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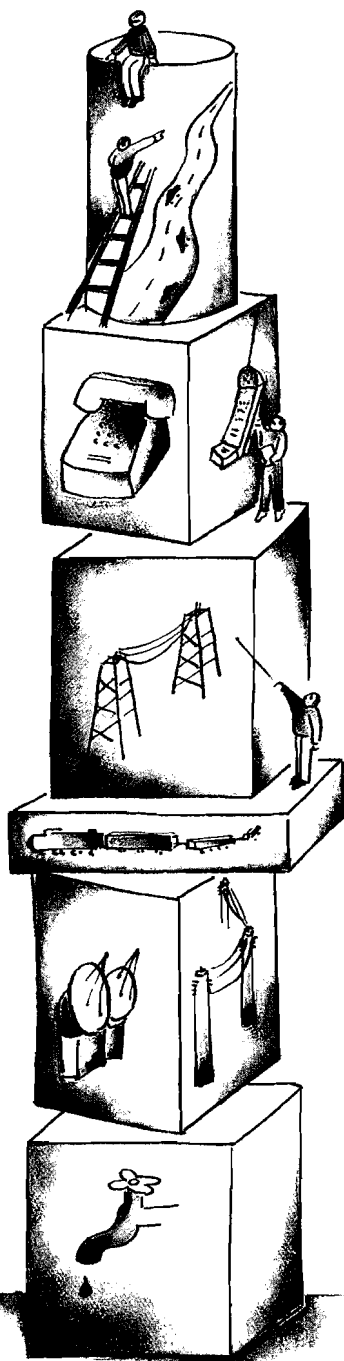
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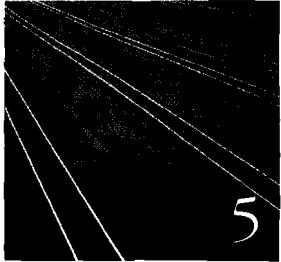
- 45 State-Owned Enterprise Restructuring—Better Performance through the Corporate Structure and Competition

Russell Muir and Joseph Saba



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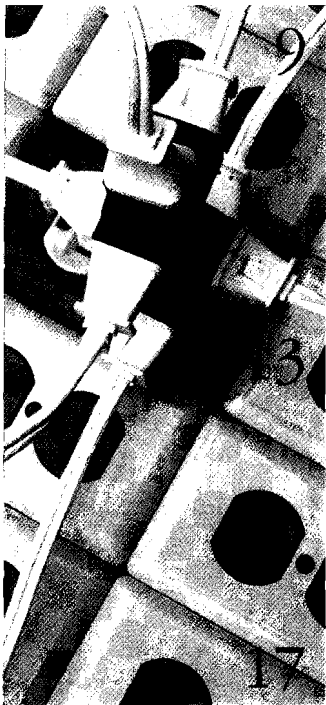




Infrastructure Regulation and Privatization

Restructuring Regulation of the Railroad Industry 5

The rail industry has been one of the most heavily regulated sectors in nearly all countries. But the old public utility paradigm of government regulation is now being blamed for the shaky financial position of most railroads, the deterioration of rail plant, the lack of innovation in the industry, and the poor quality of services. **Ioannis Kessides** and **Robert Willig** outline a new set of regulatory principles—constrained market pricing—that addresses the industry's central regulatory problem, its mix of competitive and monopoly elements.



A Template for Power Reform 9

David Newbery argues that since competition is more effective than regulation in promoting efficiency, separating the potentially competitive parts of the industry from the natural monopoly parts that must remain regulated is good public policy. If this "de-integration" is possible, he says, it should be done, or at least the option should be kept open through continued public ownership of the transmission system. And on the question of privatization, he cites recent experience with power sector reform that suggests that efficiency depends more on the form of regulation than on the form of ownership.

Lessons from Power Sector Reform in England and Wales 13

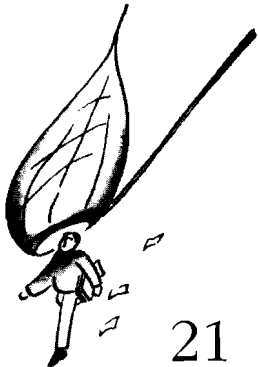
In the power sector reform that started in 1990 in England and Wales, generation was vertically separated from transmission and broken up into three companies. Most of the sector was privatized, and regulation was applied to promote competition and to stop the remaining monopolies from exploiting their advantage. The ultimate goals were to remove the sector from government funding and to reduce prices for consumers through the increased efficiency of private sector operation and the pressure from competition. Although the first objective has been broadly accomplished, the second has yet to be convincingly achieved. **Robert Bacon** briefly assesses some of the lessons starting to emerge.

Private Power Financing—From Project Finance to Corporate Finance 17

In developing countries, limited recourse or nonrecourse project financing has been the solution to the problem of getting credit to power sectors dominated by uncreditworthy borrowers and public agencies. **Karl Jechoutek** and **Ranjit Lamech** predict, however, that the next round of power sector financing will be predominantly balance sheet-driven, a less expensive alternative. They explain what policymakers, investors, and power sector enterprises need to consider in anticipation of this change.

Post-Privatization Performance—Regulating Telecommunications in the U.K. 21

Privatized in 1984, British Telecommunications (BT) is the longest-standing privatized utility in the United Kingdom. Comparing BT's stock market returns over a long period with returns for a comparable sample of firms not affected by regulation, **Antony Dnes** assesses whether the new telecommunications regulatory regime has been captured by consumer groups, BT, or its competitor. He concludes that some regulatory decisions have favored consumers, some have accommodated BT, and some have favored BT's competitor and that, overall, the regulatory regime has checked monopoly power.



Subscribing to Monopoly—The Telecom Monopolist's Lexicon Revisited 25

Wasteful duplication of facilities, uneconomic entry, universal service, and cream skimming are the catchphrases used by many telecom executives, civil servants, and merchant bankers in arguing for continuing telecom monopolies and cross-subsidies. **Peter Smith** explains why their arguments are wrong.

Concessions—The Way to Privatize Infrastructure Sector Monopolies 29

Concession-type arrangements are well suited for privatizing sectors with monopoly characteristics. Under this approach, the state delegates to the private sector the right to provide the service—whether gas, power, water, transport, or telecommunications—but retains some control through a concession contract or license. **Pierre Guislain** and **Michel Kerf** look at the characteristics of concessions and some of their operational implications.

The World Bank Contribution to Private Participation in Infrastructure 33

World Bank operations over the past seven years have included substantial activities in support of private participation in infrastructure (PPI). **Omer Karasapan** shows that, in keeping with its mandate, the Bank has focused primarily on policy-related PPI support—for example, to establish an appropriate legal and regulatory environment—and on the least developed regions, especially Africa.

Update from the Private Infrastructure Database

These two Notes are based on a private infrastructure database being developed in the World Bank. The first editions, published in June, included data collected from 1984 to December 1994. These latest editions reflect data through early September 1995.

The Private Infrastructure Industry—A Global Market of US\$60 Billion a Year 37

The new data show that eighty-six countries have privatized 547 infrastructure companies since 1984, and at least 574 private greenfield projects are under way in eighty-two countries. **Jae So** and **Ben Shin** summarize the activity by region and sector.

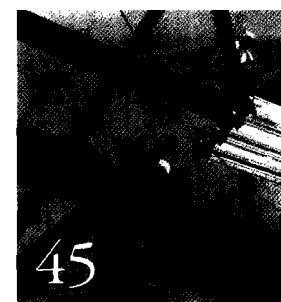
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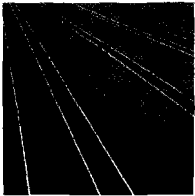
The global private infrastructure industry has experienced rapid growth over the past fifteen years, attracting some 1,700 companies. In the past, infrastructure was generally managed by national single-sector utilities, but technological and regulatory change has allowed companies to cross traditional boundaries. **Jae So** and **Ben Shin** look at the origins of companies in the industry and at their sectoral and geographic diversification.

Restructuring

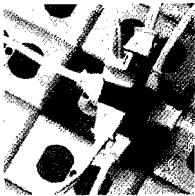
State-Owned Enterprise Restructuring—Better Performance through the Corporate Structure and Competition 45

Countries as diverse as Chile, New Zealand, the Republic of Korea, Sweden, and the United Kingdom have tried, with some success, to reform their state-owned enterprises by imposing on them the same framework of internal and external incentives that applies to the modern private sector corporation. **Russell Muir** and **Joseph Saba** review the steps that appear to be the most crucial in improving performance.





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Restructuring Regulation of the Railroad Industry

Ioannis N. Kessides and Robert D. Willig

Throughout the world, the rail industry has been one of the most heavily regulated sectors. The public utility paradigm of government regulation has failed to handle the central regulatory problem—the mixture of competitive and monopoly elements in supply—and is now being blamed for the poor financial condition of the railroads, for the deterioration of rail plant, for the lack of innovation, and for the mediocre quality of rail services. This Note outlines a set of principles, called *constrained market pricing*, for regulatory reform in the public interest and considers their implications for railroad restructuring.

Catalyst for new thinking

Contestability theory offers a new, improved set of guidelines for appropriate government intervention in the structure and conduct of firms and industries—including sound criteria for distinguishing between cases in which intervention is warranted and those in which it is not. It focuses increased attention on entry barriers and their defining characteristics. Contestability analysis shows, for example, that high fixed costs and the consequent economies of scale, traditionally considered impediments to entry, need not permit excessive prices or profits or any of the other symptoms usually associated with market power. It is the presence of sunk costs, rather than economies of scale alone, that matters for market performance.

In the rail industry, fixed costs are large because of the infrastructure—track, stations, and the like—that must be provided before any trains can run on a route. Duplicating this infrastructure is generally inefficient, so provision of the physical network is characterized by natural monopoly

cost conditions. Because rail infrastructure is of minimal value for other purposes, the fixed costs are largely sunk. These sunk costs of infrastructure create significant entry barriers, especially where there are natural monopoly conditions.

The cost conditions relating to the *operation of services* on this physical network, on the other hand, may be more consistent with active and potential competition. To operate a service, it is necessary to have trains, staff, support, and rights of way. Although hiring staff and buying or leasing rolling stock inevitably involve some sunk costs, they are small relative to the massive sunk costs of establishing network infrastructure. And most of the cost of locomotives and freight cars might be easily and quickly recovered by rolling them to other markets.

Thus, contestability suggests a modulated approach to regulation. In activities subject to effective competitive pressure from the actual (or potential) supply of substitute services, and in markets in which efficient technology does not require significant sunk costs, traditional regulatory constraints should be avoided and open entry and more flexible pricing permitted. And in markets in which the railroad has significant market power, regulation should constrain the prices and terms of services no more (and no less) than the forces of active or potential competition would in competitive or contestable markets. This theory of contestability, together with other advances in regulatory theory and practice, is the basis for the following three principles for railroad regulation:

- Permit a private sector railroad freedom in pricing and operations in services facing effective competition in the relevant market, whether from other railroads, other transport

modes, other origins, other destinations, or other commodities.

- Permit a railroad to set prices that are responsive to differences in demand and in marginal costs and to enter into voluntary contracts with shippers that have individualized terms, conditions, commitments, and compensation mechanisms.
- Permit a railroad to charge “captive shippers,” those over which the railroad has monopoly power, prices that are no higher than the stand-alone costs of the shipper’s service and that do not generate earnings that consistently exceed the railroad’s replacement costs, including a competitive return on capital.

The regulatory challenges

The substantial economies of scale and scope in the railroad industry create several challenges for this regulatory framework. Perhaps the most troubling is the cost allocation problem—the impossibility of allocating, in a nonarbitrary way, a share of fixed and common costs to any one of a railroad’s many activities. There is no way to subdivide those costs in a mechanical fashion that is unique and is founded in economic logic. Historically, regulatory authorities have determined tariffs on the basis of so-called fully distributed costs. Under this method, regulators allocate shared production costs to individual services in terms of some common basis of utilization, such as gross ton-miles.

Fully distributed cost (FDC) pricing suffers from several defects. The most serious one is that it does not necessarily use a causal approach in measuring marginal cost responsibility—taking into account how much costs would increase if more of a particular service were used, or how much they would fall if less of that service were used. Instead, costs are averaged arbitrarily. A further defect of FDC pricing is its neglect of demand data.

Ramsey pricing

FDC pricing frequently “overassigns” or “underassigns” a carrier’s unattributable costs to particular services. If a carrier applied FDC pricing

to all its traffic, it would lose the traffic for which demand could not support the price assigned. The remaining shippers would then be saddled with a larger portion of the carrier’s unattributable costs since they would no longer share those costs with the lost traffic.

Ramsey pricing overcomes this problem by apportioning all unattributable fixed and common costs of the railroad among its services on the basis of their demand characteristics. Each service is priced at a markup over marginal cost that is inversely related to the elasticity of demand for that service. Under Ramsey pricing, it is the shortfall between total costs and the revenues that would accrue from pricing each service at its marginal cost that is apportioned on the basis of demand. Ramsey prices therefore deviate from marginal costs only to the extent necessary to provide adequate revenues—they permit the railroad to achieve revenue adequacy with the least sacrifice of economic welfare compared with marginal cost pricing.

Price ceilings—stand-alone cost

A critical issue for efficiency is the criterion used to set the ceiling on rates where there is market dominance. While rate ceilings derived from fully distributed costs are inimical to the public interest, economically rational ceilings can be obtained from the stand-alone costs. This is the cost of serving any captive shipper or group of shippers that benefit from sharing joint and common costs as if the shipper or group were isolated from the railroad’s other customers. The stand-alone cost method finds the theoretically maximum rate that a railroad could levy on shippers without losing its traffic to a hypothetical competing service offered by a hypothetical entrant facing no entry barriers or by a shipper providing service for itself. Thus, the stand-alone cost criterion serves as a surrogate for competition and leads to a simulated competitive price.

The stand-alone cost test does not apply—and cannot be made to apply without disastrous consequences—if railroads are not allowed to abandon unremunerative facilities or services. Where that freedom is denied, a railroad can-

not earn adequate revenues if its rates on potentially remunerative activities are constrained by stand-alone cost ceilings. For this reason, it is unwise for public policy to limit the freedom of railroads to curtail unremunerative services without providing public funds to help defray the costs of those services.

Options for railway restructuring

The historical model of railway operations is the monolithic organization, where a single entity controls all facilities and operating and administrative functions and determines what services to provide to generally captive markets. The conditions that gave rise to this model no longer exist in most countries, and governments have had to consider a fundamental restructuring of the railway entity and of its relationship with the state. The two main options are vertical separation and competitive access.

Vertical separation

Vertical restructuring options that separate the ownership of facilities from other rail functions, such as train operations and marketing, have recently attracted much favorable attention because they seem to segregate the difficult regulatory problems associated with the largely sunk roadbed costs. If ownership of track and trains is separate—with the track assets held by the government, by a consortium of operators, or by a regulated private entity—there can be vigorous active and potential competition over railway services provided by operators with equal access to the roadbed. This competition would eliminate the need to regulate the operators and give them powerful incentives to provide efficient services that are responsive to the needs of shippers and a growing entrepreneurial economy.

Competitive access

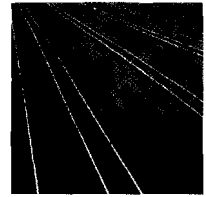
Unlike vertical separation, competitive access permits integrated operations by the rail entity. It implies a requirement that the integrated carrier make its facilities available to other entities on a “fair and equal basis.” If the integrated carrier has strong incentives to keep other entities

out, however, it is unclear how effective an equal access mandate is likely to be.

If the integrated carrier is regulated in a way that permits it to charge higher prices to captive shippers the more of their business it has, it would have an incentive to exclude other participants. Similarly, if regulation limits the amount the integrated carrier can earn from the share of service it provides when it does cooperate with other entities, the carrier would have an incentive to undermine or avoid efficient cooperation in order to enlarge its share of the service. The integrated carrier would also have an incentive to exclude an efficient participant if by doing so, the carrier, acting in a predatory manner, could weaken the potential entrant’s ability to compete in another market. Under classic rate-of-return regulation or under a system of regulated “divisions” that specifies what an integrated carrier can earn from an activity in which there is cooperation, an integrated carrier does have incentives to undermine efficient cooperation.

In sharp contrast, under constrained market pricing, an integrated carrier would generally have a real profit motive to cooperate with an efficient participant in its business. Under this system, “divisions” are not specified by regulation—even on service provided to a captive shipper. Instead, the stand-alone cost ceiling applies to the price charged to the shipper, and cooperation with an efficient entity enlarges the pot of returns available from the service, allowing the integrated carrier to earn more money rather than less. Consequently, except for the rare possibility of predation, an integrated carrier would have ordinary business incentives to find and to cooperate with efficient participants in its business and to negotiate mutually beneficial terms with them. This is just a railroad version of “make-or-buy” decisions in other industries.

