial countries. Still, developing and transition economies will see limited improvements in post-privatization performance unless they address these second generation issues.

This report seeks to refocus current policy debates on four second generation challenges that confront nearly all restructuring and privatization programs:

- Balancing economic efficiency and social equity.
- Fostering as much competition as possible given the changing technological and economic characteristics of these sectors.
- Adapting regulation to address emerging problems, changing circumstances, and new information in regulated infrastructure sectors.
- Protecting consumers, responding to their concerns, and soliciting their participation in the regulatory process.

## Balancing Economic Efficiency and Social Equity

Two pressing tasks face policymakers in developing and transition economies that have introduced infrastructure reforms. First, they must redress long-standing underpricing of infrastructure, which in many cases has limited service availability, benefited the middle and upper classes, and left large portions of rural and poor urban populations without access to basic services (table 1.4). Second, policymakers must pursue social goals—such as universal service and access for poor people—efficiently and without distorting competition.

**Political concerns have blocked cost-covering tariffs in developing and transition economies**

**Adjusting prices.** Underinvestment was one of the main problems of the old utility model in developing and transition economies, and was largely caused by underpricing (figure 1.7). Prices for basic services were held below supply costs, subjecting infrastructure entities to financial distress and impairing their ability to maintain and expand services, especially in poor and rural areas. The failure of many governments to

**Table 1.4 Access to Infrastructure Services in Urban and Rural Areas of Developing Regions, late 1990s**

*(percentage of households with access)*

| | Electricity | | Piped water | | Telephone | |
|---|---|---|---|---|---|---|
| **Region, income group** | **Urban** | **Rural** | **Urban** | **Rural** | **Urban** | **Rural** |
| Africa, low income | 43.7 | 6.6 | 36.9 | 3.7 | 5.7 | 0.3 |
| Europe and Central Asia, low income | 100.0 | 99.5 | 87.4 | 32.7 | 52.0 | 13.3 |
| Europe and Central Asia, middle income | 99.4 | 93.9 | 79.9 | 28.3 | 67.8 | 44.7 |
| Latin America, low income | 84.5 | 20.7 | 60.2 | 13.5 | 16.5 | 1.1 |
| Latin America, middle income | 95.6 | 51.4 | 78.0 | 38.9 | 39.7 | 4.3 |

*Source:* Clarke and Wallsten (2002).

raise prices, especially during periods of high inflation, decapitalized their infrastructure systems. Government subsidies perpetuated the problem until fiscal crunches occurred.

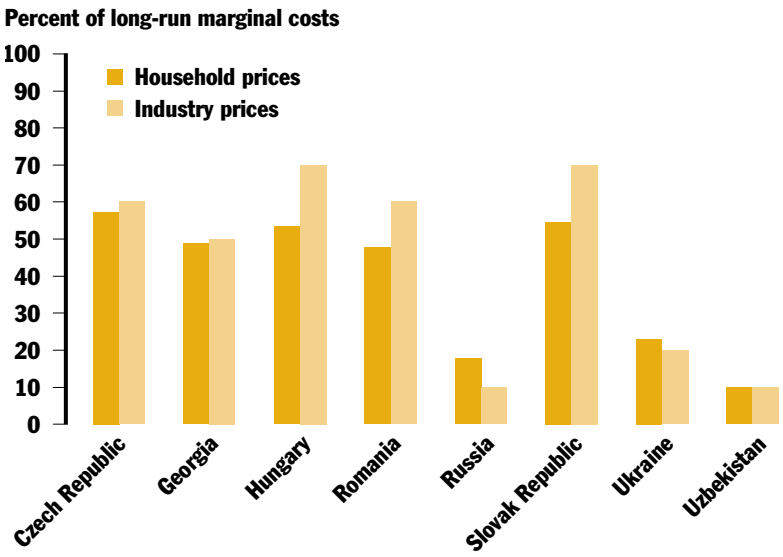
The choice was either higher taxes or higher prices. Higher prices would generally affect people who already had services—the middle and upper classes—while higher taxes were likely to be felt partly through inflation taxes that hit poor people or other groups without protective assets. A sensible, and arguably less regressive, response was to realign prices with underlying costs. Privatization requires such adjustments to attract investors—arguably one of its more attractive features.

