

PUBLIC POLICY FOR THE

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Utility Regulators—The Independence Debate 9

Utility regulation is complicated by three related considerations. First, the prices of utility services are usually political. Second, investors are aware of this and of the vulnerability of their usually large, long-term, and immobile investments. Weak regulatory credibility will be reflected in higher capital costs and thus higher tariffs. During privatization this translates into smaller proceeds from sales of existing enterprises and higher financing costs for new projects. Third, the long-term nature of most infrastructure investments makes it difficult to secure credible commitments. Highly specific rules can provide assurance to investors but they make it difficult to adjust regulation to unforeseen developments, including changes in technology and market conditions. In designing regulatory systems, then, policymakers must resolve two fundamental challenges: How much discretion should regulators have? And how should that discretion be managed to reduce the risk of misuse and thus the cost of capital? The critical role of regulatory discretion is the main rationale for giving regulators independence. But creating an independent agency, no easy task in any setting, is even more challenging in countries with a limited tradition of independent public institutions and limited regulatory experience and capacity. **Warrick Smith** explains that the two main elements of independence—insulation from improper influences and measures to foster technical expertise—are mutually supporting: technical expertise can be a source of resistance to improper influences, and organizational autonomy helps in fostering (and applying) technical expertise. Independence also needs to be reconciled with measures to ensure that the regulator is accountable for its actions—and striking the proper balance between independence and accountability is notoriously difficult. Smith sets out possible paths of transition to greater independence and delegation of discretionary authority.

Utility Regulators—Roles and Responsibilities 13

Most regulatory agencies are responsible for administering tariff adjustment rules, elaborating service standards, monitoring compliance, and facilitating the settlement of disputes. **Warrick Smith** considers the optimal scope of agencies' industry coverage, their role relative to ministers, and their role relative to other regulatory objectives and bodies. Smith argues that making an agency responsible for more than one industry offers important advantages for efficiency and independence. While utility regulators' main focus is economic regulation, utilities are also subject to safety, antitrust, and environmental regulation. If different agencies are responsible, the role of each should be clearly defined to avoid duplication, uncertainty, and turf wars.

What is independence?

- Arm's-length relationships with politicians, firms, and consumers
- Earmarked funding and exemption from civil service salary rules to foster the expertise that will underpin the arm's-length relationships

Safeguards for independence

- Distinct legal mandate
- Professional criteria for appointment
- Executive and legislative branches involved in appointments
- Fixed terms with protection from arbitrary removal
- Staggered terms of appointment
- Exemption from civil service salary rules
- Reliable funding—such as earmarked levies

Accountability measures

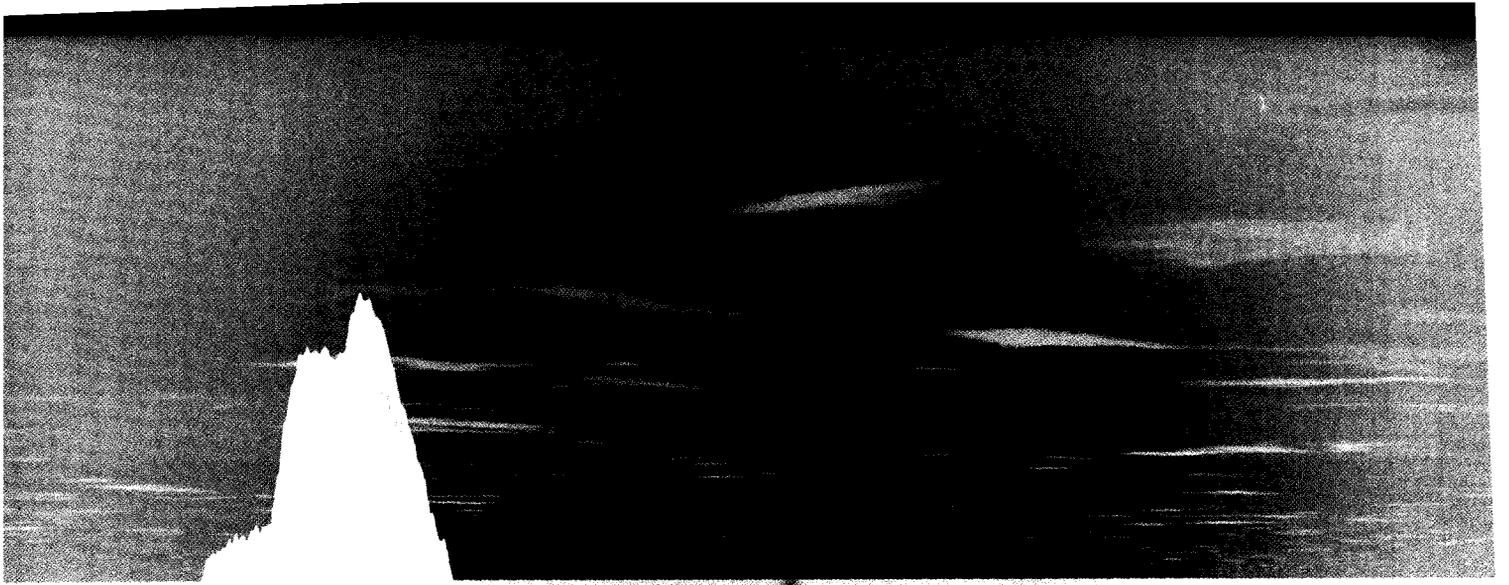
- Rigorous transparency—including open decisionmaking and publication of decisions and the reasons for those decisions
- Appeals process
- Scrutiny of the agency's budget, usually by the legislature
- Prohibit conflicts of interest
- Subject the regulator's conduct and efficiency to scrutiny by external auditors or other public watchdogs
- Permit the regulator's removal from office in cases of proven misconduct or incapacity