Despite the incentives for efficient behavior by integrated carriers provided by constrained market pricing, it is useful and wise to augment the system of regulation with a fallback set of standards to apply if disputes about predation through competitive access should arise. These



standards would be based on the principle that an integrated carrier that possesses a “bottleneck”—a facility without which the competitor cannot offer its services—should not refuse an agreement that provides for full compensation of all its costs, including opportunity costs.

Efficient component pricing and *parity pricing* are both names that have been given to the principle that an integrated carrier should offer the services of its bottleneck at a price that yields it the same return as if it had performed the end user's service itself. Behavior consistent with this principle leads to efficient vertical relationships and is thus consistent with nonpredatory incentives under the constrained market pricing rules. Such pricing of bottleneck facilities does not place additional competitive pressure on pricing to shippers, since it is based on the return that could be earned from the shipper's service at the extant price. But it does generate incentives for supplying an efficient combination of transport services, it does provide quality and cost competition among potential and actual participants for supplying part of that efficient combination, and it does help to ensure that those with efficient innovations in logistics or in marketing transport services will be able to work with carriers to implement their ideas.

Separation versus competitive access

The primary virtue of separation as a policy option is that it may ensure active or potential competition among rail operators or retailers—and efficient selection among them for provision of their services. However, prices are unlikely to be fully Ramsey-efficient for the coverage of replacement costs, because of the difficulties of reflecting the differences in shippers' demands in the prices charged for infrastructure services. At the same time, separation may create serious coordination problems, loss of economies of scope, and otherwise unnecessary transactions costs. In addition, in thin markets rail operators may not face effective active and potential competition, undermining the potential for realizing the primary benefit of this option.

Separating track assets from operations is likely to be a particularly attractive option where a dense and extensive rail network permits many operators to function, ensuring both active and potential competition. It is also likely to work well where fixed facilities are mature and well developed, limiting the domain of new infrastructure investments, where incentive problems are more likely to arise. Where fixed facilities are not well developed, regulation of the infrastructure entity should permit it to enter into medium- or long-term contracts with shippers or with operators that themselves have contracts with shippers, so that the risks and rewards from investments can be efficiently shared by shippers, operators, and the infrastructure entity. If the infrastructure entity is expected to seek recovery of its replacement costs, it should be permitted and even encouraged to use price discrimination to help bring shippers' prices into line with principles of Ramsey efficiency.

The competitive access option could also be fraught with problems if the incentives of bottleneck holders are adverse to efficiency and competition. But under rail regulation that focuses on the rates charged to shippers rather than on other prices, such as those charged for access to bottleneck services, incentives generally promote efficient vertical relationships. As a result, if integration is permitted under this system of price regulation, the outcomes are predictably consistent with efficient participation by the integrated carrier and by other, nonintegrated carriers, on terms that permit compensatory support for the efficient participants. Further, prices to shippers can be selected in accordance with Ramsey efficiency, even as they are constrained by regulation where the carrier has monopoly power.

This Note is based on a chapter by the authors in Claudio Frischtak, ed., “Regulatory Policies and Reform: A Comparative Perspective” (World Bank, Private Sector Development Department, Washington, D.C., forthcoming). To order, contact Cindy Wong at (202) 473-3606 or by email (cwong@worldbank.org).

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A Template for Power Reform

David M. Newbery

In the electricity supply industry, high-tension transmission and low-tension distribution systems are natural monopolies, but generation is potentially competitive. Because competition is more effective than regulation in promoting efficiency, separating the potentially competitive parts of the electricity supply industry from the natural monopoly parts that must inevitably remain regulated is good public policy. But the potential for this kind of industry reform will vary by country—depending on whether the system is government owned, investor owned, or under mixed ownership. If a country can de-integrate its electricity supply industry in this way, however, it should do so, or at least keep the possibility open through continued public ownership of the transmission system. And to create effective competition, governments should privatize generation—and possibly distribution—to pave the way for a market in bulk power. This Note provides a template for such industry reform.

The regulatory problem

A natural monopoly arises when a single firm can provide a range of goods or services at lower cost than a set of firms. Electricity networks are natural monopolies in this sense. Moreover, their monopoly is in the supply of a necessity, and they have a direct connection to consumers. This combination of necessity and direct connection implies large potential exploitative power and ensures that regulation or public ownership is politically inevitable. Investors in the electricity industry must therefore expect limits on the prices they can charge and sometimes onerous obligations relating to safety, supply, and stability. In exchange, though, investors need reassurance that future prices will be set high

enough to justify their investment. Experience, however, shows that the politics of pricing are often heated. For social reasons, many governments have set unremunerative prices, and many have failed to index public utility prices adequately to offset the effects of inflation.

Therefore, to give investors the confidence to tie up money in an investment that might not pay off for years, governments must reassure them that the rule of law—specifically property law—is sufficiently strong to ensure property rights. And to reassure consumers and investors, a regulatory system must set rates satisfactory to both. Investors, in turn, must coordinate investment in transmission and generation to find least-cost ways to expand the system and to prevent system failures, fuel shortages, and price shocks. And because electricity is vital to production, they need to reassure governments that supplies will be available at all times. How to satisfy this set of objectives constitutes the regulatory problem.

What industrial countries have done

The history of the electricity supply industry in different countries illustrates the variety of solutions that have been found to the regulatory problem. The solutions are of three main types. The industry may be entirely publicly owned, and thus subject to direct political control; it may be entirely private, but regulated explicitly or implicitly; or it may be a mixed system in which the private sector is implicitly controlled by the potential of the remaining publicly owned system to take over its function.

The simplest structure is a publicly owned national monopoly such as exists in Belgium,

A GLOBAL FINANCING PROBLEM

Industrial countries' demand for electricity increased sharply after World War II. Improvements in reliability and high but falling electricity prices financed the huge investment programs needed to meet demand and to modernize generation and transmission. Until the oil shocks of the 1970s and growing fear about nuclear power, therefore, public criticism of the power sector was muted.

In developing countries, the electricity supply industry was almost invariably state-controlled, with international organizations such as the World Bank helping to meet investment requirements. In 1984–91, nearly 9 percent of official development finance went to the power sector, and power accounted for about 15 percent of World Bank lending until 1991. In the 1980s, infrastructure accounted for more than 55 percent of public investment in middle-income countries, and roughly 40 percent of that share—or a quarter of total public investment—went to power. Official development assistance financed about 10 percent of the annual power sector investment—roughly US\$80 billion—and the World Bank financed about 3 percent.

France, Italy, and Portugal and used to exist in England before 1990. Austria, the Netherlands, and Spain have de-integrated their industries to varying degrees and formed cooperative power pools that dispatch in order of cost. In the Netherlands, four regional generation companies own the grid and the dispatch company, and the industry draws up plans subject to government approval. In Spain, the grid is under public control, and the government determines the investment plan. And in Austria, the national power company owns the grid and also has ultimate responsibility for ensuring supply, but coordination of power sector investment is decentralized.

Unlike most other European electricity supply industries, those in Germany and Switzerland are complex and fragmented. This reflects the federal structures of these countries and the fact that, because their power sectors were not nationalized, they have not been restructured. The Scandinavian electricity supply industries are under mixed public and private ownership and are largely self-regulating, coordinating electricity supply through cooperation and negotiation.

The performance of the state-run power sectors was frequently unimpressive—particularly when high inflation followed the oil shocks of the 1970s. Despite excess demand, prices hovered below long-run marginal costs, and the rate of return fell so that profits could not finance needed investments. In 1991, with only 60 percent of power sector costs covered by revenues, self-financing ratios fell to only 12 percent of investment requirements. In fact, by the late 1980s, continuing in this vein was no longer financially feasible for utilities or for governments, especially in Latin America. Fundamental sector reform (including privatization) was proposed as the solution. In 1978, Chile had begun radically restructuring its electricity industry as a prelude to privatization. Deregulation was on the agenda in the United States, with modest beginnings in the power sector under the Public Utilities Regulatory Policies Act of 1978. But the pace quickened with the simultaneous restructuring and privatization of the electricity supply industry in the United Kingdom in 1990–91. This reform demonstrated the importance and feasibility of restructuring the industry and changing the system of regulation, usually as preconditions for privatization (though, as Norway shows, this last step is not logically implied by the first two).

Structural choices and the design of regulation

Reforming the electricity supply industry in countries with nationalized industries (owned and controlled by the central rather than the local government) raises different problems than in those with private (investor-owned) industries or mixed systems. Governments without direct control over assets will be constrained in regulatory reform by the rights of the existing owners. Radical restructuring is far easier under public ownership, although in countries with unclear or overlapping property rights (of workers, local municipalities, and ministries), it may require clarifying the state's control over the industry. For countries undertaking reform, advisers will need to answer the following questions: How should the industry be structured? Which parts should be public and which private? And which parts should be regulated and how?

Industry structure

Since generation is potentially competitive and transmission is a natural monopoly, separating

the ownership of the two systems might allow competition to effectively take the place of regulation in generation. But for competition to be effective, there must be enough independent generators actively competing in setting the price. This active competition may be difficult to achieve if new power stations are large relative to the total capacity of the country or if the transmission system is unable to ensure adequate competition in each region. If competition fails to keep prices low, regulation may be necessary.

When generation and transmission are integrated, only the delivered power price needs regulation. But if transmission is separate, charges for access to and use of the transmission system will need to be regulated to ensure efficient generation in the short run and efficient choices in plant type and location in the long run—a challenging task.

Some of the considerable benefits of competition in generation can be achieved by inviting competitive tenders for the construction of new plant, built and operated under long-term contracts with the transmission company. But vertical de-integration offers potentially greater benefits. It creates competitive pressure at stages where entry is feasible, and it may result in overall improvements in efficiency sufficient to offset the inefficiencies of transactions through the network. Vertical de-integration also hinders cross-subsidization and makes pricing more transparent.

Given these considerations, what course should be taken by a government contemplating a potentially radical restructuring of the industry? Such opportunities are rare and should not be wasted. The guiding principle should be whether the proposed reform forecloses options or keeps them open. If de-integration is possible, a government should choose that course—or at least keep that option open through continued public ownership of the transmission system. Continued, centralized public ownership keeps most options open, but municipal ownership appears to create obstacles to further reform, at least in some political systems. Reforming a privately owned, vertically integrated generation system appears most difficult, because it requires over-

riding private property rights or paying expensive compensation. If generation is to be transferred to private ownership, transmission should be kept separate, perhaps initially in public ownership, or as a separate company with restrictions on control by generators or by large users or distributors.

Public or private ownership?

Most studies comparing the performance of private electric utilities with that of publicly owned utilities conclude that there is little difference in technical or cost efficiency, though very recent studies indicate better performance under private ownership.

. . . experience suggests that efficiency depends more on the form of regulation than on the form of ownership.

In the United Kingdom, privatizing the generators and forcing them to compete in the bulk electricity market doubled labor productivity in three years and improved control over investment costs. The publicly owned Nuclear Electric and British Coal, both forced to sell in markets where there was competition from private firms or imports, also improved their productivity dramatically. In Argentina, generation availability improved within a short period after privatization, with Central Costanera increasing availability from 20 percent to 50 percent and doubling its output. Norway introduced competition in the bulk electricity market and in 1993 created Statnett Marked (as a subsidiary of the state-owned owner of the transmission system, Statnett) to operate the power pool, without altering the ownership structure of the industry. The result has been substantial trade across former franchise boundaries and decreased dispersion of prices. In due course, the Norwegian reform should provide a good test of whether, in creating contestable power markets, it is more important to restructure the industry or to privatize it. Note, however, that the Norwegian system allows private generators to

compete with state and municipally owned systems. In the United Kingdom, as in Argentina and Chile, distribution companies remain natural monopolies, and the rate of improvement in their performance has not changed markedly since privatization—although neither has it deteriorated. Altogether, this experience suggests that efficiency depends more on the form of regulation than on the form of ownership.

Criteria for regulation

A good system of regulation should do two things. It should enable a utility to raise finance for investment at an acceptable cost. And it should provide incentives for efficiency in operation, pricing (and thus use), investment (in choice of type, location, size, and cost), and innovation. These requirements may conflict, however. Rate-of-return regulation guarantees an adequate return on capital and thus enables a utility to finance investment cheaply, but it gives little incentive to increase efficiency. Price cap regulation does provide good incentives to reduce costs. But by increasing profits, it ends up creating pressure to tighten price regulation, which increases regulatory risk and raises the cost of investment. Regulatory reviews must be carefully designed to ensure investor confidence and continued political support. The U.K. solution is to grant licenses to the utilities that clearly specify their rights and obligations and can be defended or enforced in the courts.

Creating competition

Creating effective competition requires separating transmission from generation and privatizing generation (and possibly also distribution) in order to create a market for bulk electricity. This restructuring has far-reaching effects on the relative price structure, reducing the ability to cross-subsidize and putting competitive pressure on fuel supply industries, making subsidies harder to justify. Paradoxically, when costs fall as efficiency increases, labor is shed, and costly fuels such as coal and nuclear are replaced by gas, prices may rise as subsidies to capital and fuel are removed. If demand growth resumes

and new investment in transmission and generation is required, prices will need to be adequate to reward private investors.

The major challenge in designing regulation for a de-integrated industry is to provide adequate assurances of investor protection, so that the necessary expansion will take place, while preserving the benefits of market competition. Policymakers must ensure that the bulk electricity market is adequately competitive to avoid a need for the burdensome regulation that undermines investor confidence.

Priorities in developing and transition countries

In developing countries, the main problem is to improve the financial and economic performance of the industry—by rebalancing tariffs, eliminating costly interruptions in supply, reducing construction and operating costs, and avoiding construction delays. Private investment in generation—and possibly in transmission and distribution as well—looks attractive on all scores, as long as entry is competitive and the regulatory environment keeps risks and costs low. The evidence from Chile in particular—where regulatory reform and the restructuring of state enterprises occurred first and privatization proceeded quite slowly—shows the importance of creating a sound, independent system of regulation, commercialization, and competition, even for state-owned utilities, and the relative unimportance of rushing into privatization. In Eastern Europe, efforts to privatize utilities to reduce public debt have been hampered by low tariffs and unsatisfactory regulation. Solving these problems would remove the financial urgency of privatization.

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Lessons from Power Sector Reform in England and Wales

Robert Bacon

The 1990 power reforms in England and Wales were designed to permit the introduction of competition at both the retail and the wholesale level. Generation was both vertically separated from transmission and horizontally separated. The sector was almost completely privatized—only the nuclear capacity was left in public hands—and regulation was applied both to promote competition and to ensure that the remaining monopolies did not exploit their advantage.

The new industry structure emerged with three generating companies: National Power (52 percent of capacity at that time) and PowerGen (33 percent), which were privatized, with 60 percent of their shares sold initially, and Nuclear Electric (15 percent), which was left under public ownership. National Power's share of capacity gave it significant market power. The national grid company—after separation from the generating companies—was transferred to joint ownership by the twelve privatized regional distribution companies. (The grid company retains control of dispatch.) Each of the twelve regional distribution companies (RECs) has two separate functions—distribution (through low-voltage wires or, more simply, grid to door) and retail supply (the sale of electricity to final customers)—and these functions must be accounted for separately. Access to the distribution operation of the RECs is regulated so that any seller of electricity has the right to “use” the associated distribution network when selling to a final customer. Until March 1995, the government retained a “golden share” in each REC, giving it the power to block any takeover or merger.

Five years have now elapsed since the reforms began—and this Note discusses some of the lessons starting to emerge.

A framework for retail competition and regulation

The reforms sought to foster retail competition by allowing an increasing number of consumers to shop around for the best service. To start this, final consumers were divided into three classes:

- **Small.** Consumers with peak demand of less than 1 megawatt (MW) are “franchise customers” who must buy from their local REC. This limit was reduced to 100 kilowatts (kW) in 1994 and is scheduled to be abolished in 1998. RECs have an obligation to serve this group of consumers at regulated prices.
- **Medium.** Consumers with peak demand of 1 to 10 MW have a “right to tariff,” but they can also purchase at unregulated prices from the “second-tier” suppliers—firms with a license to sell (mainly the other RECs and the generators). Of the approximately 4,000 customers in this class (30 percent of total demand), 40 percent were using a second-tier supplier by 1993.
- **Large.** Consumers with demand exceeding 10 MW have no right to tariff. Instead, they have to negotiate their prices with the supplier they choose.

This market structure has a mix of regulated and unregulated prices, but even the unregulated prices are subject to oversight by the regulator in his capacity as promoter of competition. The prices for supply to final consumers are controlled by the price cap formula— $RPI - X + Y$, where RPI is the rate of inflation, X is the estimated potential productivity gain, and Y is a passthrough factor made up of transmission charges, distribution charges, electricity purchase costs, and a fossil fuel levy that subsidizes nuclear power. The factors covered by passthrough account for about 95 percent of the total costs of supply.

The distribution charges account for just over 20 percent of the final price. The initial distribution price caps ranged from $RPI+0$ to $RPI+2.5$ among the RECs, implying that the prices at vesting were seen as inadequate to cover future costs. Transmission charges, which account for about 4 percent of final prices, are regulated through a price cap for which X was initially set at zero.