Even developing and transition economies that have acted—sometimes aggressively—to stimulate competition in infrastructure have made only minor changes in pricing policies. Old-style, centralized price setting by sector ministries remains prevalent. Yet major changes are required to realize the full benefits of competition, and infrastructure entities must be allowed to compete using flexible prices and terms.

**Utility pricing is not the best mechanism for income redistribution, which is the responsibility of the tax system**

Policy solutions consistent with both economic efficiency and social equity are not always available or politically feasible. Thus policymakers in developing and transition economies face no more challenging second generation task than designing and implementing pricing reforms that strike a better balance between these two goals. In the long run, pricing policies that lead to insufficient revenue, underinvestment, and inadequate maintenance obviously do not serve the public interest. Moreover, despite their purported focus on social equity, the historic pricing policies of these countries have not served poor people either, since many have not had access to basic infrastructure services.

**Figure 1.7 Electricity Prices Often Fail to Cover Costs in Europe and Central Asia, 2000**




*Source:* Stern (2002).

Still, even though rebalancing infrastructure prices is likely to benefit all affected groups and contribute to social welfare, there is reason to avoid too abrupt a transition to a new pricing regime. Rapid price changes impose large, often difficult adjustment costs on consumers and firms alike. Even optimal prices, if instituted too quickly, can lead to a costly and damaging transition that is far from optimal.

Caution on the speed of price adjustments is especially appropriate in transition economies that have been undergoing painful transformations from centralized to market-driven economic systems. In many countries these transformations initially led to significant contractions in economic activity and sizable reductions in income levels. By some estimates, if district heating prices in 2000 were realigned with underlying costs, prices in Sofia (Bulgaria) would have risen to $50 a month—unrealistically high for a large portion of the population in a country where pensions range from $28 to $56 a month (Newbery 2000c).

In many transition economies higher prices, no matter how justified, have caused hardships because they coincided with significant reductions in incomes. For example, in Ukraine the prices of electricity and natural gas were almost 6 times higher in 1998 than in 1992, and prices for district heating (in Kiev) were more than 16 times higher. Yet dur-

**Table 1.5 Average Household Incomes and Energy Tariffs in Ukraine, 1992–98**
*(Index: 1992 = 100)*

| Year | Income | Electricity tariff | Natural gas tariff | District heating tariff (in Kiev) |
|---|---|---|---|---|
| 1992 | 100 | 100 | 100 | 100 |
| 1993 | 65 | 47 | 27 | 69 |
| 1994 | 44 | 79 | 46 | 180 |
| 1995 | 41 | 376 | 448 | 1,270 |
| 1996 | 38 | 578 | 643 | 1,953 |
| 1997 | 43 | 617 | 613 | 1,973 |
| 1998 | 43 | 594 | 563 | 1,644 |

*Note:* Incomes and tariffs have been adjusted for inflation (based on the consumer price index).
*Source:* World Bank staff estimates based on data from Ukraine's State Statistical Committee and Ministry of Economy.

ing the same period average household incomes fell by more than half (table 1.5).[12] Thus price adjustments need to be appropriately phased and may need to be accompanied by other policies (such as social safety nets) to ease the burden on the most vulnerable consumers.

**Finding effective alternatives to cross-subsidies.** Most countries aim to achieve universal access to certain basic infrastructure services. When services were provided by monopolies (typically state-owned, but occasionally private), these obligations were theoretically funded by subsidies and, more commonly, cross-subsidies: high-income and low-cost consumers were charged prices above costs to finance services to low-income and high-cost consumers, who paid prices below costs. In telecommunications, for example, rates for local calls and access tended to be low while rates for domestic and international long-distance tended to be high relative to underlying costs. Similarly, electricity service for households was often priced below its supply cost, while service for industrial users was priced above.

Subsidies have often been poorly targeted and failed to reach poor consumers. In India, for instance, state subsidies for water services totaled more than $1 billion a year (0.5 percent of GDP) in the late 1990s—but poor households captured only a quarter of these (Foster, Pattanayak, and Prokopy 2003). Although lower prices can increase demand for infrastructure services from rural and poor consumers, they also lead to supply-side distortions that reduce or negate their effects.