The role of the regulator

- Administering tariff adjustment rules
- Elaborating standards of service and monitoring compliance
- Facilitating dispute resolution

Advantages of multi-industry coverage

- Sharing resources
- Facilitating learning across industries
- Reducing risk of industry or political capture
- Reducing the risk of economic distortions across sectors
- Dealing with blurred industry boundaries



Weak regulatory credibility will be reflected in higher capital costs and thus higher tariffs. During privatization this translates into smaller proceeds from sales of existing enterprises and higher financing costs for new projects.

Utility Regulators—Decisionmaking Structures, Resources, and Start-up Strategy 17

Utility regulators should be established as long before privatization as possible, even if their formal powers do not go into effect immediately. **Warrick Smith** explains that deciding on the decisionmaking structure is the first step in this process. Many countries entrust decisionmaking authority to a commission or board of three to five members; others prefer a single individual. Each approach has its strengths and weaknesses, and the choice often depends on a country's traditions and conditions, but agencies responsible for several industries usually choose a commission. To ensure that a regulatory agency makes decisions that are well informed and accepted as fair and legitimate, consumers, regulated firms, and other stakeholders must have the opportunity to present their views, though their participation in the decisionmaking body is inadvisable. The regulatory process will typically involve three main steps: providing people who have an interest in a decision with an opportunity to present their views, publishing the decision and the detailed reasons for reaching that decision, and giving stakeholders an opportunity to challenge the decision through an appeals process. The appeals process is important to ensure that the regulator does not stray from its mandate and that it remains accountable. The nature of the appellate body and the grounds for appeal are also important decisions. If the regulatory agency is independent, the appellate body should be independent. The grounds of appeal are usually limited to errors of fact or of law—appellate bodies generally are not allowed to reconsider the merits of the decision.

Decide decisionmaking structure

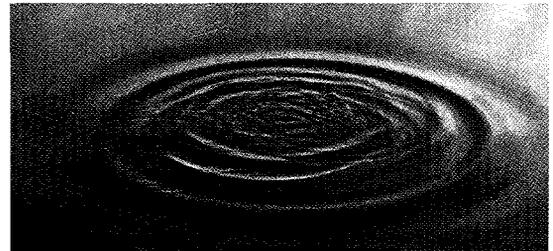
- Individual or commission
- Selection process (set qualifications in law, prohibit conflicts of interest)

Include other stakeholders in the regulatory process

- Open regulatory process to public consultations
- Establish advisory boards

Set up an appeals process

- Decide on the appellate body
- Define possible grounds for appeal



UTILITY PRICING

Utility Regulation—A Critical Path for Revising Price Controls 21

The United Kingdom has pioneered the use of price control regulation. The periodic review of these controls lies at the core of the mechanism, and the U.K. experience shows that this review is complex and time-consuming—and can be controversial. Based on the U.K. experience **Richard Green** proposes a sequence of tasks that regulators in other countries could use when revising price controls. He argues that regulators should start to reset controls at least two years before new controls are due to come into effect. Much information will be required, and it will all have to be checked and processed before the regulator can propose new controls. In addition, most regulatory systems include an appeals mechanism to protect companies against overly zealous regulators, so regulators must make their proposals early enough to allow for a possible appeal. These considerations imply that regulators should make their proposals at least nine months before new controls are due to take effect, to allow six months for an appeal and time to implement the eventual decision.