Wholesale markets—the power pool

The most innovative reform was to the pricing of power sold by the generators to the RECs or to large final users. The generators sell all power to a pool. In this power pool (operated by the national grid company), generators bid to supply various units in half-hour slots during the next twenty-four hours. Dispatch is carried out by choosing plants in merit order of these bids, up to the point at which demand is satisfied.

The price the generators receive has three components: the system marginal price (SMP), the highest price bid by dispatched plants; the capacity payment, the loss-of-load probability (LOLP) times the value of lost load (VOLL) less the SMP; and the uplift, an adjustment to cover the costs imposed by transmission constraints, standby capacity, and the like. The pool attempts to mimic an unregulated market, but in fact it includes a strong degree of regulation (especially in the setting of the VOLL). To protect themselves against the potential variability of pool prices, generators and suppliers have entered into a series of short-term “contracts for differences” that allow both parties to manage the risks caused by uncertainty about pool prices.

Volatile pool prices

The new structure of the generation market immediately attracted attention. Pool prices fluctuated sharply and, paradoxically, occasionally rose during times of low demand. For example, while the yearly average was about 2 pence per kilowatt-hour (kWh), the price for three half-hour slots reached 16 pence per kWh on a sunny September afternoon in 1991 and spiked to 33 pence per kWh during December.

The regulator quickly reviewed pool prices and concluded that the generators could raise prices above marginal costs in at least two ways. First, they could declare some plant unavailable and thus affect the LOLP by reducing supply relative to demand. Later, after the dispatching schedule had been determined, they might even declare this plant available. Because of the huge difference between the typical SMP and the VOLL, a small increase in the LOLP has a large effect on the pool price. Second, the generators could manipulate the uplift factor. Because of transmission constraints, certain power stations were optimal to dispatch even when their price was well above that of the marginal station bid in to meet the demand. The generators soon learned to set the bids for these stations well above costs.

To prevent the withdrawal of plant that was actually available, the regulator appointed an independent assessor. The price spikes disappeared, but big industrial users continued to complain about the general level of prices. Rather than refer the generators to the Monopolies Commission, whose decision could have involved restructuring—a decision that would have been seen as betraying the shareholders—the regulator in 1994 accepted undertakings by the generators. The generators specified that they would bid into the pool so that the pool price would average about 2.5 pence per kWh for the next two years, and that they would dispose of another 6 gigawatts (GW) of capacity within two years. The pricing agreement amounted to a 7 percent cut in real prices over the previous year. This capping of pool prices cannot be a permanent solution for a market designed to be competitive, however. The regulator probably expects that new investment will help to make the market more competitive over time.

RECs' profits and shifting structures

In the past two years, the RECs have come under public attack because of their continuing high profits and the large salary increases (boosted by share options) for top executives (table 1). (Profits in generation, though substantial, have not been attacked as excessive, and

**TABLE 1 PRETAX PROFITS AND REVENUE OF THE POWER SYSTEM
IN ENGLAND AND WALES, 1992/93**
(millions of pounds)

Company	Pretax profits	Revenue
National Power	580	4,348
PowerGen	425	3,188
Nuclear Electric	661	1,400
GridCo	350	1,396
RECs		
Distribution	1,042	3,751
Supply	— ^a	13,921

a. The companies had small profits or losses.

Source: Mark Armstrong, Simon Cowan, and John Vickers, *Regulatory Reform: Economic Analysis and British Experience* (Cambridge, MIT Press, 1994).

supply has been the least profitable part of the electricity business.) The RECs have been only lightly regulated, with the result that growth in their profits has averaged up to 30 percent a year. Following the first scheduled review of the price cap for distribution in 1994, the RECs had to reduce their charges by 11 to 17 percent in 1995–96, and thereafter an *RPI-2* price cap was to be used until 1999–2000.

The rapid growth in the profits of RECs made them attractive targets for takeover. In December 1994, anticipating the expiration of the government's golden shares preventing takeovers, Trafalgar House bid £1.2 billion for Northern Electric (about four times its selling price at privatization), or £10.81 a share. Northern Electric responded by offering its shareholders a package worth £5.07 a share to reject the bid, provoking more public criticism. The temperature rose further when, in early 1995, the government sold its remaining 40 percent of shares in the two privatized generators. On the day after the sale, the regulator announced that the distribution review had not been completed and that he would be considering tightening the price caps. This announcement created a political storm, with the government being accused of insider dealing. And although new price caps were soon announced that further cut real prices over the next few years, takeover activity has continued, suggesting that investors still expect a good return from what is a low-risk business. Clearly, the government could have held out for a higher price at the time of privatization.

The RECs have made substantial new investments in generation—in a “dash for gas”—despite the overcapacity at the time of privatization. By 1993, they had interests in 5.4 GW of plant (mainly combined-cycle gas turbines) under construction or in operation. Diversifying supply has given them some protection from the market power of the generators. But because the price cap formula allows them to pass through all costs of purchasing electricity, they have a weak incentive to seek the cheapest source of supply, despite their obligation (to the regulator) to do so.

By 1995, the RECs were considering selling off the grid, suggesting that there was no great advantage in having left this vertical link at the time of privatization (generators are not allowed to own shares in it, though, to prevent anti-competitive links). Because the market value of the grid (£5 billion) appears to be considerably higher than that used at flotation (the RECs were sold for only £8 billion), the possibility of returning to final consumers part of any profits from its sale has been raised.

An assessment

The ultimate aims of the U.K. reforms were to remove the sector from government funding and to reduce prices for consumers through the increased efficiency of private sector operation and the pressure of competition. Broadly speaking, the first objective has been accomplished, but the second objective has yet to be convincingly achieved. Many of the difficulties in achieving this second objective are related to the speed with which the restructuring and privatization had to take place. The political pressures at the time allowed a relatively short “window of opportunity,” but the desire to privatize the whole system and to introduce as much competition as possible demanded the creation of entirely new market forms for the industry. So some of the reforms are still under way. Shifting to an open power pool with continuous bidding and introducing retail competition in the second-tier market, for example, are both highly complex

reforms that take time to achieve, and the operation of these markets is still evolving.

The drop in the franchise limit to 100 kW initially created severe accounting problems because many potential customers lacked the special meters required to trace their usage through the day. Introducing retail competition in this segment of the market appears difficult if, as in England and Wales, the regulator is not given the responsibility and power to oversee expansion of this market. Metering is expensive, and the cost may not be worth it below 75 kW. Despite the vertical integration between transmission and distribution and between distribution and supply, there is no evidence that distributors hindered second-tier access to consumers in their region. This suggests that here the regulatory threat was effective—though possibly because the RECs did not wish to draw attention to their profits.

As it turns out, new investment in generation has been slow to have an effect on competition, and the dominant generators still have considerable market power. Partitioning the sector into smaller units and reducing the market share of the largest generator at the time of privatization would have helped create competition faster. Changing the structure of the industry or the general rules of the game after privatization is extremely difficult politically, because purchasers accept the terms of the privatization on the basis of the status at the time of privatization. Shareholders inevitably would claim that they had been cheated.

A striking trend in the system is the movement toward reintegration. Market forces are pushing distributors to consider merging with one another, to ward off threats of takeover from outside the industry by taking advantage of economies of scale. Vertical reintegration is also occurring as distributors purchase their own generating capacity. In addition, one of the generators is bidding to acquire a REC. The takeover movement, inevitable in mature stock markets when large profits are visible, will substantially complicate the formal regulation of the

industry by making it harder for the regulator to identify the true costs of distribution. But a government cannot adopt a market-based system and then expect the structure to be set in stone.

The use of *RPI-X* price caps in the U.K. system has already yielded substantial experience. Price cap regulation was chosen to avoid the lack of incentive to reduce costs in a cost-plus (rate-of-return) regulation formula, and the regulatory process was designed to give the companies an assured period between regulatory reviews in which to look for cost savings greater than the *X* factors. But the regulator has been forced to intervene between scheduled reviews and to investigate the actual and potential returns to capital for the companies, moving the system toward the criteria used in U.S. rate-of-return regulation. The initial failure to set a reasonable price cap for the distributors has proved expensive for the consumer. Moreover, subsequent experience with setting price caps shows how difficult it is to correctly assess the level of productivity that can be obtained in the distribution sector. Prices have fallen relative to costs, but few of the efficiency gains have been passed on to consumers. Only time will tell whether this problem is transitory or reflects a basic weakness. Given the tendency toward large profits in the system, a form of regulation that provides a formula for sharing excessive profits with consumers may well emerge.

The regulator has come under enormous pressure. He has been made a scapegoat for sub-optimal decisions made by the government at the time of privatization, a predicament illustrating the need for a strong and independent regulatory commission. The regulatory reviews show the difficulty of the regulator's task. Each REC assembled its own regulatory team and produced massive documentation to support their own assessments of the desirable price caps. The relatively small size of the regulator's office and its broad responsibilities clearly worked to the advantage of the companies.

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Private Power Financing—From Project Finance to Corporate Finance

Karl G. Jechoutek and Ranjit Lamech

Limited recourse project financing of power generation projects has been widely promoted as a solution to the intractable problem of getting private credit to a sector dominated by noncreditworthy borrowers and public agencies—from the point of view of both those supplying capital and those needing it. When the lights are going out, incumbent power enterprises are financially unviable, and the public purse is nearly empty, project financing of independent power producers (IPPs) may seem the only way to get new capacity fast. In the developing world, however, the public-private partnership in project-financed IPP ventures has been disappointingly slow to produce results.

This Note argues that, to achieve substantive progress in IPP financing, limited recourse project financing will have to evolve toward structures with greater balance sheet support. The need for corporate balance sheet support for private power sector investments is gradually being recognized, and the benefits of this shift in financing structure are worth reflecting on. First, balance sheet support by the main partners in an IPP financing offers greater security to lenders and provides easier (and perhaps cheaper) access to long-term debt—critical to sustainable power sector financing given that IPPs typically depend on debt for 60 to 75 percent of their financing requirements. Second, while equity in limited recourse project finance is almost exclusively private, balance sheet support by IPP sponsors can open access to public equity markets, which are deeper and generally cheaper. Third, increased corporate balance sheet support is a corollary to the restructuring in the world's power sectors. As sector unbundling and self-generation expand choice for wholesale and (potentially) retail

consumers, and thus increase demand uncertainty, balance sheet support by IPPs will play an important role in sharing demand risk among key participants.

Project finance is more expensive for an IPP

Project finance implies that the lenders to a project have recourse (or claim) only to the project's cash flows and assets. In effect, then, the project is financed “off the balance sheet” of the project sponsors. Such project finance is termed *nonrecourse* and is at one extreme of the project finance–corporate finance continuum of financing possibilities. In practice, project finance in developing countries is backed by sponsor or government guarantees provided to give lenders extra comfort. This is *limited recourse project financing*, involving at least a small degree of corporate or balance sheet support.

In traditional corporate financing, at the other extreme of the financing continuum, lenders rely on the overall creditworthiness of the enterprise financing a new project to provide them security. If the enterprise is publicly held, information on its performance and viability is usually available through stock markets, rating agencies, and other market-making institutions. This combination of security, liquidity, and information availability allows debt to be issued at a lower cost than through project finance. Further, because the enterprise's overall risk is diversified over all the activities that it is engaged in, the cost of equity is also usually lower. The financing advantage for both debt and equity makes the overall *cost of capital* lower for corporate finance.

Systematic empirical evidence specific to the power sector in the developing world is lacking, but anecdotal evidence suggests that corporate finance is indeed cheaper than project finance. Corporate financing also has significant transaction cost advantages because it avoids the high cost of negotiating the web of carefully structured legal contracts with purchasers and commercial lenders necessary under project financing.¹

The IPP experience in the United States offers useful insights, and indicates that the project-financed independent generation model may not necessarily be the most efficient mode for capital formation in generation. Nor is it the dominant mode in other countries. The United States pioneered generation by independent operators on a merchant basis, and it is where the now ubiquitous term *independent power producer*, or IPP, originated. Project-financed independent generators have thrived in the United States, contributing more than half the additions to generation capacity in recent years. It has been shown that the cost of capital for a purchasing U.S. utility may be higher if it chooses to build its own generation capacity rather than purchase power from an IPP.² But much of the advantage is due to the adversarial regulatory environment in the United States, which favors IPPs. Purchasing utilities weigh the risk that state regulators will disallow investment costs against the perceived lower risk (and lower profits) of purchasing electricity from an IPP, an arrangement in which all costs can be passed through or expensed. The preference for purchasing power from IPPs is easily rationalized when one notes how many utilities and their bondholders were hurt in the 1970s and 1980s, when regulators disallowed cost recovery for large investments in capacity.

Increasing balance sheet support for IPPs—The evidence

Project developers operate in a fiercely competitive market for international projects. Assuming competitive bidding, the primary source of competitive advantage lies in the ability to

find financing at the lowest cost, as differences in technical and operating abilities become virtually indistinguishable among the front-runners. (Other attributes may, however, predominate in negotiated, noncompetitive IPP deals.) In the competitive international IPP market, several trends indicate that balance sheet support is the preferred means for achieving this cost-of-capital advantage.

Raising capital using a parent's balance sheet

Project developers are putting their own balance sheets at risk—or those of their parent companies—to raise cheaper debt for projects and to finance their equity contribution. Projects in which sponsors have used their own balance sheets to raise finance include the Puerto Quetzal project in Guatemala (Enron), the Puerto Plata project in the Dominican Republic (Enron), and the Upper Mahaiao and Mahanagdong projects in the Philippines (California Energy). Chinese IPP developers, such as Huaneng Power and Xinli (Sunburst Energy), an affiliate of CITIC, have also used this strategy. California Energy pioneered the largest corporate financing in the independent power business, raising US\$530 million through ten-year securitized bonds in March 1994.

Creating consolidated balance sheets

Developers are pooling projects into entities that are then able to raise capital on the strength of a combined balance sheet comprising the “pooled” assets of the different projects. Providers of equity and debt then finance the business of building and operating private generation facilities rather than an individual power plant. Pooling spreads project risk. For a multinational developer, it also reduces country-specific risk. And for a developer with a few projects already under commercial operation, corporate finance obtained through pooling is an important source of revenue for repaying debt and paying dividends.

Pooling has two other benefits. First, it enables project developers to tap *public* equity mar-

kets—most private project developers finance the equity component of a project privately. Second, it enables developers to raise cheaper debt on a corporate finance basis. IPP sponsors that have used this approach include Consolidated Electric Power Asia (CEPA), the San Francisco-based Bicoastal Energy Investors Fund (EIF), and Huaneng Power International (HPI) of China. CEPA raised debt and equity in the capital markets on the basis of its corporate strategy of building multiple power plants in Asia. EIF securitized its equity interests in sixteen independent power projects in the United States, creating a synthetic balance sheet and issuing US\$125 million of seventeen-year bonds. And HPI, which owns 2,900 megawatts of capacity under commercial operation and has another 5,900 megawatts under construction, raised US\$332 million by listing its IPP business on the New York Stock Exchange in October 1994.⁵

Pursuing mergers and acquisitions

Industry consolidation has become a steady trend in the IPP business. Notable transactions among international players include the purchase of CMS Generation by HYDRA-CO Enterprises, the purchase of Magma Energy by California Energy Inc. (creating an enterprise with annual revenues exceeding US\$400 million), and the acquisition of J. Makowski Co. Ltd. by PG&E Enterprises and Bechtel Enterprises to form International Generating Co. Ltd. It has been argued that the increasing size and scope of projects is the main factor driving this change. Smaller companies are at an important disadvantage in international capital markets compared with larger players, with their greater experience, capitalization, and track records. Although these mergers and acquisitions could be driven by a number of strategic objectives, increased balance sheet support in project development is clearly one of them.

The IPP financing challenge

Private financing needs to be tailored to the changing structural relationships in the sector.

Core generation, transmission, and distribution functions are being separated, competition is being introduced in wholesale and retail markets, and technological progress is rapidly increasing the number of cost-effective options for decentralized self-generation or cooperative generation. This restructuring will require a redefinition of the underlying assumptions in power sector financing.

The financial challenge will be to find ways to provide lenders with adequate long-term revenue security when the new industry structure might not allow utilities to guarantee demand risk and price risk for the maturities required. Traditional project finance is based on allocating demand risk to the purchaser, whether an integrated utility, a central generator and purchaser, a distribution utility, or a large consumer. This risk allocation works well because purchasers have a monopoly franchise area, which they are obliged to serve. But as direct access to consumers is encouraged—whether or not the sector is broken up—purchasing utilities will face increased demand risk as the loss of retail customers becomes a greater possibility.

The key to any debt-based financing is the ability to provide adequate security through a contract or other credible evidence of future revenue streams. Innovative sharing of demand risk between market players—the power seller, the power purchaser, and the financier—will become necessary. An IPP developer's ability to bear any of the demand risk will depend in part on its willingness to provide corporate assets and revenues as a backstop for lenders.