Moreover, the opaque nature of cross-subsidies makes it difficult to determine who pays for and who benefits from them. There is strong evidence that state-owned monopolies have failed to ensure access for rural and low-income urban consumers, especially in Africa (Clarke and Wallsten 2002; Brook and Irwin 2003). Indeed, wealthier consumers appear to have benefited far more from subsidies than have the poor.

Distorted prices impose significant economic costs by sending the wrong signals to consumers, suppliers, and investors. For example, low charges for telecommunications often exacerbate congestion by encouraging overuse of facilities. Moreover, prices based on cross-subsidies are unsustainable in a liberalized market. Indeed, policymakers overseeing restructured and privatized infrastructure industries in developing and transition economies will increasingly face a seemingly irreconcilable dilemma: it is generally impossible to impose cross-subsidies (to support favored groups of customers) while promoting competition (Baumol 1999). Competitive entry will destroy cross-subsidies. Moreover, generating adequate revenue—crucial to any rational privatization program—requires realigning prices with underlying costs. Thus market liberalization will require finding new sources of subsidies or raising rates that were below incremental costs.

Privatization and competition do not solve all the problems of providing infrastructure services. Competition limits the ability to cross-subsidize services. But entry and competition also allow entrepreneurs to test new ways of providing services to rural and poor areas, generating a wide range of service, price, and quality options. And given the near-failure of public monopolies to provide services to poor people, these reforms provide an opportunity to rethink how to fund social goals and ensure such access. If funding through general tax revenue is too difficult or costly, second generation reforms should focus on new methods to raise subsidies. Possible approaches include competitively neutral financing mechanisms such as universal service funds and subsidy auctions.

## Fostering Competition after Privatization

In many developing and transition economies, developing free markets will require drastic changes in government regulations and business cultures, with radically different approaches to oversight and codes of

### Box 1.6 Using Competition Policy to Avoid Regulatory Capture

TENSION ALWAYS EXISTS BETWEEN REGULATION and policies that seek to promote competition. As part of second generation infrastructure reforms, policymakers must strive to resolve this tension. Regulation typically pushes common rules for firms in the same industry—for example, by setting pricing formulas or even imposing common production technologies. Thus a regulator may have the statutory power to make decisions that in competitive markets would normally be made by firms. Regulatory capture occurs when market participants exploit this power at the expense of their competitors. Thus regulation often has significant unintended anticompetitive effects.

Competition policy can limit the extent and damage of regulatory capture. An antimonopoly agency can review important regulatory decisions, announce its views on the likely impacts of such decisions on competition, and take action against firms that use the regulatory process for anticompetitive purposes.

competitive conduct. Given the daunting policy challenges facing these countries in recent years, it is understandable that many governments have paid insufficient attention to competition policy during the early stages of infrastructure reform. But competition policy can provide an important complement to other policies aimed at fostering an efficient, dynamic economy—especially industry-specific regulatory reform and privatization (box 1.6).

The long structural legacy of infrastructure industries could make it extremely difficult to develop competitive markets. Nevertheless, the new model for network utilities offers considerable scope for competition. However, unbundling and relaxing rules on market entry will not be sufficient to develop and maintain such competition. Competition law has a potentially critical role to play and should be given maximum scope (Willig 1992; Newbery 2003). Thus an important second generation challenge is developing policies that promote competitive entry and prevent monopolies from leveraging their market power in competitive industry segments (box 1.7; Noll 1995).

Even when market conditions are favorable, government guidance is required for competition to work well (Willig 1999). This framework should not be limited to punishing anticompetitive conduct; there is also an urgent need to ensure that competition policy fosters entry and entrepreneurship by facilitating access to network facilities and other infrastructure.