Regulators should start to reset price controls at least two years before new controls are due to come into effect

- Request information two years ahead
- Assess and amend information eighteen months ahead
- Determine rate of return about fifteen months ahead
- Select price control about twelve months ahead
- Publicly announce price control at least nine months ahead
- Allow three to nine months for appeal
- Implement one month ahead

Has Price Cap Regulation of U.K. Utilities Been a Success? 25

Price controls—typically reviewed every five years in the United Kingdom—have been controversial. **Richard Green** traces the development of U.K. price controls and explains that the initial controls for electricity and water companies, based on underestimates of the companies' scope for reducing costs, turned out to be overly generous, allowing them high profits. While some analysts have suggested annual profit sharing regulation, the practical problem is that annual profit sharing would place a heavy information burden on firms and regulators and would weaken companies' incentives to lower costs. Although the utilities are still unpopular in the United Kingdom, most experts would be willing to defend the periodic price control system as one that gives companies an incentive to cut costs and return the gains to consumers after a short time. The high profits of the early 1990s were due largely to unanticipated, one-time productivity gains following privatization that are unlikely to be repeated. The established method for resetting price controls makes further "mistakes" unlikely.

Network Industries, Incentive Regulation, and Profit Sharing 29

The U.K. system of periodic price controls has a lot going for it: is a type of profit sharing system that strikes a good balance between incentives to perform and equitable distribution of performance gains between consumers and shareholders. Yet critics of the system, concerned about the large profits generated by newly privatized utilities, have proposed annual profit sharing schemes. **Peter Vass** argues that such schemes would reduce firms' incentives to improve efficiency and could lead to higher costs for consumers. Vass says that many of the concerns about utility profits have already been addressed with better mechanisms—introducing automatic correction factors to eliminate windfall gains and encouraging utilities to voluntarily accelerate the return of benefits to customers. Better communication of the principles of incentive regulation is required, however.

The Distribution of Gains from Utility Privatization and Regulation in Argentina 33

One of the main arguments for privatizing infrastructure services is that private owners and operators use resources more efficiently than public ones. Empirical tests of this assumption have generally focused on privatization's effect on sector performance. Are consumers paying less? Is the quality of service better? Has investment increased? These tests tend to ignore the potential effects of changes in the privatized sector's performance on the rest of the economy. Yet some of the main arguments against privatizing infrastructure services are that it can hurt the rest of the economy, increase unemployment, and make the poor poorer and the

Rate-of-return regulation, the traditional form of utility regulation in the United States, gives companies little incentive to improve efficiency and may encourage inefficient activities

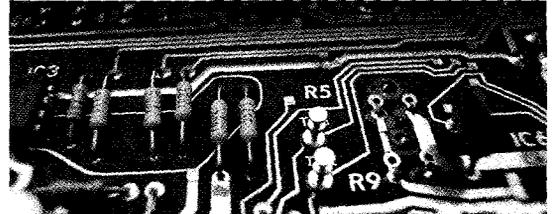
Price control regulation gives companies a greater incentive for efficiency

The quid pro quo for lower prices tomorrow is higher profits today



When regulators are effective, the poor tend to gain relatively more than higher-income groups, improving the distribution of income

richer. Empirical tests of these opposing arguments are not straightforward, since infrastructure privatization is typically only one of many items on the reform agenda of governments undertaking major structural adjustments. That was the case in Argentina, where the agenda included macroeconomic reforms as well as privatizing infrastructure services. A recent study by **Omar Chisari, Antonio Estache, and Carlos Romero** tries to separate the effects of privatization and regulation policies. The study shows that in Argentina the gains from private operation of utilities are about US\$3.2 billion a year, or 1.25 percent of GDP, and that all income groups benefit. Ineffective regulation cuts the gains from reform by nearly US\$1 billion, or 0.35 percent of GDP. This represents an implicit tax of 16 percent on the average consumer, paid directly to the owners of the utilities. When regulators are effective, the poor tend to gain relatively more than higher-income groups, improving the distribution of income. Thus, rather than illustrating a tradeoff between efficiency and equity, the study shows that privatization can deliver on both counts. The model indicates that the rapid increase in unemployment in Argentina in the mid-1990s was the result of the “tequila” effect, and that the gains from privatization were not able to offset it.



TRANSPORT REFORM

How Competition Delivers Positive Results in Transport— A Case Study 37

In this case study the government, initially the monopoly supplier of transport services (air, jetfoil, and ferry), opens the market to new entrants. This sets off a chain of events leading to cheaper, more frequent, and more attractive services and a surge in demand. **Ginés de Rus** offers several useful lessons. Open entry can lead to big gains for consumers. More comprehensive demand elasticities and the generalized cost (price, time, and quality) of transport should be used in evaluating new policies and forecasting demand. A new ferry service, seemingly unattractive because of its high time cost, was in fact highly attractive to consumers because of the value they ascribe to different components of travel time—the possibility of taking their own cars on the ferry changed the value users assigned to the time spent traveling. The case study also shows that brave new entrants can mutate into timid incumbents, suggesting that the market is well served by liberalization but that some kind of regulation would benefit the general interest. Competition policy is not as simple as lifting barriers to entry and eliminating regulation. It is a process of re-regulation in which the market plays the leading role in allocating resources. Antitrust regulation is also essential, however.