The view that well-capitalized corporate entities will be the ones able to meet financial markets' requirements in a competitive environment seems to be confirmed by market responses. Most recent additions to generation capacity in the United Kingdom—the model of sector unbundling—have been corporate-financed IPPs. And witness the efforts by industry players in the United States to create highly capitalized enterprises as competition for final consumers looms on the horizon. The

recently announced US\$1.26 billion merger of Public Service Co. of Colorado and Southwestern Public Service Co. is a reaction to the perceived increase in demand risk stemming from plans for wider retail competition—the utilities are noncontiguous and plan to build a connecting transmission line to share generating resources.

Conclusion

Greater corporate finance support will make it possible to raise private capital for independent power financing from wider, deeper, and cheaper sources. But innovative strategies will be required from governments, lenders, investors, and power sector enterprises alike. The following strategies are worth considering:

- Encourage the formation of large, well-capitalized independent generation companies. Purely private and quasi-private variants of the Huaneng merchant generation model in China might be workable in large power systems. Healthy competition should be engendered through prudent regulatory reviews of the market power of the IPP in a particular system.
- Encourage divestiture of commercially operating (and perhaps underperforming) generation plants by incumbent utilities to IPP developers. These sales should be conditional on the purchaser's commitment to making specified investments. By making positive revenue streams available to IPP developers immediately, such transactions would give them the financial base to invest in multiple plants.
- In IPP prequalification under competitive bidding, give greater weighting to IPP developers with businesses listed on a stock exchange and to those with well-capitalized balance sheets. The strategic goals of publicly held entities are likely to be more transparent and longer term because of these entities' obligations to public shareholders.
- Encourage project sponsors to use balance sheet support for subordinated debt and quasi-equity portions of the project financing plan in order to increase corporate financing. This

strategy would ease the overall financing costs of projects and could be a transitional strategy for meeting the huge financing needs for IPPs in developing countries.

¹ See Anthony A. Churchill, "Beyond Project Finance," *Electricity Journal* 8(5): 36–44, 1995.

² For the only systematic presentation of information on this issue, see Edward Kahn, Steven Stoft, and Timothy Belden, "Impact of Power Purchased from Non-Utilities on the Utility Cost of Capital," *Utilities Policy* 5(1): 3–11, 1995.

³ The proclaimed success of this transaction is controversial, as the share price of Huaneng dropped from US\$14.25 at listing (October 1994) to about US\$9 in mid-1995.

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Post-Privatization Performance—Regulating Telecommunications in the U.K.

Testing for regulatory capture

Antony W. Dnes

After privatizing British Telecom (BT) in 1984, the British government privatized all other major utility industries in succession—gas in 1986, water in 1989, and electricity in 1990. Debates soon emerged about whether the benefits from privatization in these industries have been equitably distributed between shareholders and consumers. This Note discusses the post-privatization performance of BT, the longest-standing privatized utility in the United Kingdom, to shed light on some of the problems of regulating privatized utilities. A recent event study of BT suggests that regulation has checked monopoly power and that the impact of the regulator's decisions has been heterogeneous—with some decisions favoring consumers, some favoring BT, and some favoring BT's competitors. This event analysis could usefully be extended to the other utilities, which were privatized on different terms and are subject to different regulatory packages.

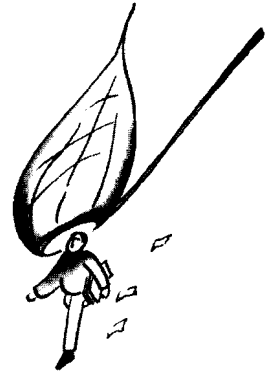
The problem of utility privatization

Nationalized utilities invariably operate with little or no competition, as many are natural monopolies or perhaps natural oligopolies. Competition, where it is possible, cannot emerge until a private market has been created. A privatizing government therefore is immediately subject to the criticism that it is creating private monopolies—especially when newly privatized utilities have to rebalance their charges—raising some and lowering others—to remove the inherited cross-subsidies that are a major financial liability.¹

With these hurdles in mind, the U.K. government decided early in the privatization process to subject newly privatized utilities to a

regulatory regime with two main elements. The regime was designed to substitute for competition by encouraging the regulated firm to operate efficiently, and to promote competition whenever possible. The regulatory agencies adopted price capping (rather than rate-of-return regulation) to limit the exercise of monopoly power and simultaneously sought to stimulate entry.² This regime was based in part on the U.K. government's view by the 1980s that technical advances (fiber optics, for example) had weakened traditional arguments for limiting entry in industries once thought to be natural monopolies. Even in utility industries still thought to be natural monopolies (for example, gas distribution) because of the cost advantages of having just one firm operate, the government came to believe that the cost control discipline exerted by competition would produce net benefits. Therefore, a key feature of post-privatization regulation has been the regulatory agencies' assumption of antitrust responsibilities. The Office of Telecommunications Regulation (OfTel), the Office of Electricity Regulation (Offer), the Office of Gas Regulation (Ofgas), and the Office of Water Regulation (Ofwat) all have responsibility for encouraging competition in their industry.³

There is at least some evidence that post-privatization regulation has checked monopoly power. A series of decisions to open utility markets to competition gave the regulatory bodies a distinctly pro-competitive look. A notable early example of this pro-competitive stance was the October 1985 decision to grant BT's only serious competitor, Mercury Communications (a wholly owned subsidiary of Cable and Wireless), the right to interconnect with BT's local networks at advantageous access prices.



Comparable rulings from Ofgas have allowed entrants to compete in the supply of domestic and industrial gas. The impact of post-privatization regulation has not been uniform, however. For example, BT benefited from the duopoly policy that limited its potential competitors to Mercury until 1990. And Oftel's plans to open the U.K. telecoms market (in practice, to U.S. cable operators) were not as tough as BT had feared.

A recent detailed study of the post-privatization period assessed the overall effect of regulatory events in U.K. telecoms.⁴ This study is outlined below.

Regulatory capture and the public interest

Theories of regulation may be broken down into public interest and private interest approaches.⁵ There is also a mixed view,⁶ which argues that regulation should be seen in public finance terms as benefiting some groups at the expense of others. Among the private interest approaches is the capture hypothesis, associated with the work of the late George Stigler.⁷ This hypothesis is now generally understood as arguing that it is in the private interest of a vote-maximizing government to allow regulatory programs to reflect the interests of powerful electoral groups. A particular concern is that firms in a regulated industry will influence the regulatory environment in their favor—or capture the regulatory process. This capture may occur in the legislature (top-level capture), as policy is formulated and legislation passed, or in the regulatory agency and the ministerial decisionmaking (lower-level capture), as regulatory decisions are made after the regulation is in place.

The private interest view is often contrasted with the public interest approach that emerges from traditional welfare economics. The public interest view sees government as an impartial referee working to maximize the value of total output. This view tends to be regarded as naive by economists working on regulatory top-

ics, who often expect to find evidence of capture or of regulation working as a tax and subsidy arrangement.

Testing for capture

One way to test whether a regulatory package has been captured is to compare the stock market returns for a regulated company or group of companies over a long period with the returns for a comparable sample of firms not affected by the regulation. Abnormally high returns could indicate capture by the regulated industry if they can be associated statistically with changes in the regulatory environment (regulatory events). Lower-level capture would be reflected in an association between returns and individual regulatory events. A cumulative effect from all the regulatory events is consistent with top-level capture (bear in mind that some events will have a positive effect, and some negative). Standard statistical techniques exist for testing for association between regulatory events and abnormal returns while controlling for the effect of other possible influences.⁸

Data

Event data for BT are available from the archives of the *Financial Times* or *Wall Street Journal* for the period 1984–94. A basic event diary includes both regulatory and nonregulatory events. An important nonregulatory event that affected all quoted companies was the perturbation in stock markets in October 1987. Data on the daily share prices for a company are most conveniently drawn from a commercial service such as Datastream. An event study also needs an index of normal market returns for comparison, which in the United Kingdom is usually based on a market index such as the Financial Times Stock Exchange Index of 100 leading firms (FTSE-100).⁹ The technique, which may involve measuring thousands of changes in share prices for each company, has heavy data requirements.

The use of a market index based on the FTSE-100 (but excluding utility companies) implies

that BT is in a risk class similar to that of blue-chip companies. That is in fact a reasonable assumption if utilities' lower risk is linked to their monopoly status and, ultimately, to regulatory tolerance of their situation. In explaining utilities' low risk, their monopoly status should be emphasized rather than the fact that they supply necessities: after all, food retailers also supply necessities, but their returns in the United Kingdom have been anything but stable since they entered into a competitive price war a few years ago. The use of the FTSE-100 allows isolation of abnormally high returns (or, indeed, any reduction in the variance of returns) for utilities attributable to their monopoly status.

Results

In the event study of BT's post-privatization performance, the company's average daily returns turned out not to be significantly higher than the market index, ruling out top-level capture. The results do not, of course, rule out the possibility that BT had attempted such capture, wasting resources in the process.

Regulation may go through a life cycle, however, and can become lower-level captured "in action" over time. Individual events or groups of events may favor industry interests, creating short-term abnormal returns, even if abnormal returns do not show up for the full period under examination. The event study for BT therefore also examined the effects of particular regulatory events by isolating the impact of ministerial and Oftel decisions during 1984–94. The event study showed few statistically significant regulatory events affecting BT over the post-privatization period: of seventy-five identifiable regulatory events, only twelve were significant.¹⁰ Furthermore, within this group of significant regulatory events, some were more robustly significant than others (as measured by standard statistical tests).

Reassuringly, Oftel's interconnection ruling in October 1985, which set low interconnection charges for Mercury, showed up as a robust negative effect on BT's returns. Another signifi-

cant result that accords with expectations relates to the ending of the duopoly policy in 1990. Although it was always known that this policy would end, press reports that its end was imminent in the period just before publication by the U.K. government of a consultative paper, "Competition and Choice," produced a significant negative effect. The publication of the paper in 1990 produced a robustly significant positive effect on BT's returns that can be interpreted as reflecting the removal of uncertainty. Similar relief among investors may explain the robust positive effects on BT's returns stemming from Oftel's decision at the end of 1988 to resolve a lingering dispute over the nonprice terms for interconnecting Mercury. Investors also appear to have been reassured by the outcome of the August 1992 negotiations between BT and Oftel, which led to a decision not to refer BT to the Monopolies and Mergers Commission (MMC), the entity responsible for applying many aspects of U.K. antitrust law—even though the decision was also associated with proposals to tighten the price cap.

The decisions to liberalize private networks and to license new mobile services (including Mercury) in mid-1989 and the publication of another consultative document taking a tough line on price controls in 1992 all appear to have had a negative impact on BT's returns. These events can all be reasonably regarded as regulatory moves that oppose BT's commercial interests. Another event that could be added to this list is the February 1988 decision to relax the rules on entry into satellite services, which favored competition from U.S. sources and had a negative effect. But it occurred too close to an event that followed to allow reliable inferences to be drawn.

At least two pro-competitive decisions appear to have had a significant positive effect on BT's returns. These are the decisions to suspend the monopoly on installation approval (January 1987) and to open the market to more competition (October 1993). Another potentially positive event is the 1988 decision to open competition in specific services, although this

event also is too close to another to allow reliable inferences to be drawn. At first sight, these positive effects are counterintuitive. But investors may believe that creating a generally competitive environment forces BT to become cost-efficient and ultimately improves its profitability.

The event study of BT also revealed some “dogs that failed to bark.”¹¹ Threats by Oftel to examine BT’s prices or to refer BT to the MMC over pricing issues appear to have had no impact on BT’s returns. These threats usually resulted in negotiated settlements, which sometimes had significant positive effects on BT’s returns. This outcome is consistent with the view that BT has earned normal market returns and with financial market expectations that BT will face such scrutiny. Announced revisions of the price cap had no significant impact on BT’s returns, probably because financial markets fully anticipate changes that hold BT to a normal market return. Although not strictly regulatory events, the commencement of share trading following the BT1, BT2, and BT3 share offers between 1984 and 1993 had no significant impact on returns.

Conclusions

BT seems to have earned normal market returns for the most part and thus does not appear to have captured the regulatory process. There were no individual events suggesting the early capitalization into share prices of anticipated future abnormal returns. And a detailed review of regulatory events revealed no clear pattern favoring or opposing BT’s commercial interests. Moreover, since BT has not been pushed below a normal market return, there is no evidence of capture by consumer interests. Instead, the regulatory pattern of events is heterogeneous, with some events favoring BT, some favoring its competitor, Mercury, and some favoring consumers.

The event study of British Telecom therefore suggests that Oftel has carried out its regulatory function effectively and avoided capture.

Although precise statistical tests need to be carried out for gas, water, and electricity,¹² press reports suggest that a heterogeneous pattern of regulatory effects also characterizes these utility industries. Thus, the post-privatization performance of utilities in the United Kingdom shows how decentralized regulation, based on price capping and promotion of competition, can prevent privatized utilities from becoming private monopolies.

Illustration by Ruth Sofair Ketter.

¹ Cross-subsidy cannot be justified by social-welfare economic analysis either. See D. Swann, *The Retreat of the State* (Harvester Wheatsheaf, 1989).

² M.E. Beesley and S.C. Littlechild, “The Regulation of Privatized Monopolies in the UK,” *RAND Journal of Economics* 20: 454–72, 1989.

³ See John Moore, “The Success of Privatization,” in John Kay, Colin Mayer, and David Thompson, eds., *Privatization and Regulation—The UK Experience* (Oxford: Oxford University Press, 1986). John Moore was financial secretary to the Treasury in the early Thatcher government.

⁴ A.W. Dnes and J.S. Seaton, “The Regulation of British Telecom: An Event Study,” Discussion Paper, The Nottingham Trent University, Department of Economics, Nottingham, March 1995.

⁵ See T. Weyman-Jones, “Deregulation,” in P.M. Jackson and C.M. Price, eds., *Privatization and Regulation* (New York: Longman, 1994).

⁶ See R. Posner, “Taxation by Regulation,” *Bell Journal of Economics* 5: 22–51, 1974.

⁷ G. Stigler, “The Theory of Economic Regulation,” *Bell Journal of Economics and Management Science* 2: 137–46, 1971.

⁸ See Dnes and Seaton, “The Regulation of British Telecom.”

⁹ The analyst must exclude the companies in the event sample from the market index.

¹⁰ *Significance* refers to statistical significance (that is, the association could not have been generated by chance). Similarly, *robustly significant* means that the significance is maintained throughout different formulations of the economic model used in the event study.

¹¹ “Is there any other point to which you would wish to draw my attention?”

“To the curious incident of the dog in the night-time.”

“The dog did nothing in the night-time.”

“That was the curious incident,” remarked Sherlock Holmes. (*Silver Blaze*, from the *Memoirs of Sherlock Holmes*, by Sir Arthur Conan Doyle, 1892)

¹² Work is being carried out by economists at the University of Oxford on a recent tightening of the electricity price cap. And economists, including the author, based at the Nottingham Trent University and Loughborough University of Technology are carrying out studies of the post-privatization performance of all the privatized utilities.

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Subscribing to Monopoly

The telecom monopolist's lexicon revisited

Peter Smith

The advocates of monopoly provision of telecommunications services have consistently relied on a small lexicon of catchphrases to support their case—*wasteful duplication of facilities*, *uneconomic entry*, *universal service*, *cream skimming*. These phrases convey a simplistic and often fallacious rationale for monopoly that is deeply entrenched in the thinking of telecommunications executives, civil servants, and investment bankers around the world. Although the monopoly approach has had some successes, it has also resulted in chronically poor telecommunications services in many developing countries. This Note assesses each catchphrase and its underlying arguments.

Wasteful duplication of facilities

Wasteful duplication evokes an image of multiple cables—owned by different telephone companies—stretching between buildings and across the countryside. The underlying economic argument is that the telecommunications sector is characterized by economies of scale and scope—that it is a natural monopoly. In this view, one supplier can produce a range of telecommunications services at lower cost than multiple suppliers. Consequently, it is argued, to avoid wasteful duplication of network facilities, telephone companies should continue to have a legal monopoly.

This argument is a dubious one. First, it assumes that losses of economic efficiency resulting from potential losses of scale and scope are likely to be the most important consideration. But there is now plenty of evidence that this is not the case. In the vast majority of developing countries that have suffered from

chronic and often acute undersupply of telecommunications service in a monopoly regime, the largest economic loss has not been loss of economies of scale and scope, but a massive failure to meet economic demand for service.

Second, there are many examples of other very large economic losses resulting from the productive inefficiencies that arise in the absence of competition. In many developing countries, capital costs range from US\$3,500 to US\$4,000 per telephone line, compared with achievable costs of about US\$1,000 to US\$1,500. High levels of productive inefficiency are also confirmed by the responses of industrial country telephone companies exposed to competition. For example, BT (formerly British Telecom) is in the process of reducing the number of its employees from about 240,000 in 1984 to about 140,000 by the end of 1995. Similarly, in the United States, competition and divestiture are widely recognized as having caused AT&T to make substantial efficiency improvements.