### Box 1.7 Telmex's Market Power in the Internet Market

DESPITE NUMEROUS CONCESSIONS GRANTED IN various segments, competition continues to be fairly limited in Mexico's telecommunications industry. The main obstacles to a competitive market are the overwhelming size of the incumbent, Telmex (Telefonos de Mexico), and the weakness of the regulatory agency, Cofetel (Comision Nacional de Telecomunicaciones). Through its extensive control of the industry's bottleneck facilities, Telmex enjoys considerable market power, which it has been leveraging into such competitive segments as the Internet and value added services. For example, Telmex is providing DSL technology to its Internet affiliate but not to competing Internet service providers. This refusal to deal is allowing Telmex's Internet affiliate to monopolize this important segment of the market.

*Sources:* Pyramid Research (2001); Casanueva and del Villar (2003).

**Creating competition policy.** The first step in devising direct economic regulation—prescribing prices, entry conditions, service requirements, and the like—is to determine which markets and services should be subject to it and which are best left to market discipline. This determination is rarely easy: real-world competition is invariably imperfect, as is regulation. Conventional wisdom predicts that the benefits of even highly imperfect competition will typically exceed those of thoroughly regulated franchise monopoly. Still, it is usually necessary to directly regulate essential services supplied under natural monopoly—although here again, it is often impossible to be sure which markets and services are naturally monopolistic and which are perhaps only temporarily so, but sufficiently to justify imposing direct regulation.

For activities not subject to direct regulation, a purely laissez-faire approach will rarely be adequate to protect the public interest. Unregulated businesses can pursue their interests by colluding to suppress competition or excluding rivals from opportunities to compete. Thus most societies relying on open markets have felt it necessary, in the absence of comprehensive direct regulation, to enforce general antitrust or antimonopoly laws. Such laws vary by country. Some seek to remedy unacceptably monopolistic markets by subjecting them to restructuring or direct regulation. Others merely prohibit or correct attempts by firms to restrain competition among themselves or by market-dominating firms to exclude potential competitors.

Whereas direct regulation tends to be industry-specific—and administered by agencies specialized in controlling a particular indus-

try—antitrust and antimonopoly enforcement is better vested in agencies that oversee the entire range of industries and markets. Such agencies tend to develop considerable expertise in appraising the structure, behavior, and performance of markets, identifying possibly excessive market power, and fashioning remedies that retain competition as the main governor of industry performance. These remedies include dissolving excessively monopolistic companies, requiring that dominant companies divest their assets, prohibiting tactics such as predatory pricing and exclusive dealing, and blocking mergers, acquisitions, and other business combinations deemed damaging to competition.

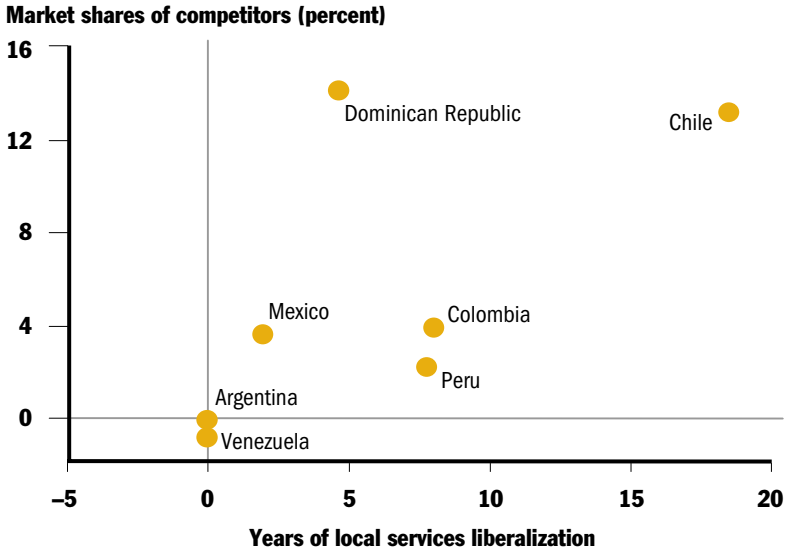
Many developing and transition economies, however, still lack strong antitrust enforcement. Some have not even implemented the basic elements of competition law—as in the Philippines—and have made uneven progress in establishing sector regulators and antitrust agencies. The creation of regulatory agencies has received more attention because they are required for privatization.