The different values consumers place on different kinds of travel time can create market opportunities not foreseen in the typical demand elasticities used by policy planners and forecasters



Global Trend to Railway Concessions Delivering

Positive Results 41

Louis S. Thompson and **Karim-Jacques Budin** review a number of recent innovative rail concessions. Each country has approached its problems differently, and each provides different insights into what can be achieved with concessions. But all the cases show that restructuring and substantial government investment in the design of a concession pay off. Concessionaires can do exactly what is expected—increase traffic, improve service, and enhance labor and asset efficiency—if they are allowed to do so. A growing number of companies and consortiums are interested in investing in railway concessions if the concessions are offered on reasonable terms. And because both “positive” (where the concessionaire pays the government an agreed sum for the concession rights) and “negative” (where the government pays the concessionaire to operate and maintain the property) concessions are possible, loss-making but socially necessary services can also be concessioned. Perhaps the most important innovation in railway organization over the next few decades will be in the European Union. Regulatory changes have ignited a clear trend in the EU toward institutional separation of infrastructure from operations because infrastructure is seen as a state responsibility while operations (except for social services) are seen as commercial. One eventual result of institutional separation will be franchising or even privatization of most freight services and possibly intercity passenger services.

The Benefits of Separating Rail Infrastructure from Operations 49

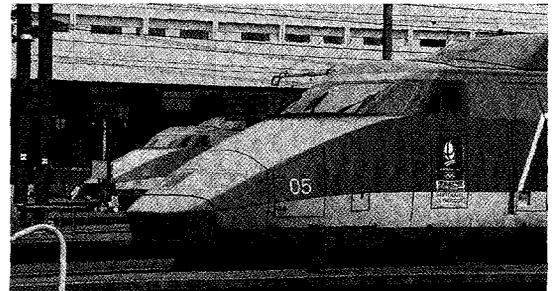
Louis S. Thompson offers a number of reasons for separating rail infrastructure from operations: to reduce unit costs, to create intrarail competition, to better focus on the services to be provided, to clarify public policy, and to strike a better balance between the roles of the public and private sectors. Moreover, recent experience with “negative” concessions, in which the private sector provides public services (based on competition to provide the service and in return for compensation), is adding another dimension to the “public vs. private” debate. In this sense separating infrastructure allows new approaches to the problem of meeting public responsibilities. Concessioning programs in Argentina, Sweden, and the United Kingdom define the broad alternatives in rail infrastructure separation. The two main challenges for separation are capacity management and pricing policies. While it is true that infrastructure separation is messy and expensive, it will be a small price to pay if “fragmentation” offers a better fit for consumers.

Case studies

- Argentina
- Brazil
- Chile
- Mexico
- United Kingdom
- Côte d’Ivoire and Burkina Faso

Lessons

- Concession term must be consistent with investment objectives
- Concessioning process should be done quickly to avoid rundown of assets
- Severance packages are essential
- Government should be wary of assuming commercial risks
- Defining the winner is not easy
- Pool of rail investors is growing
- Loss-making but socially necessary services can also be concessioned



Why separate?

- Reduce costs
- Create competition
- Clarify public policy

Three models

- Sweden
- United Kingdom
- Argentina

Two critical issues

- Capacity management
- Pricing

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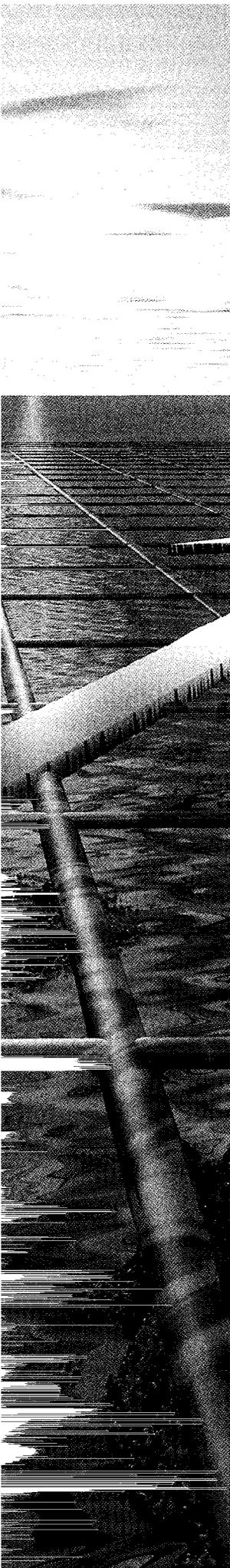
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Utility Regulators—The Independence Debate

Warrick Smith

The global trend of utility privatization has pushed regulatory issues to the fore, among them the role of regulatory agencies. These agencies have a long history in the United States, and creating or strengthening them has become a central goal of reforms around the world. But many issues remain contentious, particularly the notion of agency independence. Some governments are reluctant to surrender political control over regulatory decisions. And even those who agree on the desirability of independent agencies may question whether they are feasible or appropriate in all country settings. This Note considers the debate over the independence of utility regulators, focusing on the situation in developing countries.