Third, the “wasteful duplication” argument in support of legal monopoly assumes that economies of scale and scope can be “harvested” only by a single supplier. That is clearly not the case—network interconnection is a well-established mechanism for reaping economies of scale and scope in a multi-operator environment.

Fourth, the natural monopoly argument implicitly assumes that the economies of scope exist only within the telecommunications sector (for example, in the provision of both local and long-distance service by a single supplier). Not only have these economies of scope been difficult to verify in econometric studies,¹ but the

assumption ignores the potential for supply convergence—the probably much larger economies of scope available to companies that also provide other network services, for example, cable television or electricity distribution. In the United Kingdom, local telephone service is provided not only by BT and Mercury but also by cable television companies and by Energis, a new entrant that uses electricity distribution ducts and rights of way for local telephone network facilities.

Uneconomic entry

The “uneconomic entry” argument is an offshoot of the “wasteful duplication” one. It contends that when telecommunications prices are very distorted—as they often are, by high prices

The largest economic loss has not been loss of economies of scale and scope, but a massive failure to meet economic demand for service.

(relative to costs) for long-distance telephone service and by rate averaging—new entrants could achieve profitability while at the same time increasing the sector’s total costs of meeting demand for service. In other words, price distortions could enable a new entrant to make a profit at lower prices than an incumbent despite higher unit costs. On this basis, it is argued that new entry should be prohibited until prices are rebalanced to reflect costs.

Although the potential for uneconomic entry is real, the assumption that the appropriate policy response should be to prohibit entry until prices are rebalanced is wrong. This approach, again apparently based on a public interest in minimizing total system costs, would have the effect of postponing new entry indefinitely where politicians find rebalancing rates difficult. In fact, often the fastest way to rebalance rates is not to postpone new entry but to au-

thorize it in highly profitable market segments. “Taking the cream away” greatly increases incentives for incumbent operators to rebalance rates to reflect costs as well as to reduce their costs in order to remain competitive.

Universal service

A widely accepted public policy objective in the telecommunications sector is universal telephone service—often defined as a telephone line (or a shared telephone line) for every household. Depending on prices, household income, and consumption preferences, however, many households would choose not to subscribe to telephone service, particularly in developing countries. So it is argued that the objective of universal service requires massive cross-subsidy managed within a monopoly regime—and therefore a pricing structure that bears no relation to costs. Monopoly, it is argued, is necessary to generate the profits to be used to cross-subsidize service to “uneconomic” market segments or regions. Cross-subsidies normally run from international and national long-distance service to local service, from urban to rural subscribers, and from business to residential service. Ironically, this argument for universal service has often been used to justify the worst of all possible economic outcomes in the sector—a monopoly on a service that is not provided at all (in the rural areas of many developing countries) or not provided to any adequate standard (in both urban and rural areas of many developing countries).

Although achieving universal service has been the rationalization for maintaining a legal monopoly, there are fundamental problems with this objective. First, universal service, if it means a telephone for every household, is not necessarily the right goal for every country; where per capita income is low and capital scarce, there are likely to be higher priorities. Second, the idea that low, subsidized local telephone access prices are the best route to universal service is wrong. In most developing countries suffering from chronic unmet demand for tele-

phone service, the key problem is inadequate supply (inadequate investment and inefficient investment and operations), not inadequate demand. Furthermore, the lower costs and increased innovation in service provision that result from a competitive market are likely in the long run to be at least as important as subsidies in improving the affordability of telephone service. In addition, there is evidence from some countries that household subscribers who lose telephone service when they cannot afford to pay for it do so because of the high-priced long-distance service component of their bill.² Third, assumptions about the uneconomic characteristics of some market segments may be wrong. What is uneconomic for one operator can be profitable for others and therefore may not need to be cross-subsidized at all.

Cross-subsidies raise some complex issues. The argument for them assumes that the scale of cross-subsidy required is very large. But a study in Australia found the required subsidy to be quite small.³ The argument also assumes, incorrectly, that monopoly is required for cross-subsidy to be possible. That is clearly wrong—there are many examples of cross-subsidies coexisting with competitive markets for telecommunications services. Also wrong is the assumption that subsidies must be cross-subsidies, between large groups of customers within the telecommunications sector, and effectively administered by the monopolist. If subsidies are required to achieve political goals, direct, targeted ones may be more appropriate. An important concern is that both cross-subsidies and monopoly reduce incentives for efficiency. Indeed, it is very difficult for a regulatory agency to tell whether it is customers who are being cross-subsidized—or employees, investors, equipment manufacturers, and inefficiency. Finally, in developing countries, the typical case of cross-subsidy of urban residential telephone service is the equivalent of a regressive tax and income redistribution policy. This de facto tax and transfer scheme, established without legislative approval, benefits primarily the urban middle class.

Cream skimming

“Cream skimming,” together with its cousin “cherry picking,” is the argument that new entrants in telecommunications are likely to focus on the most profitable parts of the market—typically international and national long-distance and local business telephone service—or on the largest customers in these market segments. As a result, it is argued that a cross-subsidy scheme would not be sustainable in the face of “cream skimming” new entrants and that politicians would not be comfortable with the resultant rate



The argument for universal service has been used to justify the worst of all possible economic outcomes in the sector—a monopoly on a service that is not provided at all or not provided to any adequate standard.

rebalancing, involving possibly unpopular increases in local network access subscription charges. The discussion of this issue is then essentially the same as the cross-subsidy discussion above. The cherry picking argument assumes that in a competitive telecommunications services market, corporate customers are the most profitable. This is not always the case. In the United Kingdom and the United States, for example, this market segment has one of the lowest profit margins, and there is also vigorous competition from both incumbent operators and new entrants for residential customers. Cream skimming should be viewed not as a negative and unwholesome activity, but as normal market behavior that, by “taking the cream away,” helps correct price distortions and enhances incentives for cost reductions.

For the criticisms of cream skimming to be valid, three assertions would have to be true: that the “cream” is necessary to promote ex-

panded demand for service; that it is used effectively by the monopolist to expand service and not dissipated in inefficient operations, overstaffing, unnecessarily high payments for equipment, and transfers to shareholders; and that the monopolist's cost structure is so close to optimal that competition would bring minimal efficiency gains. In practice, in many, many cases, these assertions are not true.

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Obstacle to liberalization

Each catchphrase—*wasteful duplication of facilities, uneconomic entry, universal service, and cream skimming*—packages complex issues with a superficial and flawed appeal to a public interest agenda. Very often the objective is to bolster the case for continuing a monopoly and maintaining the role of the monopolist as the vehicle for cross-subsidy. The risk that this approach will create the wrong incentives for investment and efficiency and sustain poor performance is very high. The monopolist “mind set” has slowed liberalization in many developing countries, and the resulting absence of competition has led to persistently poor telecommunications services.

¹ See Coopers & Lybrand Consulting Group (1988).

² See Canadian Minister of Supply and Services (1986).

³ See AUSTEL (1994).

References

- AUSTEL. 1994. *Telecommunications Universal Service Obligation*. Australian Telecommunications Authority Occasional Paper.
- Baer, Walter S. 1995. “Telecommunications Infrastructure Competition—The Costs of Delay.” *Telecommunications Policy* (July).
- Canadian Minister of Supply and Services. 1986. *Federal-Provincial Examination of Telecommunications Pricing and the Universal Availability of Affordable Telephone Service*. Report and Working Papers. Ottawa.
- Coopers & Lybrand Consulting Group. 1988. “The Effect of Changing Technology on the Structure of Costs for the Provision of Public Long-Distance Telephone Service.” In Federal-Provincial-Territorial Task Force on Telecommunications. *Competition in Public Long-Distance Telephone Service in Canada*. Ottawa, Canada: Minister of Supply and Services.
- Mueller, Milton. 1993. “Universal Service in Telephone History: A Reconstruction.” *Telecommunications Policy* (July).
- Smith, Peter, and Gregory Staple. 1994. *Telecommunications Sector Reform in Asia: Toward a New Pragmatism*. World Bank Discussion Paper 232. Washington, D.C.

Concessions—The Way to Privatize Infrastructure Sector Monopolies

Pierre Guislain and Michel Kerf

Concession-type arrangements are well suited for privatizing sectors with monopolistic characteristics.¹ Under this approach, the state (or municipality or other public entity) delegates to the private sector the right to provide a service, yet retains some control over the sector by incorporating in a concession contract or license the terms and conditions—including the rights and obligations of the service provider—that will govern the infrastructure project or company. This Note outlines the concession-type approach and some of its operational implications.

Options for private sector provision

There is a continuum of options for involving the private sector in the provision of infrastructure services, as illustrated by the figure on the right.² At the base (in white) are supply and service contracts, which tend to be of short duration and require less private commitment than the options higher in the continuum. The private contractor is not directly responsible for providing the service, but instead for performing specified tasks, such as supplying inputs, constructing works, maintaining facilities, or billing customers. In this first category, private sector involvement is highest in management contracts. When these include mechanisms linking the contractor's compensation to the performance of the utility it manages, they come closer to the concession-type arrangements (in pink and purple in the figure) that are the focus of this Note.

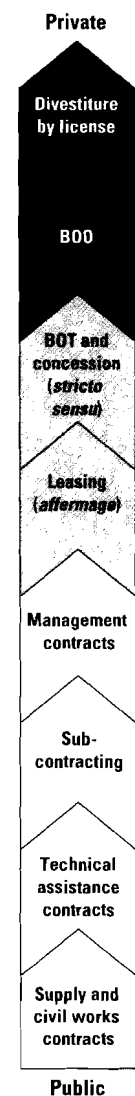
The first of these arrangements is the lease-and-operate (or *affermage*) contract, under which the private contractor is responsible at its own risk for provision of the service, in-

cluding operating and maintaining the infrastructure, typically against payment of a lease fee. In the second, concession *stricto sensu*, the private contractor is also responsible for building and financing new investments. At the end of the concession term, the sector assets are returned to the state (or municipality). The term BOT (build-operate-transfer) is often used to refer to greenfield concessions, and ROT is sometimes used to describe concessions in which investments entail primarily rehabilitation (hence the “R”) rather than construction.

BOO (build-operate-own) is a similar scheme, but does not involve transfer of the assets. Divestiture, finally, involves the transfer to the private sector of the ownership of existing assets and the responsibility for future expansion and upkeep. In both cases, the private company is responsible for financing and carrying out the investments required to meet the obligations specified in its license or by the regulator.

In all these concession-type arrangements (hereafter, concessions), a public entity, typically the state or a municipality, grants the right and the obligation to provide an infrastructure service to a private company (the concessionaire).³ The service, whether gas, power, water, transport, sanitation, or telecommunications, is provided under terms and conditions specified in a contract or license. The private sector takes over operational responsibility and at least part of the commercial risk of service provision. The concessionaire is by and large held responsible for achieving specified results in service delivery and is given some freedom to choose the means for meeting those targets.

RANGE OF PRIVATE SECTOR OPTIONS



Sizing up concessions

Despite these common features, important differences do exist between the different types of concessions. These variations can have important operational implications.

Responsibility for new investments

Although the responsibility of the private sector under a concession always includes the operation and maintenance of the system or facilities and the supply of the infrastructure service, it may or may not include the design, construction, and financing of the new infrastructure.

Legal ownership

The legal status of assets built and financed by the private operator may also vary. Under the traditional French concessions, for example, the state owns these assets from the moment they are built, but the private operator retains full control over them until the end of the concession period. In other cases, including many BOT or ROT schemes and even some French concessions, the legal ownership of assets built and financed by the private operator will remain private until their transfer to the state at the end of the concession term. Finally, under BOO contracts and divestiture schemes, these assets remain private. Private ownership may give investors more protection and facilitate the financing of concessions by making these assets available as collateral.

Duration

Leases, BOTs, and concessions *stricto sensu* (in pink in the figure) are generally granted for fixed periods. At the end of the specified term, most assets (including those financed by the concessionaire), as well as the right to carry out the activity, return to the public entity. In France and other countries with a long tradition of using concessions, however, these contracts are often renewed or retendered.

The contracts' duration tends to reflect the number of years investors need to recoup their investment. That is the case for French-style concessions, under which assets return to the state at the end of the period free of charge or for a nominal amount. Lease-and-operate contracts (*affermages*), under which the public authority remains responsible for financing most investments, are shorter (ten to fifteen years) than greenfield BOTs or concessions *stricto sensu* requiring major up-front capital expenditures; these can exceed thirty years. Similarly, the transfer of existing sector assets (for example, a distribution network or a parallel bridge) free of charge at the time of the award not only reduces the relative size of new investments. It also provides a free cash flow for financing these investments, allowing a shorter payback period and a shorter contract period.

Matching the contract term to the amortization of investments is not essential, however. The government generally reserves the right to terminate the contract before the end of its normal term. In addition, infrastructure services require continuous investment that cannot be adequately predicted decades in advance. Investments will almost always have to be made toward the end of the concession that cannot reasonably be amortized before its expiration. Moreover, the true value of the business is in no way limited to the value of the unamortized assets built by the incumbent. It also includes intangible assets, know-how, reputation, and billing and collection systems.

Schemes should thus be designed with proper incentives for maintenance of the facilities and for valuation of assets that have not been fully amortized. For example, a payment might be made by the public authority to the private operator on the basis of an evaluation by independent experts. Another option would be to stipulate that the concessions awarded will be rebid periodically—as the Argentines have done in the power distribution sector. Though the Argentine concessions are for a period of ninety-five years, they are rebid after the first

fifteen years and every ten years thereafter. If the incumbent bids the highest price, it retains the concession. If it doesn't, the highest bidder pays the amount of its bid to the incumbent, not to the public authority. In this way, assets that are not fully amortized are valued by the market, not at the discretion of the state or a regulator.

In monopolistic sectors, even BOOs and full divestiture do not imply permanence. The private company does have indefinite ownership rights to the assets. To be allowed to provide the service, however, it typically also needs an operating license, which the government can withdraw, revoke, or not renew. In England and Wales, for example, the privatized water utilities have a license in perpetuity, but the government can terminate these licenses after twenty-five years with ten years' notice. In addition, licenses can be revoked at any time for noncompliance. The difference between a traditional fixed term concession (in pink in the figure) and an indefinite divestiture thus may not be as big as it might at first appear.

Bulk or retail supply

In its classical (or narrow) sense, a concession is a public utility: it provides a public service to end users. Direct payment of the concessionaire by the users, who are not party to the concession contract, was seen as a defining feature of this scheme. Examples of such concessions include bridges, tunnels, toll roads, and water and power distribution systems.

In the broader sense suggested by this Note, concession-type arrangements also include schemes under which an independent producer of, say, power or bulk water sells its product to a single buyer, the public utility. Examples include the fifty-year bulk water supply BOT in Casablanca signed in 1949 and the many private power deals signed in recent years in such countries as China, Indonesia, Pakistan, and the Philippines. The risks associated with a public utility and a bulk supply concession differ significantly.⁴

Regulatory implications

Concession arrangements embody a regulatory framework and should be seen as an integral part of economic regulation, rather than as a substitute or alternative. The key elements of the regulatory framework, including tariffs, degree of competition, interconnection regime, and performance targets, are defined in the concession contract or operating license. Because of the element of monopoly, public service obligations tend to include detailed specifications on the service to be provided, the obligation to supply, equal treatment of users, continuity of service, and so on. In consideration of these obligations, concessions often grant certain exclusive rights to the private operator.

These terms need to be monitored and enforced and may need to be revised from time to time to reflect changing conditions. Thus, concessions (or the legal framework that governs them) may grant the public authority or a regulator a certain amount of discretion and, at the same time, provide recourse against the decisions of the authority or regulator. In view of concessions' public service nature, public authorities will often reserve the right to unilaterally modify some of the provider's obligations or even to terminate a concession before its stipulated term.⁵

Whatever the approach, all concessions include some form of regulatory mechanism. Under the French model, the concessionaire is regulated in part by the public authority that awarded the concession and to a lesser extent by that authority's supervising agencies. The authority and agencies themselves are kept in check by the political process (including elections) and the courts. Concessions also may be regulated by independent regulatory bodies, as in Argentina. The selection mechanism can play an important regulatory role by awarding the concession initially on a competitive basis and by putting it up for bid periodically thereafter. Indeed, repeatedly auctioning off the concession right allows monopoly rents to be extracted without discretionary intervention by the regulator or government.⁶ Self-regulation also may

play an important role: most concessionaires are concerned with protecting their reputation (or their shareholder's) in the market.

A customized instrument

The concession is a flexible mechanism that can be designed to overcome a broad range of obstacles to private participation in infrastructure. The option of leaving formal ownership of existing sector assets to the state makes it particularly useful in countries in which the law or constitution excludes private ownership of specific infrastructure assets. For the same reason, recourse to a concession is an elegant solution when the sale of the infrastructure company or assets would not fetch the “right price” and would expose the government to accusations of a giveaway. Public ownership may also provide tax advantages where tax laws treat public ownership more favorably—for example, by allowing a concessionaire to depreciate investments faster than if it owned them.