Regulatory agencies must strike a careful balance between monitoring restructured and privatized infrastructure industries and ensuring that they do not micromanage deregulation and hinder competition in these industries. This is a legitimate concern given the tendency of regulation to expand into areas where it was not intended, with undesirable consequences. Still, given the weakness of antitrust agencies in developing and transition economies, regulatory agencies will have to assume a greater monitoring role, at least in the short run.

**Ensuring access to bottleneck facilities.** One of the most vexing tasks facing infrastructure regulators is designing the terms of access to bottleneck facilities for competing service providers. These facilities are essential in producing or delivering final products and are incapable of being economically duplicated. The best examples include the local loop ("final mile") in telecommunications, the transmission grid in electricity, the network of pipelines in natural gas, and the track in railways. Access policy is the cornerstone of the contemporary response to residual monopoly in infrastructure. Indeed, it is at the fore of discussions to facilitate competitive entry in activities traditionally run by franchised monopolies.

Without good access rules, efficient entry will not materialize in these industries and the benefits of market liberalization will not obtain.

**Figure 1.8 Despite Liberalization, Entrants into the Local Exchange Account for a Small Share of Latin American Telecom Markets, 2001 Second Quarter**




*Source:* Pyramid Research (2001).

In Latin America, for example, several countries—Argentina, Brazil, Chile, Colombia, Dominican Republic, El Salvador, Mexico, Peru, Venezuela—have opened their telecommunications markets to local-loop competition. But in none of these countries (including Chile, where local telecommunications services have been liberalized for more than 20 years) have new entrants been able to gain more than 15 percent of the market (figure 1.8). One of the main reasons is the lack of clear interconnection policies and the inability of regulators to enforce interconnection rates (Pyramid Research 2001). Local exchange carriers have not fared any better in Europe or the United States.

With the progressive introduction of competition in the public utility industries of developing and transition economies, more rival firms will seek to interconnect to their networks. At each interconnection point, an access price will have to be determined. Access terms should not distort how prices are adapted to consumer preferences and demands for services. Prices should be high enough to be compensatory (at least cover the long-run incremental cost of the use of the network

by the entrant), yet not so high as to preclude efficient operations by entrants. Thus regulation should ensure that there is sufficient pressure on the owner of the infrastructure to operate in efficiently, but that no unnecessary duplication of network construction occurs.

A basic goal of access policy is ensuring competitive parity—meaning that competition in final service (product) markets is efficient and does not favor owners of bottleneck facilities or their actual and potential rivals. Rules consistent with competitive parity should minimize the costs of contested services by assigning responsibilities for them based on firms' efficiency, as indicated by their production costs and service prices. But achieving fair access rules has proven difficult, and is an area where developing and transition economies will require substantial technical assistance.

## Adapting Regulation

Regulation must adapt to address emerging problems, changing circumstances, and new information in the infrastructure sectors. Regulatory adaptation is especially imperative in sectors undergoing rapid technological or market changes (or both).

**Overcoming resistance to necessary change.** Inflexible privatization agreements are often a major obstacle to resolving post-privatization regulatory problems and disputes. Such inflexibilities were probably needed during privatization to create commitments to reform, protect consumers, and attract private investment. But they make it difficult to adapt regulation because many parties consider such changes a threat to the privatization commitments that protect their interests—as well as to the entire fabric of reform.

Methods are needed to make needed changes in regulation while honoring the interests embedded in privatization agreement. So, as part of second generation reforms, policymakers in developing and transition economies should develop frameworks for revising regulatory mandates and renegotiating concession contracts. Such frameworks must protect the public interest as well as interests of investors and consumers, and should promote efficient competition (Willig 1999).

**Resolving disputes.** Managing conflicts and resolving disputes are among the most important post-privatization tasks for regulators. Commercial disputes arise in almost every sector of an economy. But because infrastructure industries are so important, disputes between private parties often have significant public interest implications. Thus regulators of these sectors must actively ensure that such disputes are resolved in a way consistent with the public interest.

One area where disputes are arising with alarming frequency and intensity involves the renegotiation of concession contracts. Even well-designed infrastructure concessions require adjustment at some point (Klein 1998b). In Latin America nearly a third of all such contracts were renegotiated within about two years of being awarded (Estache, Guasch, and Trujillo 2003).