Independence—What and why?

Independence is subject to different interpretations. Some use it interchangeably with *autonomy*; others perceive greater or lesser differences in meaning between the terms. This Note defines independence for utility regulators as consisting of three elements:

- An arm's-length relationship with regulated firms, consumers, and other private interests.
- An arm's-length relationship with political authorities.
- The attributes of organizational autonomy—such as earmarked funding and exemption from restrictive civil service salary rules—necessary to foster the requisite expertise and to underpin those arm's-length relationships.

The rationale for giving regulators independence as broadly defined here lies in the special challenges posed by utility regulation, including the critical role of regulatory discretion.

Regulatory challenges

Utility regulation has three main aims: to protect consumers from abuse by firms with substantial market power, to support investment by protecting investors from arbitrary action by government, and to promote economic efficiency. While there is growing recognition that competition can reduce the need for regulation in utility industries, most industries contain some areas of monopoly where the benefits of regulation potentially outweigh the costs.

Regulating utilities is complicated by three related considerations. First, prices for utility services are usually political. There are no votes in raising utility prices, and history is replete with examples of justifiable price increases being withheld at the expense of investors and the long-term interests of consumers.

Second, investors are aware of these pressures and of the vulnerability of their usually large, long-term, and immobile investments. Unless a government has made a credible commitment to rules that ensure an opportunity to earn reasonable returns, private investment will not flow. Weak credibility will be reflected in higher capital costs and thus higher tariffs. During privatization this translates into smaller proceeds from sales of existing enterprises and higher financing costs for new projects.

Third, the long-term nature of most infrastructure investments makes creating credible commitments difficult. Highly specific rules, if considered sustainable, can provide assurance to investors and lower the cost of capital. But they make it difficult to adjust regulation to unforeseen developments, including changes

in technology and market conditions. They also make it difficult to tailor responses to situations and to provide incentives for efficiency. There is thus an important tradeoff between reducing the risk of expropriation, and with it the cost of capital, and retaining the flexibility to pursue efficiency and other objectives.

In designing regulatory systems, then, policy-makers need to resolve two fundamental challenges: How much discretion should regulatory systems contain? And how should that discretion be managed to reduce the risk of misuse and thus the cost of capital?

How much discretion?

The discretion in regulatory systems differs widely among countries and industries. At one extreme, U.S. laws typically delegate broad discretion to regulators, often vaguely defining pricing standards as “just and reasonable” and limiting other powers only by reference to broad public interest criteria. At the other end of the spectrum, some countries implement regulation through tightly specified laws or contracts that seek to eliminate discretion. They attempt to deal with all contingencies foreseen at the time an arrangement is finalized, usually relying on detailed cost-based formulas for tariff adjustments. This approach—sometimes called “regulation by contract”—is often favored by investors who perceive a high risk of misuse of discretion by the government or regulator. Adjustments to the initial arrangement will require renegotiation, which can be difficult if the bargaining power of the parties changes once the investment is made.

Most regulatory systems lie somewhere between these extremes. Key policies and principles tend to be defined in laws, licenses, or contracts, which carefully delimit residual discretion through reference to criteria, factors, and objectives. Greater flexibility and discretion are usually more important in industries in which there is rapid technological change, in which the introduction of competition requires continuous adaptation of rules to changing market conditions, and in which high

priority is placed on providing incentives for efficient operation. Discretion is thus typically more important for telecommunications than for toll roads. Another consideration is a country’s stability and reputation for respecting private property rights: the higher a country scores on these criteria, the more discretion it can retain without significantly increasing the cost of capital. This consideration is especially relevant for reforming and developing countries, many of which lack a long track record of good performance in these areas.

How to manage discretion?

When discretion is retained on tariffs or other issues of concern to investors, the challenge is to manage it in a way that minimizes the risk of misuse. The exercise of discretion needs to be insulated from short-term political pressures and other improper influences and to be based on competent analysis.