Because concession-type agreements can be made as specific as required, they are well suited to situations in which more general and vaguely defined regulatory approaches would deter investors. And they can be tailored to allocate risks in a variety of ways to give investors the comfort they need to venture their capital in specific countries and markets.

The flexibility of this mechanism is clearly one of its main strengths, but it can also be perplexing. Designing a scheme that strikes the right balance between the interests of the investors, the consumers, and the public authorities and that fits the conditions of the sector and the country concerned is pivotal. It requires a clear identification of the objectives and of the tradeoffs that must be taken into account to achieve them. Blueprints and model contracts can rarely be transposed from one country and sector to another. With time, countries will develop their own precedents, and the process will become easier. But each concession is likely to remain a special case requiring special attention and unique features.

In sum, what matters most are the incentives built into a specific scheme, not whether it is labeled as a concession, a BOT, a privatization, or by any other name.

¹ The concession technique is less suited to situations in which competition can and should be introduced *in* the market—distinct from competition *for* the market through competitive bidding for the exclusive right to provide a service. Where multiple firms must compete with one another for the provision of services, competitive discipline tends to reduce the need for economic regulation. Such firms should operate on a level playing field under a uniform regulatory framework (such as antitrust legislation), not under the terms of individual regulatory deals that would discriminate among players. And, under normal circumstances, the state would no longer have the option to terminate the operator's right to provide the service.

² With any of these schemes, private participation would be less where the state or other public entities are shareholders of the service provider.

³ Concessions have also been granted to autonomous public entities, for example, ADM, the Moroccan toll road company. In France, state-owned companies are concessionaires of toll roads and hold monopoly concessions in the gas, power, and railroad sectors. In other cases, the state is a minority shareholder of the concession company (for example, SEEG, the Conakry, Guinea, water company).

⁴ Collecting from hundreds of thousands of households, enterprises, and administrations may be more difficult, but in addition to strong incentives to collect, the concessionaire possesses the tools required to make users pay (including the right to cut off service in case of arrears). Exposure to a single buyer, by contrast, may require more government guarantees or comfort, especially when the buyer is a state enterprise that may be uncreditworthy and protected from the concessionaire's power to cut off service. In a public utility concession, the private operator bears the market risk directly, such as the risk of a drop in demand. With a single buyer, this risk is usually taken by the public utility through take-or-pay arrangements, although where the utility may limit its take to a contractual minimum that is lower than capacity, the private operator would still face a residual demand risk.

⁵ Some form of compensation is usually called for when modifications create more onerous operating conditions or in case of early termination.

⁶ See also the section above on duration of concessions and Anthony Dnes, “Franchising and Privatization,” *Private Sector* (March 1995). The competitive award of a concession is a form of franchising, as this term is used in the economics literature.

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The World Bank Contribution to Private Participation in Infrastructure

Omer Karasapan

The wave of private sector participation in infrastructure (PPI) now sweeping the globe started in Chile, New Zealand, and the United Kingdom in the early 1980s. More than 900 PPI projects got under way between 1984 and 1994—ranging from telecommunications in Cuba to multisectoral initiatives in countries as disparate as Albania and Colombia—and more than 2,200 are under preparation. The World Bank's lending operations have supported this worldwide PPI movement. In 1988–94, the Bank provided funds for more than 500 infrastructure projects—about a third of all Bank operations in this period. Of these projects, ninety-two contained significant PPI components, including the privatization of public utilities, on-lending to private sector operators,¹ and franchising operations involving leases, concessions, and management contracts. In keeping with the Bank's mandate, its focus in supporting PPI has been on policy-related work and less developed regions—particularly Africa.

World Bank instruments and PPI

The Bank's support to the PPI agenda has utilized traditional lending instruments—adjustment, technical assistance, and investment loans, and on-lending to the private sector. Increasingly, the Bank is also trying new and innovative approaches, such as guarantees and investment funds designed to catalyze private sector investment. These new approaches are being refined in the light of experience. Table 1 summarizes the sectoral spread of the Bank's PPI operations in 1988–94—as well as those of the International Finance Corporation (IFC), another member of the World Bank Group—and table 2 summarizes World Bank operations by instrument and region for the same period.

Adjustment loans

The Bank has developed adjustment loans—loans to support major multisectoral policy improvements—in Argentina, Mexico, and Venezuela and is working on similar arrangements in Bolivia and Peru. All these loans depend on and require a long-term commitment by the government to an infrastructure privatization agenda. They also involve technical assistance and, for Bolivia and Peru, related investment loans. Support to multisectoral PPI agendas has also been provided through stand-alone technical assistance loans to Turkey and Uruguay.

These PPI programs have three main components. They support the design of a stable,

TABLE 1 WORLD BANK AND IFC PPI PROJECTS BY SECTOR, 1988–94

Sector	World Bank	IFC
Multiple	10	3^a
Telecommunications	10	23
Transport	21	11
Water and sanitation	6	2
Power	22	29
Energy	6	6
Solid waste	1	0
Direct poverty alleviation	16	0
Total	92	74

a. Refers to infrastructure leasing operations, all in India.

Source: World Bank, Private Sector Development Department, PPI Group.

TABLE 2 WORLD BANK PPI OPERATIONS, 1988–94

Instrument	Latin America	Africa	Middle East and North Africa	Europe and Central Asia	East Asia and the Pacific	South Asia	Total
Adjustment: single sector	2	1	0	0	0	0	3
Adjustment: multisector	5	0	0	0	0	0	5
Technical assistance	4	2	0	1	1	0	8
Investment lending	14	33	1	6	10	12	76
On-lending to private sector	3	1	0	1	3	5	13
Direct poverty alleviation	3	12	0	0	1	0	16
Public investment facilitating PPI	8	20	1	5	6	7	47
Franchising	2	12	0	0	1	0	15
Funds	0	0	0	0	0	2	2
Total	25	36	1	7	11	12	92

Source: World Bank, PPI Bank Projects Database.

comprehensive, and consistent legal and regulatory basis for PPI, addressing common cross-sectoral and sector-specific issues. They promote local capital market development—to foster the growth of long-term funding sources for PPI projects. And they address the social and political risks associated with the reform agenda by supporting social safety net frameworks and public education campaigns to build support for the reforms.

Investment loans

World Bank investment loans for physical infrastructure can play a catalytic role in the privatization of infrastructure services. These loans are now the most frequently used instrument for PPI operations, accounting for seventy-six of the ninety-two PPI operations. Most of these loans (forty-seven) support establishment of the legal and regulatory basis for PPI and fund public investments that complement and facilitate private participation. Transport sector projects in Albania and Poland, for example, provided funds for road maintenance and investments in new transport and maintenance equipment, paving the way for the privatization of trucking, road maintenance, and repair operations. Similar loans with policy

components have been undertaken in forty-five other countries, including China (telecoms) and India (power).

Franchises—big in Africa

Fifteen investment loans involved franchise arrangements. Under these loans, the Bank helped to design management contracts, leases, or concessions for infrastructure services. Franchise arrangements are most common in Africa, where twelve were supported by Bank infrastructure loans in 1988–94. These included management contracts for airlines (Chad), telecoms (Guinea), and power (Guinea, Mali, Sierra Leone); leases in power (Côte d'Ivoire, Rwanda) and water (Gambia, Guinea); concessions in water (Côte d'Ivoire); and contracting out of rail services (Tanzania) and government contract services (Tanzania).

Direct poverty alleviation

While the operations discussed so far have focused mainly on improving the delivery of infrastructure services through private sector participation, the Bank has also used PPI components in projects designed primarily to reduce poverty. One example is the AGETIPs (Agences

d'Exécution des Travaux d'Intérêt Public) model, first used under the Senegal Public Works and Employment Loan (1989). AGETIPs are independent and privately managed agencies for executing public works. The agencies evaluate small (US\$50,000 to US\$100,000), largely community-initiated civil works and maintenance projects, such as schools, roads, and health centers, and run competitive bids for potential contractors. Because the contracts stipulate labor-intensive methods, only small and medium-size private enterprises are likely to bid. The aim is to promote employment and to contribute to private sector development, in part through technical assistance to private contractors and local consultancy services. To ensure local "ownership," the projects must include a contribution from the locality—usually 5 to 10 percent of the total cost. Besides the initial project in Senegal, such operations have been mounted in Burkina Faso, Chad, Côte d'Ivoire, Gambia, Madagascar, Mali, Mauritania, Niger, and Togo, and follow-up projects have been initiated in Senegal and Togo. Outside Africa, similar operations have been undertaken in Bolivia, Guatemala, the Lao People's Democratic Republic, and Peru.

On-lending

In eleven PPI operations, Bank funds were on-lent to private sector operators of infrastructure services. These operations, most of which involved existing private sector operators, included power projects in India and Turkey, water and telephony projects in Argentina and the Philippines, and transport sector operations in Ethiopia and Mexico.

Two other on-lending operations, in Jamaica and Pakistan, have involved new private operators. Both loans have focused on creating an enabling environment for PPI and mobilizing finance from different sources through a private infrastructure fund. In Jamaica, this fund—the Private Sector Energy Fund—was set up for a private sector power project constructed on a BOT (build-operate-transfer) basis using limited recourse financing. Established

by the Energy Sector Deregulation and Privatization Loan (1992), the fund was administered by the government-owned National Investment Bank of Jamaica. In Pakistan, the Private Sector Energy Loan (1988) set up the Energy Development Fund (EDF) to cover up to 30 percent of the cost of subprojects using BOO (build-own-operate) arrangements. A similar loan finalized in 1994 replenished the EDF.

World Bank guarantees

The first Bank guarantee for a PPI project—and the only one issued to a private sector operator so far—went to the Hub Power Project in Pakistan under the Private Sector Energy Loan (1988). The financing required for this 1,300 megawatt project was US\$1.9 billion, of which 75 percent was to be funded in debt, including US\$680 million in syndicated commercial bank loans. The Bank provided a partial risk guarantee on principal repayments of US\$240 million, and Japan's EXIM Bank guaranteed an additional US\$120 million. The Bank guarantee covers the obligations of government agencies (for public utility payments, fuel supply, and provision of foreign exchange) and force majeure events (legislative changes, political events in Pakistan, and specified natural events).

The Bank also provides partial credit guarantees. In China, Jordan, and the Philippines, guarantees have gone to government entities. In the Jordan Telecommunications Project (1994), a US\$50 million Bank guarantee facility will support a bond issue by the Jordan Telecommunications Corporation (TCC). This foreign currency bond offering will take place in the Eurobond market as well as in Jordan, to allow for broader distribution. The bond offering incorporates an equity feature, giving investors an option to convert the bonds into shares should the TCC be privatized before the bonds mature. And it both promotes the commercialization of TCC by exposing it to debt market discipline and facilitates privatization by paving the way for the debt-equity conversion.

PPI and the World Bank Group

PPI work is also carried out by the other institutions of the World Bank Group—the Multilateral Investment Guarantee Agency (MIGA) and the International Finance Corporation (IFC).

MIGA guarantees

The value of guarantees benefiting infrastructure projects in MIGA's portfolio was more than US\$150 million by May 1995. These guarantees had facilitated more than US\$550 million in foreign investment in infrastructure through twelve contracts, including the first foreign private power projects in Honduras and Jamaica and a toll road in Argentina.

IFC operations

The IFC initiated assistance to PPI projects at roughly the same time as the Bank (table 3) and has kept pace with the global growth in PPI projects. In 1988–94, the IFC was involved in seventy-four PPI projects. The IFC has focused on projects in Asia and Latin America and in the power and telecoms sectors, where the basis for PPI is better established (tables 1 and 4). It has also participated in four funds created to take equity positions in infrastructure projects. IFC participation in the Scudder Latin America Trust for Power was approved in 1993. In 1994, the IFC also participated in the multisectoral Asia Infrastructure Fund, the Global Power Investment Fund, and the Central European Telecoms Fund.

The Note uses the number of operations rather than their value because of the different leverage structures used by the Bank, the IFC, and MIGA and because, with many of the Bank PPI operations components of bigger loans, using the total loan figure would exaggerate the volume of the Bank's PPI work. The data for the IFC in the Note refer to the period 1988 through June 1994.

¹ Funds are recorded as a deposit in the central bank, and the contractual borrower (usually the central bank) agrees that the loan money will be made available to a third party within the country.

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TABLE 3 WORLD BANK AND IFC PPI OPERATIONS, 1988–94

Year	World Bank	IFC
1988	3	2
1989	7	6
1990	11	6
1991	13	6
1992	18	9
1993	17	18
1994	23	27
Total	92	74

Note: The IFC total includes all approved projects except infrastructure funds and projects later canceled.

TABLE 4 IFC PPI PROJECTS BY REGION, 1988–94

Region	Projects
Latin America	40
Asia	23
Europe	7
Sub-Saharan Africa	3
Central Asia, Middle East, and North Africa	1
Total	74

Source: World Bank, Private Sector Development Department, PPI Group; and IFC, *Financing Private Infrastructure Projects* (Washington, D.C., 1994).

The Private Infrastructure Industry— A Global Market of US\$60 Billion a Year

Jae So and Ben Shin

Private infrastructure projects have boomed around the world since the 1980s, in such sectors as waste, power, water, transport, telecommunications, and natural gas. Much of this activity has its origins in the deregulation policies in the United States during the 1970s and in the privatization experiences of Chile, New Zealand, and the United Kingdom during the 1980s. These deregulation and privatization policies were driven by disenchantment with public sector performance, fiscal crises (often related), and technological changes that have increased the scope for competition. Since 1984,

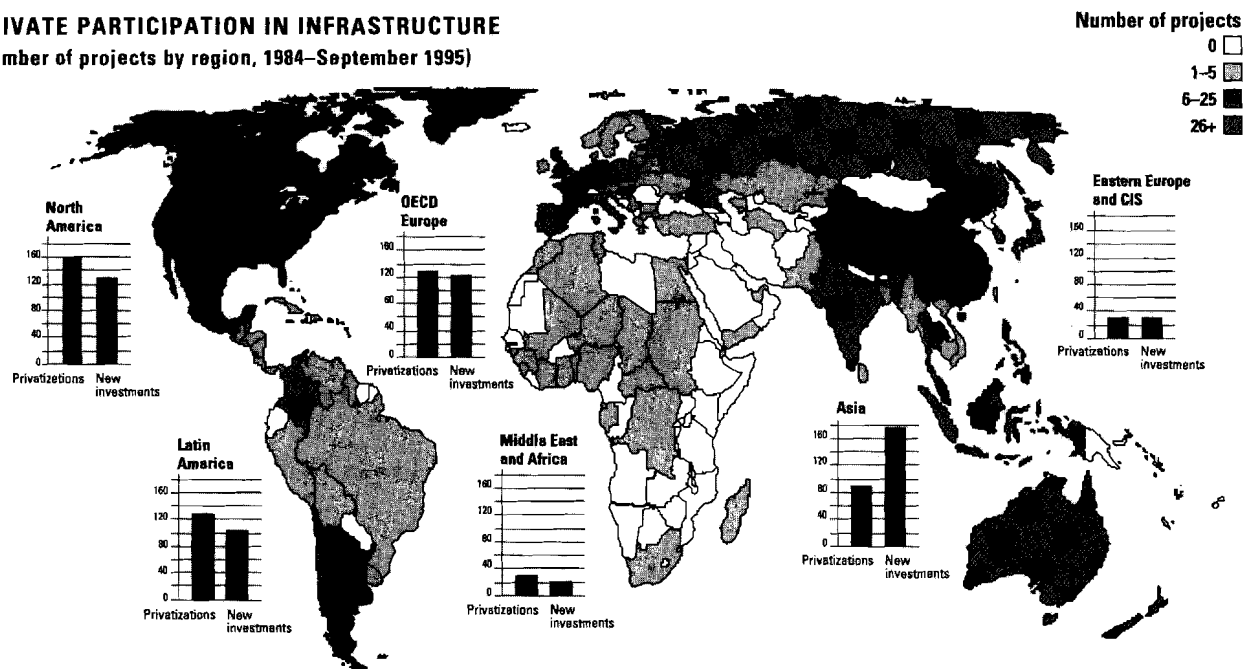
eighty-six countries have privatized 547 infrastructure companies, and at least 574 private greenfield infrastructure projects are under way in some eighty-two countries (see figure 1 for sectoral distribution). This Note sketches the growth of the private infrastructure industry.

A US\$60 billion annual market

Since January 1984, the value of privatizations has totaled US\$357 billion and that of new investment projects more than US\$308 billion. Thus, private investment activity in infra-

The first edition of this Note, issued in June 1995, was based on data collected to December 1994 in the Private Infrastructure Project Database under development in the Private Sector Development Department of the World Bank. This edition reflects data collected through early September 1995. See box on page 39 for information on how the numbers have changed.

PRIVATE PARTICIPATION IN INFRASTRUCTURE
(number of projects by region, 1984–September 1995)



The boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of the World Bank Group, any judgment on the legal status of any territory or any endorsement or acceptance of such boundaries.