Many concession contracts do not have sufficient mechanisms to deal with such post-award adjustments. Moreover, concerns have been expressed about the relative bargaining power of regulators and operators. Due to the importance of basic infrastructure services and the political repercussions of interruptions in their provision, governments are reluctant to terminate concessions—raising the specter of collusion between regulators and regulated firms (Estache and Quesada 2001).

In many countries regulatory and dispute resolution arrangements suffer from serious drawbacks. In the United States, for example, they often entail too many contested administrative proceedings, overly rigid procedures for coping with increasingly complex issues, heavy involvement by courts lacking sufficient technical expertise, and too little flexibility for creative solutions.

Most developing and transition economies have newer, less developed regulatory institutions, enabling them to avoid the procedural complexities and other mistakes of U.S. mechanisms. Policymakers in these countries should explore different institutional approaches and innovative legal process that might be more appropriate given their institutional and legal characteristics.

## Enhancing Consumer Participation in Regulation

Although infrastructure reforms in developing and transition economies have improved the performance of network utilities—sometimes significantly—many consumers remain dissatisfied with how the situation has evolved. This wariness may partly reflect consumers' percep-

tions that they were excluded from early decisionmaking and that even now they have limited opportunities to influence changes in regulation and policy. Thus enhancing consumer participation in the regulatory process is an important second generation reform.

Immediately after privatization, regulatory agencies focused on complex economic, financial, and technical issues such as tariffs, interconnection, technical standards, and licensing and market structure. It is understandable that specific consumer protection policies lagged behind these crucial issues. More recently, however, consumers (in Latin America and elsewhere) have complained about their lack of representation in regulatory processes, tariff decisions, and dispute resolutions (Apoyo Consultoria 2002). If their views continue to be neglected or given short shrift in policy deliberations, it could lead to costly policy reversals—and even threaten the entire reform process.

Consumer participation may be desirable for several reasons. Effective participation could provide a needed counterbalance to the strong influence typically exerted by well-heeled industry representatives. It might also provide regulators with political support and protect them from undue political interference in their rulemaking. Consumer participation in tariff rebalancing would enhance its credibility and might make it more acceptable to the public.

Consumers' lack of technical expertise often constrains their effective participation in the regulatory process. By contrast, regulated firms hire high-powered academic and other experts to argue in support of their views. But this imbalance is slowly being redressed. Consumer organizations in a variety of countries have forged innovative alliances with academic, labor, and other organizations to participate more effectively in the regulatory process (box 1.8).

One of the defining characteristics of state-owned monopolies, especially in transition economies, was their lack of customer orientation. Consumer opinions were rarely considered, and contracts between consumers and infrastructure service providers often did not include consumer protection clauses—meaning that consumers had no way to pursue legal action. As part of their reforms several of these countries have adopted consumer protection measures, mainly consisting of complaint resolution mechanisms and the power to fine operators.

Consumer protection policies can be justified by market failures, including the high transaction costs and asymmetric information problems for individual consumers dealing with large utilities, as well as the market dominance of some of these utilities. But competition and con-

### Box 1.8 Consumer Participation in Colombia's Rulemaking

UNTIL RECENTLY CIVIL SOCIETY HAD ALMOST NO influence on Colombian regulation. Consumer organizations lacked the technical capacity to argue their positions, and regulatory authorities did not offer platforms for citizen participation. Regulatory bodies simply posted proposed rules on their Websites and required that all comments be submitted through the sites.

But in 2000 the consumer organization Consumidores Colombia forged partnerships with several of the country's universities to create an expert group for consumers. This move enhanced the credibility of the organization's participation, especially in debates of complex technical issues. As a result regulators began holding public hearings to learn the views of operators and consumers. Today regulators regularly invite Consumidores Colombia to discuss controversial issues.

*Sources:* Apoyo Consultoria (2002).

sumer protection policies complement each other. Competition enhances consumer choice and leads to more price and service options. Thus there is less need for consumer protection policies once robust competition is established.