Entrusting discretion to ministers will not meet these tests, particularly when the state continues to own utility enterprises. In this case there will be no arm’s-length relationship between the regulator and the firm, and there may be concerns that, in exercising discretion, ministers will favor the state enterprise over rival private firms. But even if the state has no ownership role, ministers will still be subject to short-term political pressures, and changes in government can lead to abrupt changes in regulatory policy. Restrictive civil service salary rules in many countries also make it difficult for ministries to attract and retain well-qualified professional staff. What is required is an agent at arm’s length from political authorities, utilities, and consumers. Organizational autonomy helps to foster the requisite expertise and preserve those arm’s-length relationships.

The quest for independence

Creating an independent agency, no easy task in any setting, is even more challenging in countries with a limited tradition of independent public institutions and limited regulatory experience

and capacity. The two main elements of independence—insulation from improper influences and measures to foster the development and application of technical expertise—are mutually supporting: technical expertise can be a source of resistance to improper influences, and organizational autonomy helps in fostering (and applying) technical expertise.

There is strong consensus on the formal safeguards required:

- Providing the regulator with a distinct legal mandate, free of ministerial control.
- Prescribing professional criteria for appointment.
- Involving both the executive and the legislative branches in the appointment process.
- Appointing regulators for fixed terms and protecting them from arbitrary removal.
- Staggering terms so that they do not coincide with the election cycle and, for a board or commission, staggering the terms of the members.
- Exempting the agency from civil service salary rules that make it difficult to attract and retain well-qualified staff.
- Providing the agency with a reliable source of funding, usually earmarked levies on regulated firms or consumers.

Formal safeguards of this kind are especially important in countries with a limited tradition of independent public institutions. But they are not enough. Persons appointed to these positions must have personal qualities to resist improper pressures and inducements. And they must exercise their authority with skill to win the respect of key stakeholders, enhance the legitimacy of their role and decisions, and build a constituency for their independence.

Some argue that governance traditions in some countries make independence illusory—“If the palace calls, the regulator will comply.” Certainly, adopting even the most sophisticated law will not magically transform the basic institutional environment. Nevertheless, for several reasons, creating such agencies is worth the effort, even in more challenging environments.

First and foremost, independence must be understood as a relative rather than an absolute concept. In any system the goal can only be to reduce the risk of improper political interference, not to provide ironclad guarantees. Progress must be measured at the margin—and relative to the outcome of ministers retaining direct control over regulatory decision-making. Second, the ability of independent agencies to sidestep civil service salary restrictions and to have access to earmarked funding makes it possible to recruit and retain better-qualified staff and to hire external consultants. This can improve the technical quality of decisions and thus enhance the agency’s authority. Adequate salaries can also help ease concerns about corruption. Finally, even if there are reasons to doubt that an agency will exercise truly independent judgment in the short term, that may change in the longer term. Concentrating expertise in a body with a specialist mandate sharpens commitment to professional norms, which can be an important source of resistance to improper influences. And as the regulator enters the fray, it will have the opportunity to build a constituency of its own, increasing insulation from political interference.

Reconciling independence with accountability

Independence needs to be reconciled with measures to ensure that the regulator is accountable for its actions. Checks and balances are required to ensure that the regulator does not stray from its mandate, engage in corrupt practices, or become grossly inefficient. Striking the proper balance between independence and accountability is notoriously difficult, but the following measures to do so have been adopted by a growing number of countries:

- Mandating rigorous transparency, including open decisionmaking and publication of decisions and the reasons for those decisions.
- Prohibiting conflicts of interest.
- Providing effective arrangements for appealing the agency’s decisions.
- Providing for scrutiny of the agency’s budget, usually by the legislature.

- Subjecting the regulator's conduct and efficiency to scrutiny by external auditors or other public watchdogs.
- Permitting the regulator's removal from office in cases of proven misconduct or incapacity.

Possible paths of transition

Resistance to independent agencies is breaking down. Ministers once adamant about maintaining political control over tariffs and other regulatory matters increasingly see the benefits of creating such agencies, which include improving offers from investors, helping to sustain reforms, and shifting responsibility for unpopular decisions to someone else. But what if the government resists? The choice can be stark. Governments can reduce discretion by adopting highly specific rules, forfeiting flexibility and other advantages. Or they can retain discretion, pay investors risk premiums, and accept higher tariffs, reduced proceeds from privatization, or both. In either case ministerial structures will usually make it difficult to develop expertise to deal with regulatory problems arising after privatization.

But several options lie between the traditional ministerial model and the delegation of broad discretionary authority to a fully independent agency. These options can form a path of transition to greater independence and delegation of discretionary authority. First, a dedicated regulatory unit can be created within a ministry to coordinate regulatory activity and foster the development of technical skills and professional norms. The autonomy of the unit can often be enhanced by placing it under the responsibility of a minister other than a sectoral minister—particularly important if there is potential for conflict between private firms and state enterprises under the purview of the sectoral minister. Once such a unit has been created, governments can increase the transparency of regulatory processes and approximate an independent agency in other ways. Exempting staff from civil service salary rules will usually be more problematic, but concerns about technical competence can be addressed by contracting out certain tasks to consultants.