Source: World Bank, Private Infrastructure Project Database, September 1995

TABLE 1 TOP TEN NEW PRIVATE INFRASTRUCTURE INVESTMENT PROJECTS, 1984–SEPTEMBER 1995

Location	Project	Contract	Cost (US\$ millions)
France/United Kingdom	Channel Tunnel	BOT, 55 years	19,000
Taiwan (China)	Taipei mass rapid transit system	BOT	17,000
Japan	Kansai International Airport	BOT	15,000
Argentina	Buenos Aires water and sewer services	ROT, 30 years	4,000
Thailand	TelecomAsia communications network	BTO, 25 years	4,000
China	Daya Bay nuclear power plant, phase 1	BOO	3,700
Malaysia	North-South toll expressway	BOT, 30 years	3,400
Mexico	Petalcalco coal-fired power plant	BOT	3,000
Thailand	Bangkok Elevated Road and Train System	BOT, 30 years	2,981

BOO = build-own-operate; BOT = build-operate-transfer; BTO = build-transfer-operate; ROT = rehabilitate-operate-transfer.

Source: World Bank, Private Infrastructure Project Database.

TABLE 2 TOP TEN INFRASTRUCTURE PRIVATIZATIONS, 1984–SEPTEMBER 1995

Location	Privatization	Share sold (percent)	Price (US\$ millions)
Japan	Nippon Telegraph & Telephone (NTT)	35	70,500
United Kingdom	British Telecom	100	22,800
United Kingdom	British Gas	100	7,600
Mexico	Telefonos de Mexico (Telmex)	100 ^a	7,540
France	Elf Aquitaine	38	6,200
Germany	Veag	100	5,144
Singapore	Singapore Telecom	11	3,800
Netherlands	Koninklijke PTT Nederland	30	3,750
United Kingdom	Scottish Power	100	3,665
Argentina	Telecom Argentina (Entel North)	100	3,200

a. Company was already 49 percent privately owned before the first sale of government shares in 1990.

Source: World Bank, Private Infrastructure Project Database.

structure amounted to some US\$60 billion a year on average during the past decade. Projects averaged about US\$0.6 billion in value, although about 80 percent of projects were valued at less.

Privatization activity has been dominated by sales of power companies and telecommunications companies and licenses. Sales of waste and transport companies have also been important. Greenfield investment has been most

prevalent in power and transport infrastructure projects, with most transport investment going to toll roads, tunnels, and bridges. Of course, the line between privatization and greenfield investment is fluid—many newly privatized telecommunications companies invest heavily in new facilities.

Telecommunications investments tend to be funded mostly with retained earnings, reflecting strong market growth and consumers' will-

THE PRIVATE INFRASTRUCTURE PROJECT DATABASE

The database tracks private infrastructure activity in gas, power, telecommunications, transport, waste, and water since 1984. In transport, the database covers roads, railroads, airports, and ports, but excludes rolling stock and airline privatizations. It does not track waste collection contracts.

The database includes information on:

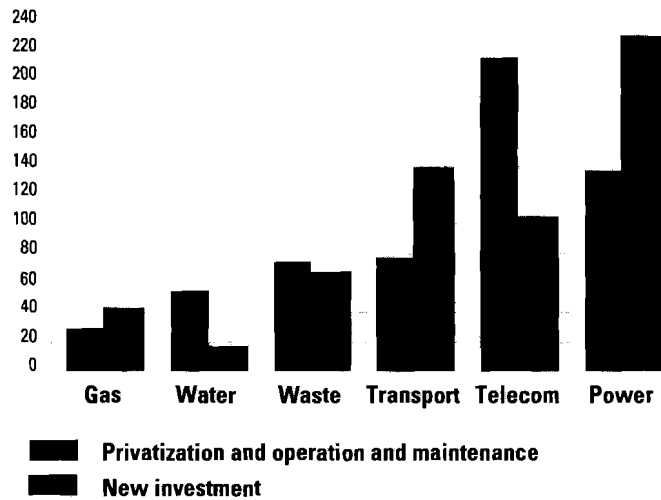
- A total of 3,394 projects as of September 1, 1995.
- *New investment*: BOO, BOT, LRO (lease-rehabilitate-operate), and other similar programs.
- *Privatization and O & M*: asset sales, operation and maintenance contracts, management contracts, and operating licenses.
- *Actual projects*: new investment projects under construction, completed, or operational and privatization and O & M projects that have been awarded or have begun operation.
- *Potential projects*: all projects under active study, bidding, or negotiation.

The first version of this Note, which appeared in June 1995, estimated the private infrastructure market at US\$30 billion. After a more intensive data gathering effort, this estimate was revised upward to US\$60 billion. There are several reasons for this dramatic increase:

- The number of projects in the database has grown from 1,346 to 3,394, mostly because of the addition of projects but also because of existing ones whose status as privately owned or operated projects could be confirmed.
- The status of some projects has shifted from potential to actual.
- Some project cost estimates have been increased on the basis of more recent information.

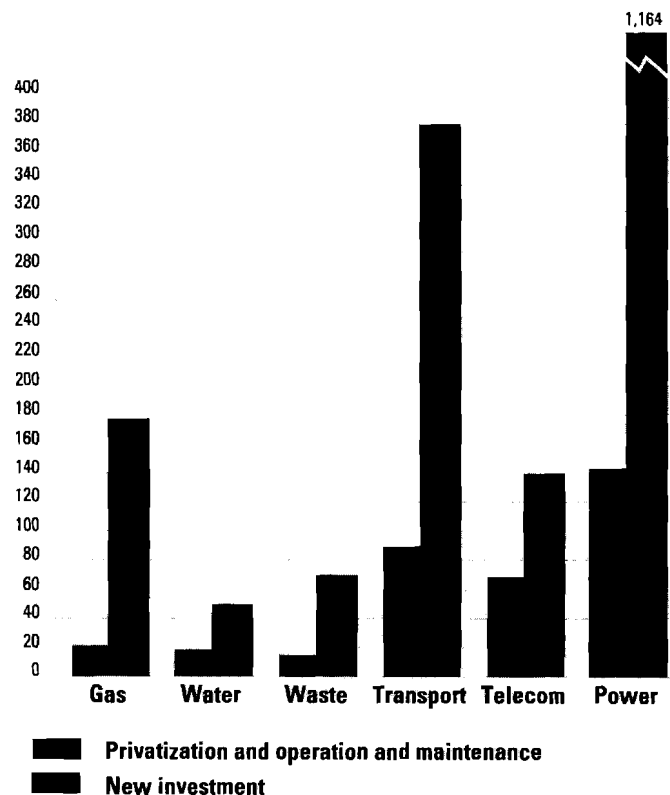
The database will continue to be regularly updated, and additional project information is thus actively sought.

FIGURE 1 PRIVATE INFRASTRUCTURE PROJECTS, BY SECTOR, 1984–SEPTEMBER 1995



Source: World Bank, Private Infrastructure Project Database.

FIGURE 2 POTENTIAL PRIVATE INFRASTRUCTURE PROJECTS, BY SECTOR, SEPTEMBER 1995



Source: World Bank, Private Infrastructure Project Database.

TABLE 3 TOP TEN POTENTIAL PRIVATE INFRASTRUCTURE PROJECTS, SEPTEMBER 1995

Location	Project	Contract	Cost/price (US\$ millions)
Russia	National long-distance telephone network	BO license	40,000
Belarus/Germany/Poland/Russia	Yamal gas pipeline	BOO	39,700
Hong Kong	Chek Lap Kok airport	BLO	20,000
Russia	RAO Gazprom	Privatization, 60%	20,000
Taiwan (China)	Taipei-Kaohsiung high-speed rail	BOT, 30 years	17,400
India	West Bengal coal-fired power plants	BOT	12,700
Germany	Deutsche Bundespost Telekom	Privatization, 25%	9,750
United Kingdom	Railtrack	Privatization	9,500
China/Hong Kong	Beijing-Hong Kong highway	BOT	8,000
Taiwan (China)	Kaohsiung rapid transit system	Privatization	7,600

BO = build-operate; BLO = build-lease-operate; BOO = build-own-operate; BOT = build-operate-transfer.

Note: Excludes the US\$52 billion Three Gorges Dam in China. The dam is under consideration as an independent power project but no detailed proposal has appeared.

Source: World Bank, Private Infrastructure Project Database.

ingness to pay for service. Many other infrastructure ventures face more uncertain financial prospects because of political difficulties in raising and regulating utility tariffs. Investors often try to manage these risks by seeking limited recourse or nonrecourse project finance.

Some geographic patterns have emerged in the past decade in private infrastructure investment. Not surprisingly, the fast-growing countries of Asia are emphasizing new investment, which accounts for more than 70 percent of the private infrastructure activity in these countries. Two countries in the region are the clear front-runners—the Philippines, with forty-four new investment projects, mostly in power, and China, with thirty-five, mostly in transport and power. Other countries with significant numbers of projects are Mexico, with fifty-four, mostly in toll roads, and the United Kingdom, with fifty-two. With 113 projects, the United States still leads overall, in large part because of its active independent power industry.

The United States also leads in privatizations, with 147. Many of these transactions are related to the recent sale of regional cellular licenses. But most privatization activity was concentrated in Latin America and OECD Europe. The United Kingdom has privatized fifty-

two infrastructure companies, and Argentina forty-eight. Major privatization programs are under way in Chile and Mexico, as well as a host of privatizations, mostly in telecommunications, in countries ranging from Belize to Uruguay.

And the future? The database is tracking 2,273 potential projects—349 privatizations worth some US\$480 billion and 1,924 new investment projects that could cost up to US\$1,347 billion. The average size of these potential projects is about US\$0.8 billion, suggesting that 75 new deals a year would keep the market at US\$60 billion. That would be in line with recent trends, although new investment will probably take over from privatization as the driver of the market.

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The Private Infrastructure Industry— Company Approaches

Jae So and Ben Shin

The global private infrastructure industry has experienced rapid growth over the past fifteen years and attracted some 1,700 companies. Infrastructure was generally managed by national, single-sector utilities, but technological and regulatory change has allowed companies to cross traditional boundaries. Although core competencies in specific sectors are still important, companies are beginning to exploit new sources of competitive advantage, such as the ability to efficiently manage an integrated network of diverse services (table 1). Electric utilities in Germany—RWE, Viag, and Veba—are entering telecommunications markets on the strength of their extensive cable and electricity distribution networks and their experience operating massive, companywide internal telecommunications networks. WMX Technologies of the United States is adding wastewater

treatment plants and waste-to-energy ventures to its waste management repertoire.

This Note briefly surveys the origins of some of these global infrastructure companies (see table 2 for the ten most active ones) and shows how major companies are diversifying across sectors and regions (tables 1 and 5). It also gives a flavor of the approaches companies use to compete in the evolving market and discusses some of the risks they face.¹

Origins

The growth of some companies has its origins in recent deregulation and privatization. Many U.S. utilities, faced with an increasingly mature home market, are taking advantage of the Public Utilities Holding Companies Act of 1992,

The first edition of this Note, issued in June 1995, was based on data collected to December 1994 in the Bank's Private Infrastructure Project Database. This edition reflects data collected through early September 1995. See also pages 37–40.

TABLE 1 COMPANIES' SECTORAL DIVERSIFICATION, 1984–SEPTEMBER 1995

Company	Gas	Power	Telecom	Transport	Waste	Water	
Bechtel Group, Inc. (United States)	■	■		■	■		
Bouygues SA (France)	■	■	■	■	■	■	Actual projects ■
Compagnie Générale des Eaux (France)	■	■	■	■	■	■	Potential projects □
Électricité de France	■	■			■	■	
Grupo ICA (Mexico)	□	■		■	■	■	
Lyonnais des Eaux-Dumez (France)		■		■	■	■	
Severn Trent Plc. (United Kingdom)		■		■	■	■	
Siemens AG (Germany)	□	■	■	□		■	
Soldati (Argentina)		■		■	■	■	
Tractebel SA (Belgium)	■	■			■	■	

Source: World Bank, Private Infrastructure Project Database.

**TABLE 2 TOP TEN DEVELOPERS BY NUMBER OF PROJECTS,
1984–SEPTEMBER 1995**

Company	Projects
Compagnie Générale des Eaux (France)	74
Cable and Wireless Plc. (United Kingdom)	49
WMX Technologies Inc. (United States)	39
Lyonnais des Eaux-Dumez (France)	38
France Telecom	34
Sprint Corp. (United States)	33
Cox Cable Communications Inc. (United States)	31
AT&T (United States)	30
Comcast (United States)	29
Tele-Communications Inc. (United States)	29

Source: World Bank, Private Infrastructure Project Database.

**TABLE 3 TOP TEN DEVELOPERS WITH STATE OWNERSHIP,
1984–SEPTEMBER 1995**

Company	State share (percent)	Projects
France Telecom	100	34
Électricité de France	100	24
Telefónica de España (Spain)	32	9
China International Trust and Investment Co.	100	7
Deutsche Telekom (Germany)	100	6
RWE AG (Germany)	29	5
IRI Group (Italy)	100	4
Telecom Finland OY	100	4
Telia AB (Sweden)	100	4
Singapore Telecom	89	3

Source: World Bank, Private Infrastructure Project Database.

**TABLE 4 TOP TEN DEVELOPERS FROM DEVELOPING COUNTRIES,
1984–SEPTEMBER 1995**

Company	Projects
Grupo ICA (Mexico)	16
Tribasa SA (Mexico)	16
Grupo Mexicano de Desarrollo (Mexico)	12
China International Trust and Investment Co.	7
Naviera Perez Companc (Argentina)	7
Empresa Nacional de Electricidad SA (Chile)	6
Compania Chilena de Generación Eléctrica SA (Chile)	5
Grupo Macri (Argentina)	5
Soldati (Argentina)	5
Techint Compania Técnica Internacional (Argentina)	5

Source: World Bank, Private Infrastructure Project Database.

which allows them to venture into new markets. Privatization has prompted such companies as British Gas and British Telecommunications to seek additional shareholder profits in overseas ventures. Some investors are driven by a need for secure supply. Germany's largest gas company, Ruhrgas, is investing in countries key to regular supply—countries in Eastern Europe and the former Soviet Union. Other companies are taking advantage of a historical head start. French water companies, for example, are exploiting their long experience in operating private water concessions at home in newly private ventures abroad.

Many companies competing in private infrastructure markets are publicly owned at home, such as Électricité de France (see table 3 for the top ten developers with state ownership). Telefónica of Spain and France Telecom bid aggressively for telecommunications companies in emerging markets. And firms from emerging markets are themselves poised to become developers. Tribasa, a Mexican construction company, building on its toll road experience, acquired the capability to arrange financing and is branching out into other infrastructure ventures, including water supply and waste disposal (see table 4 for the top ten developers from emerging markets).

Companies such as Asea Brown Boveri and General Electric, traditional equipment suppliers for public and private utilities, are diversifying into project development so as to benefit from control over the entire project, rather than only bidding for the equipment contract in the final stages. Along with equipment suppliers, engineering companies such as Fluor Daniel and Black & Veatch are taking a more active role in financing projects previously in the public sector and in some cases are functioning as developers. And companies such as Hopewell Holdings have built on their experience as project managers to become project developers; able to build good working relationships with governments, they can expedite complex contractual arrangements in uncertain regulatory and legal environments.