Regulatory policy should not favor any particular group of stakeholders, including consumers, over others. Instead it should be neutral and focus on correcting market failures. And although consumer participation in the regulatory process should be encouraged, the temptation to put consumers on the boards of regulatory agencies and give them the power to vote should be resisted, because it will likely conflict with the requirements of regulatory due process and neutrality. Regulatory policy should seek to balance the interests of consumers and service providers—and such a balance would be disturbed if consumers could vote on regulatory decisions, in the same way as if service providers were given voting powers. Still, empowering consumers with information and making their voices heard on important policy issues would reduce regulatory capture and facilitate fair policies in regulated infrastructure sectors.

## Notes

1. This mainly refers to the period after World War II. Until then private ownership in electricity was the norm in many countries in Europe and North

and South America. State ownership spread after World War II for ideological reasons (as in England and France) or because politically imposed price controls drove private firms into bankruptcy (as in Latin America). Similar situations prevailed for railways, trucking, and water in many countries. Telephone services became captive of state-owned post offices in Europe and Japan but not Canada, the United States, or, initially, Latin America.

2. The extent of scale economies in these industries is a matter of dispute. Research on cost structures finds that technical scale economies are weak and that the optimal market structure is often two or more firms. Moreover, network utilities encompass several distinct activities, many of which are structurally competitive or contestable. Thus concerns about market failure due to natural monopoly have been vastly exaggerated. In most countries government policy has been the real cause of monopoly (Joskow and Noll 1994).

3. The poor financial performance of state-owned utilities was a major cause of the fiscal crisis. Thus the cause and effect relationship between fiscal necessity and privatization is fairly complicated. Moreover, the loan and policy conditions imposed by international financial institutions provided a strong impetus for privatization.

4. The extent to which technological change has been undermining natural monopoly varies considerably by sector and by activity within sectors. Such change has been breathtaking in telecommunications (especially in interexchange services), impressive in electricity (in generation and to a much lesser extent transmission and local distribution), modest in transportation, and almost negligible in water.

5. Coverage has generally been much higher in transition economies than in developing countries.

6. The U.S. market for intrastate long-distance telephone services after the divestiture of regional Bell operating companies from AT&T provides a natural experiment for testing whether competition is hampered when an integrated utility is permitted to operate in a competitive market (competitive access option). The regional companies were restricted to telephone operations within the boundaries of local access and transport areas (LATAs). All inter-LATA traffic was to be carried by interexchange carriers such as AT&T, MCI, and Sprint. By 1996 more than 99 percent of lines were equipped for equal access in the inter-LATA market. In contrast, intra-LATA competition was available to only about 32 percent of the nation's lines. Thus the regional Bell companies were extremely effective at delaying the entry of competitors (Faulhaber 2003).

7. A package of policy reforms complemented privatization, including restructuring, regulatory reform, market rules, and competition.

8. Still, even in the United States there is ambiguity about the causal link between performance and regulation. For example, changes in telecommuni-

cations performance may be due to technology as much as liberalization. On the other hand, the sharp recovery in U.S. railways since the early 1980s can easily be traced to changes in regulation.

9. Because telecommunications reform has been extensively analyzed in the literature, this report does not devote a separate chapter to this important infrastructure industry. For recent studies assessing developments in telecommunications, see ITU (2002, 2003); Boylaud and Nicoletti (2002); Fink, Mattoo, and Rathindran (2002); Bortolotti and others (2001); Cave and Crandall (2001); Li and Xu (2001); Noll (2000c); Cowhey and Klimenko (1999).

10. Such popular opposition, possibly fueled by the global economic downturn, is being directed to economic reforms in general. Antiglobalization activists, however, have made privatization one of their main targets.

11. In 1994 Lattelekom was formed as a joint venture between the Republic of Latvia (51 percent) and Tilts Communications (49 percent) and was granted a 20-year exclusivity for fixed-line telecommunications services. Tilts Communications committed to invest $160 million in Lattelekom over a three-year period in return for the 49 percent equity stake. When in 1999 the government of Latvia shortened the Lattelekom exclusivity from 2013 to 2003, Tilts Communications demanded $380 million in compensation. A protracted legal battle ensued, impeding sector development.

12. These percentage changes exaggerate the magnitude of the problem because they reflect extremely low initial prices.