Second, an agency can be created with many of the attributes of an independent agency, but with one or more ministers taking part in decisionmaking (as in Colombia). This approach can improve the technical quality of regulatory decisionmaking, particularly compared with the first option. But as long as ministers retain significant influence, the risk of misuse of regulatory discretion remains.

Third, a more truly independent agency can be created, but with some or all of its powers limited to making recommendations to the minister (as in Hungary). A variant is to give the agency decisionmaking authority but have appeals go to the minister rather than another independent authority (as in Argentina). This approach reinforces the separation of professional and political considerations in decisionmaking and usually provides the agency with greater insulation than under the second option. Political considerations are not excluded from the regulatory process, but the agency can build a reputation for professionalism and balanced judgment, enhancing its authority and reducing the likelihood of being overruled. Models can also be devised in which the minister is permitted to depart from the agency's recommendations or decisions only in narrowly defined circumstances.

Even where the minister has withdrawn from regulatory decisions, a transition strategy may still be appropriate. Delegating broad discretionary powers to an untested agency poses risks, particularly in countries with limited regulatory experience and capacity. The broader the agency's authority, the more enticing a target it will be for those with incentives to undermine its independence. And lack of detailed standards—like those that have taken more than a century to develop in the United States—can create uncertainty and risk for investors. The prudent course is to take the time to carefully define a new agency and ensure that it has access to adequate resources.

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Utility Regulators—Roles and Responsibilities

Warrick Smith

Creating independent regulatory agencies has become a key element of utility sector reforms around the world. As discussed in the preceding Note (pages 9 to 12), these agencies are intended to insulate decisionmaking from improper pressures and foster technical expertise. This Note focuses on how to define the responsibilities of such agencies, particularly in developing countries. It considers the scope of agencies' industry coverage, their role relative to ministers, and their role relative to other regulatory objectives and bodies.

Industry coverage

Specialist utility regulators can be organized along three main lines:

- Industry-specific, in which there is a separate agency for each industry—such as gas, power, water, and telecommunications—as in the United Kingdom.
- Sectorwide, in which there is an agency for each more broadly defined sector, such as the energy regulator in Colombia and the transport regulator in Canada.
- Multisector, in which there is a single agency for all or most utility industries, such as the state-level regulators in Brazil and the United States and the national regulators in Costa Rica and Jamaica.

Advantages of multi-industry agencies

Making an agency responsible for more than one industry offers several potential advantages.

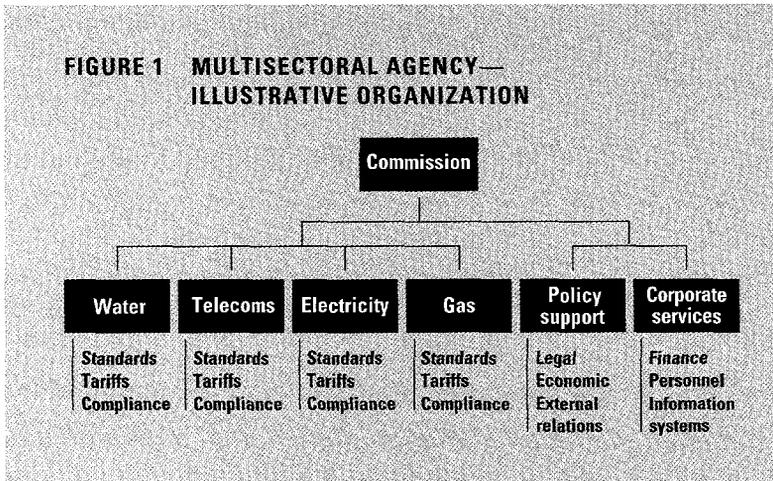
Sharing resources. Economists, financial analysts, and other professionals can work across industries, and administrative staff and facilities can be shared. This is particularly important in countries where regulatory expertise is scarce.

Facilitating learning across industries. All utility industries have unique features, but the main issues in their economic regulation are substantially the same: administering tariff adjustment rules, managing the introduction of competition into traditionally monopolistic industries, and managing relationships with stakeholders. Having a single agency aids the transfer of insights and experience between industries.

Reducing the risk of industry capture. A key challenge in utility regulation is to guard against the agency's capture by the regulated industry. If the industry and the regulator develop too close a relationship, the industry may be able to divert regulatory effort to promote its own interests rather than the public's. The broader responsibilities of a multi-industry agency help to reduce this risk.