Approaches

From these origins, infrastructure companies are adopting a range of competitive strategies,

TABLE 5 COMPANIES' GEOGRAPHIC DIVERSIFICATION, 1984-SEPTEMBER 1995

North America	Latin America and the Caribbean	OECD Europe	Eastern Europe and CIS	Middle East and Africa	Asia and the Pacific	
FRANCE TELECOM US\$13,300						
Canada United States	Argentina Mexico	Germany Greece Italy Portugal Spain United Kingdom	Poland Russia Turkey	Central African Republic Chad Djibouti Egypt Equatorial Guinea Gabon	Guinea Israel Madagascar Mali Mayotte Morocco Niger Réunion South Africa	India Japan New Zealand Pakistan Vanuatu
CABLE AND WIRELESS PLC. (UNITED KINGDOM) US\$3,949						
United States	Barbados Jamaica Puerto Rico Trinidad and Tobago	France Germany Ireland Italy Netherlands Sweden	United Kingdom	Belarus Bulgaria Kazakhstan Latvia Russia	Bahrain Republic of Yemen Seychelles Sierra Leone South Africa	Australia Bangladesh China Hong Kong Japan Maldives Pakistan Republic of Korea Solomon Islands Taiwan (China) Vanuatu
COMPAGNIE GÉNÉRALE DES EAUX (FRANCE) US\$28,227						
Canada United States	Argentina Mexico	Belgium France Germany Italy	Portugal Spain United Kingdom	Hungary	Gambia Guinea	Australia Malaysia Pakistan
LYONNAISE DES EAUX-DUMEZ (FRANCE) US\$27,528						
United States	Argentina Mexico	France United Kingdom	Czech Republic Hungary Lithuania	Gabon Guinea-Bissau	Australia China Macao	Malaysia Thailand
TRACTEBEL SA (BELGIUM) US\$7,204						
Canada United States	Argentina	Belgium France Germany Luxembourg Norway	Portugal Spain United Kingdom	Belarus		
ÉLECTRICITÉ DE FRANCE US\$11,643						
	Argentina	Belgium Portugal Spain	Poland	Côte d'Ivoire Gabon Guinea	Guinea-Bissau Mali	China
AT&T (UNITED STATES) US\$6,363						
Canada United States	Argentina Puerto Rico Venezuela	France Spain	United Kingdom	Ukraine		New Zealand Philippines
EMPRESA NACIONAL DE ELECTRICIDAD SA (SPAIN) US\$2,830						
	Argentina Colombia Costa Rica El Salvador Guatemala Honduras Nicaragua Panama Peru	Spain Portugal				

Note: Dollar amounts indicate total cost of projects (in millions); for a project involving more than one developer, the full cost is added to each developer's total.
Source: World Bank, Private Infrastructure Project Database.

from sectoral diversification based on core functional skills to a focus on subsectors and single functions:

- **Municipal focus.** France's Compagnie Générale des Eaux focuses on developing and maintaining relationships at the municipal level and has expanded into other municipally oriented services such as hospitals, cable television, parking facilities, passenger transport, and urban property development. Citizens Utilities in the United States is beginning to explore the potential for efficient distribution and delivery of an integrated range of services to the household, including gas, power, water, and telecommunications.
- **Regional focus.** Telefónica de España, in its aggressive pursuit of Latin American telecommunications privatizations, can be seen as capitalizing on its knowledge and common understanding of the consumers' culture and language. Hong Kong-based Hopewell Holdings' familiarity and trust with the Chinese government resulted in the opportunity to develop two power plants in China.
- **Vertical development.** Some companies are hoping to realize vertically integrated infrastructure networks. Tribasa plans to develop intermodal transport corridors in Mexico with ports, toll roads, and service facilities that improve logistics for manufacturing firms relying on just-in-time delivery methods.
- **Construction focus.** Large construction companies such as Grupo Mexicano de Desarrollo have focused on projects with significant construction components, such as toll roads and wastewater distribution systems, to take advantage of their expertise.
- **Narrow segment focus.** Enron of the United States bases its strategy around natural gas, concentrating on gas transport and distribution and gas-fired power plants. Its financial and risk management skills have allowed it to develop innovative financing schemes and tap new classes of investors.

Risks

Infrastructure companies face three key challenges. First, as companies adopt more of an

ownership approach to infrastructure projects, they must have the ability to pull the deal together and connect the network of companies that will supply services. Development costs—mostly staff time and travel to put the deal together—can be 3 to 5 percent of the cost of projects worth several hundred million dollars. Second, to conclude a deal, companies must also be able to arrange a favorable financing package. Companies have approached the issue in a variety of ways. Asea Brown Boveri makes full use of export credit financing for its projects. Enron constantly pushes the frontier in tapping capital markets.

Third, although development teams breathe a sigh of relief once a project is funded and construction begins, regulatory problems may be just about to start. Highly visible problem cases have been Cogasco, a natural gas pipeline project in Argentina that went awry in 1982, and the more recent troubles of the Bangkok Expressway. In both instances, regulatory authorities failed to live up to the spirit of the contract. Whether the trend toward private infrastructure is sustained will depend on transparent and competitive solutions that render price regulation unnecessary or, where that is not possible, price regulation that balances the interests of developers, consumers, and governments. Ultimately, it is in the developers' interest to help establish the system that will regulate their behavior. Such companies as AT&T of the United States, Germany's RWE, and Hong Kong's China Light and Power have actively helped to develop regulatory solutions, which allowed them to deflect pressure for nationalization.

¹ This Note draws on a new database under development in the Private Sector Development Department of the World Bank. The Private Infrastructure Project Database tracks private infrastructure activity worldwide and attempts to provide a comprehensive survey of private projects in gas, power, telecommunications, transport, water, and waste since 1984. See also pages 37–40.

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State-Owned Enterprise Restructuring

Better performance through the corporate structure and competition

Russell Muir and Joseph Saba

The modern corporation—as an ownership and management structure

The legal structure of the modern corporate form has four fundamental elements—separate identity, limited liability for shareholders, centralized management, and transferability of shares. These, together with the dynamics of the governance relationship between the owners (shareholders), the supervisory board (board of directors), and the executives of the firm, provide what can be called internal incentives for efficiency.

The legal form, while necessary, is not sufficient to ensure efficiency, however. In addition to the internal incentives, certain external incentives must be in place for sustainable efficiency gains. Corporate performance is influenced by external pressures from competition in product, factor, debt, and equity markets and by regulation (company and securities law, bankruptcy law). The interplay of the internal and external incentives causes the managers to act in accordance with the goals of efficiency and profitability set by the owners—and causes the modern corporation to act with a clarity and singleness of purpose. The absence of any of the internal or external incentives can seriously undermine performance.

The SOE—as a modern corporation

Countries as diverse as Chile, New Zealand, the Republic of Korea, Sweden, and the United Kingdom have tried, with some success, to reform their state-owned enterprises (SOEs) by imposing on them the same framework of internal and external incentives that applies to the successful modern corporation. This Note

reviews the measures that appear to be the most crucial in improving performance.

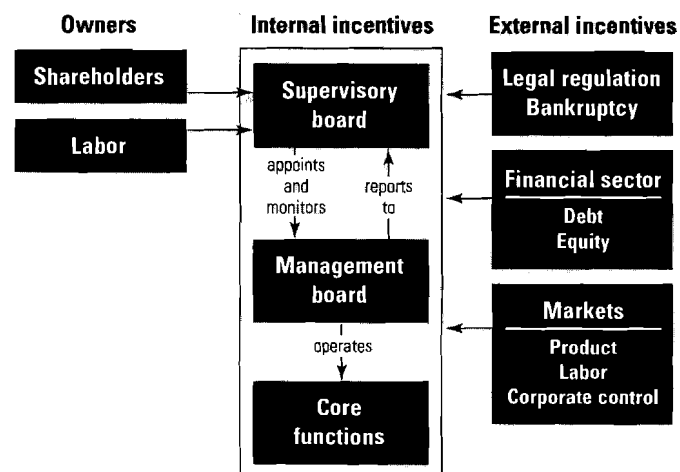
Internal incentives

Clarify the principal and agent incentives

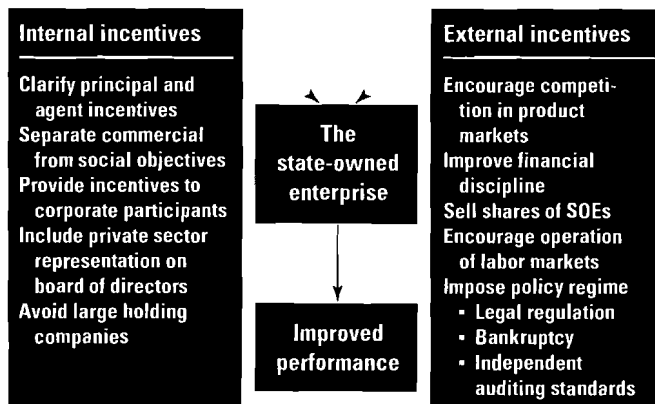
Principal and agent incentives are best clarified through three mechanisms. First, property rights should be defined, used, and accounted for under the same rules as pertain to modern private sector corporations. In practice, many SOEs have been operated as if part of a government agency. Often their accounts resemble those of a government office and as a result cannot be relied on by creditors nor used to evaluate performance against similar private firms.

Second, the corporation and its owners should have separate legal identities to insulate man-

FIGURE 1 THE MODERN CORPORATION AS AN OWNERSHIP AND MANAGEMENT STRUCTURE



**FIGURE 2 INTERNAL AND EXTERNAL INCENTIVES:
KEY LESSONS OF EXPERIENCE**



agement from political leadership. One of the most common features of inefficiently run SOEs has been continual intervention by the state's designated representative in day-to-day management (to achieve noncommercial goals), to the detriment of the enterprise's profitability.

Third, among successfully reformed SOEs, share transferability has turned out to be a fundamental attribute. In private sector firms, the residual risk bearers must have effective control over management decisionmaking or have the ability to sell their ownership rights to new owners (for example, through the sale of shares to a strategic investor). But in SOEs, the residual risk is borne by the entire population—taxpayers and consumers—which has no easy way to control the enterprise or to sell its ownership rights. So the incentives for state agencies to ensure that SOEs perform efficiently are weakened. While a corporatized SOE like Coalcorp in New Zealand or Statoil in Norway may look like a privately owned enterprise, it lacks the discipline imposed by residual risk. This deficiency could undermine all the other reforms. Many countries, including New Zealand and the United Kingdom, have confronted this problem by going beyond restructuring and diversifying SOE ownership. In some cases, these countries have fully divested SOEs to secure the full benefits of diversified ownership.

Separate commercial from social objectives

Many SOEs are told to pursue a complex agenda of social and political targets that often conflict with sales or profit-maximizing objec-

tives. For example, SOEs often face pressures to generate or preserve high levels of employment. While SOEs can act as model employers, honor labor market legislation, and provide comprehensive benefits to employees, the reality of their employment strategies is not encouraging. Many SOEs are overstaffed, with unacceptably low levels of productivity, absenteeism well above the private sector average, and unbridled growth in nonmonetary benefits. These conditions place too heavy a financial burden on the enterprise and make targets set by the government unattainable. The temptation to mix social and commercial objectives should be resisted. Governments should set commercial objectives for SOEs and give them incentives similar to those that apply to private firms. Where social objectives are imposed, the cost should be identified and the enterprise fully compensated.

Provide incentives to corporate participants

Effective internal governance for corporatized SOEs has been achieved when the state has provided adequate incentives to boards, managers, and employees to meet commercial objectives. Efforts to seek efficiency gains through increased managerial autonomy in the day-to-day operations of the SOE will inevitably fail if the financial rewards for management are insufficient. The more efficient reformed SOEs—such as Statoil, Semen Gresik (Indonesian cement), Usinor Sacilor (French steel), and Coalcorp—have all recognized that to attract and retain top-level managers willing to assume their full responsibilities, the link with typically rigid and inflexible civil service pay and conditions must be severed. These SOEs have offered terms and conditions more akin to the risks and rewards in private firms and have sought to compete with private firms in hiring experienced and competent management. Incentives for employees—such as profit sharing and equity distribution—have also worked well.

Put the private sector on boards

It is important to establish a strong board structure to develop the overall strategy for the SOE and to monitor the performance of management.

But choosing board members on the basis of strong political ties or alliances should be avoided. This usually encourages political interference in the day-to-day operation of the business and will achieve little by way of improved corporate governance. A more effective way of ensuring that boards perform their strategic and monitoring role is to introduce private sector representatives. In Norway, Statoil has had nongovernment representatives on its board for some time, as have the French steel firm Usinor Sacilor, all the large Korean SOEs (known as government invested enterprises), and, more recently, Semen Gresik in Indonesia. But experience shows that maintaining the distance between politics and business is difficult. In New Zealand, the SOEs that have not yet been privatized have begun to suffer from the reemergence of interference from politicians.

Avoid large holding company structures

International experience suggests that the significant disadvantages of large holding companies far outweigh any limited advantages they were perceived to have—such as centralized support services and economies of scale in procurement. Holding structures create additional layers of bureaucracy, they fail to shield the operating companies in the group from undue political intervention, they allow cross-subsidization between the companies, and they distort signals and incentives for management. Finally, it is notoriously difficult to control their growth and longevity once they are established. Experience in France (Usinor Sacilor), India (Hindustan Machine Tools), Italy (IRI), and Turkey (Sumer Holdings), as well as in Algeria, Egypt, and Kazakhstan, amply demonstrates many of the drawbacks of these structures.

External incentives

Encourage competition

Perhaps the most important external factor in performance is the degree of competition that the enterprise faces. Statoil, the fully integrated Norwegian oil company, has had to compete vigorously in international markets against large multinational companies. As a consequence,

BOX 1 SEMEN GRESIK: THE IMPACT OF THE INITIAL PUBLIC SHARE OFFERING

In July 1991, Semen Gresik became the first Indonesian SOE to issue shares on the Jakarta Stock Exchange in order to finance a major capital investment project. This initial public offering comprised 27 percent of total share capital and generated about 280 billion rupiah (US\$140 million). Of the new shares sold, about 85 percent are held by foreigners, mostly institutional investors.

The successful listing of the company has led to significant changes in the management and oversight of the enterprise. First, under regulation 55/1990, the company became exempt from cumbersome government supervision and monitoring and onerous government procurement rules, and it enjoys greater flexibility in the sourcing of funds. Second, company performance has come under close scrutiny by the (minority) private shareholders. Public reporting now takes place every three months, and company finances are audited in line with international accounting standards by a reputed international auditing firm. Company performance is also scrutinized by external financial analysts, who publish periodic evaluations of the attractiveness of Semen Gresik's shares for current and potential investors. Management and government officials agree that the much closer scrutiny and the external pressures that have accompanied the listing of shares have led to greater transparency in the company's performance and created a greater sense of accountability by company management for efficiency improvements. While Semen Gresik's performance remained satisfactory in 1994, further improvements in efficiency and financial performance are expected as a result of new capital investments coming on stream.

both its owner—the Norwegian government—and its managers have been united in their resolve to match the efficiency levels of their larger private competitors in order to survive commercially, particularly in the absence of large state subsidies. Similarly, Coalcorp in New Zealand has maintained acceptable financial performance despite hard budget constraints and competition from other energy sources. This success has been due in large measure to the pressure Coalcorp faces in the domestic market, from forty to fifty privately owned coal mining companies, and in the international market, where the company is a small player in a highly competitive environment. The increases in Coalcorp's export sales in 1993 and 1994 are testimony to its emphasis on commercial practices and productive efficiency.

But governments sometimes prohibit competition between SOEs, even when there are many operating in the same sector, and restrict entry or competition from private sector firms. The Indonesian cement industry comprises nine companies, of which five—including Semen Gresik—are state owned. The government intervenes in the domestic market by setting regional benchmark prices and by allocating regional markets on the basis of proximity, installed capacity, and projected cement demand. Exports of cement must be authorized and are allowed only when domestic cement demand has been met. This market control system provides Semen Gresik and the other producers with captive regional markets. The minimal competition has led to supply bottlenecks and shortages. The government is therefore considering deregulating cement pricing and marketing to improve efficiency and provide incentives for investment in the sector.

Improve financial discipline: The role of debt

Creditors can exert a discipline akin to that imposed by shareholders. But where the state as owner protects its corporations from that discipline—usually by guaranteeing their debts—it removes a strong incentive for management to be efficient and it introduces the possibility of moral hazard. All too often—as in Italy, Japan, Pakistan, and Turkey, for example—governments have been unwilling or unable to impose debt market discipline on SOEs through the banking system. Turkey's Sumer Holdings is a case in point. With most loans to Turkey's SOEs backed by government guarantee, management has faced little commercial discipline in investment decisions. Bad SOE loans have become a major drain on the Turkish government's finances.

Improve performance through equity markets

Where there is an active equity market, diversified sales of SOE shares or the dilution of government ownership through rights issues can do much to improve a company's performance. Some of the external pressures that can

motivate improved governance can be created by selling even a minority portion of the government's shares to the private sector. More and more governments have done so in recent years (box 1). The market exerts an important discipline on management, demanding information flows and, through pricing of equity, evaluating management performance. Indeed, experience suggests that there are in fact systemic limits to SOE reforms that do not increase private participation in financing, management, and, especially, ownership.

Avoid complex monitoring

Some countries—France, Indonesia, Korea, Mexico, New Zealand, and Pakistan, for example—have put a great deal of effort into designing elaborate monitoring systems. These systems usually include management controls and complex formulas for various markets. Some are poorly designed; they distort incentives and are difficult to enforce. There is little hard evidence that these systems have been able to develop and—equally important—maintain objective performance benchmarks that reflect decisions that management can control. An efficient internal governance system coupled with the discipline of external incentives works better than these complex, centralized monitoring schemes.

This Note is based on a paper by the authors, *Improving State Enterprise Performance: The Role of Internal and External Incentives* (World Bank Technical Paper, Washington, D.C., forthcoming). The paper analyzes the modern corporate form and summarizes the international experience with state-owned enterprises. Eight SOE cases were chosen for detailed study: Semen Gresik (cement, Indonesia), Usinor Sacilor (steel, France), Statoil (oil and gas, Norway), Coalcorp (coal, New Zealand), IRI (holding company, Italy), Sumer Holdings (holding company, Turkey), Hindustan Machine Tools (India), and Ksiaz Porcelain Factory (Poland). This case study sample is skewed toward generally good performers drawn primarily from industrial and middle-income countries. The sample demonstrates just how difficult it is to achieve successful reform and to make it last while still maintaining state ownership.

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