Reducing the risk of political capture. Agencies intended to operate at arm's length from political authorities remain vulnerable to interference from them. Placing responsibility for several industries in one agency may make it a more attractive prize for political authorities. But there are two reasons a multi-industry agency might be exposed to less risk of political capture rather than more. First, the agency's broader constituency raises the stakes of political interference: interfering in a decision on, say, water tariffs will be seen as a threat to all industries regulated by the agency. Second, an agency responsible for more than one industry can develop greater independence from sectoral ministries. Political pressures are unlikely to have an effect unless they come from higher-level authorities, who can consider the repercussions of short-term actions from a broader perspective.

**FIGURE 1 MULTISECTORAL AGENCY—
ILLUSTRATIVE ORGANIZATION**



Reducing the risk of economic distortions. All industries compete for investment capital, and there is direct competition between some utility industries in meeting consumer needs, such as between gas and power or among different transport modes. Some regulatory issues are unique to specific industries and thus warrant different approaches. But many issues, such as the valuation of capital and the treatment of inflation, are common to all industries. Inconsistent approaches to these issues in competing industries can create economic distortions. Having a single agency makes it easier to adopt consistent approaches.

Dealing with blurred industry boundaries. Traditional boundaries between utility industries are rapidly blurring. Gas, power, water, and railway firms are entering telecommunications markets. Gas utilities are entering the power industry, and water and power utilities are merging. Such developments can pose important regulatory challenges. A firm involved in several industries may be able to exploit differences in the rules that apply to its activities in different industries. And regulatory decisions on one industry can affect other industries. Multi-industry agencies can deal with these challenges in a coordinated way.

Offsetting disadvantages?

Proponents of industry-specific agencies often argue that multi-industry agencies have weaknesses or limitations that offset their advantages. One concern is that a multi-industry agency may lack sufficient industry-specific expertise or focus. This concern can be ad-

ressed in several ways. Industry-specific departments can be created within the agency, but with a cross-sectoral decisionmaking body and cross-sectoral departments for pooling expertise and managing shared resources (figure 1). The agency can also draw on advice from industry-specific advisory groups.

A second concern is that placing responsibility for several industries in one agency is tantamount to “putting all your eggs in one basket”—the agency’s failure would have costs for all industries. Although industry-specific agencies help to diversify this risk, they do so at the expense of the strength of a single agency, increasing the risk of failure.

A third argument is that having a number of agencies allows experimentation with different approaches. However, industry-specific experiments are still possible in multi-industry agencies.

Finally, it is sometimes suggested that multi-industry agencies are appropriate only for very small economies. Certainly, the arguments for such agencies are especially strong in these cases. Yet California’s Public Utilities Commission is responsible for gas, power, water, transport, and telephony in an economy with a population of more than 30 million, a GDP and utilities that dwarf those of most countries, and no evident shortage of trained professionals.

Creating multi-industry agencies

The preferred approach to creating a multi-industry agency is usually to set it up as one from the outset, adding industries to its jurisdiction as they undergo reform. If an industry-specific agency already exists, it may be possible to expand its mandate to cover additional industries.

The alternative strategy—creating a series of industry-specific agencies and later merging them—has disadvantages. It delays such benefits of a multi-industry agency as fostering learning between industries, which are particularly important during an agency’s early years. And the obstacles to later merger should not

be underestimated. Industry-specific regulators will have incentives to resist merger, not least because of the implications for their jobs. Regulated firms may also resist, often out of concern that they will have less influence over a multi-industry agency. Thus mergers usually require substantial political will and effort.

The main challenge in creating multi-industry agencies is to ensure an effective coordinating mechanism during their design and establishment. Because advisers with industry-specific responsibilities have little incentive to propose multi-industry approaches, leadership usually must come from a central ministry.

Role relative to ministers

One of the most sensitive relationships for a regulatory agency is that with the relevant ministers and their ministries. It is sometimes suggested that the ministry is responsible for policy and the agency for regulation. But this distinction is unhelpful in practice, because the dividing line between the concepts is fuzzy at best, and agencies with significant discretion clearly have a policy role.

Four main considerations generally determine the allocation of responsibilities between agencies and ministries. The first is whether the matter in question is judged to be appropriate for decision on political or technical criteria. Such judgments can change over time. For example, while political control over tariffs was once considered the norm, there is now growing recognition that, once the key policy principles or rules are established, society's interests are best served by delegating responsibility to an independent agency. Tax and subsidy issues, by contrast, are still widely regarded as the province of political rather than independent bodies.

The second consideration is whether collocation of particular functions could create significant conflicts of interest. For example, responsibility for actively promoting investment in a sector often conflicts with a regulatory agency's role as an impartial arbiter of investor and consumer interests, as well as dilutes its focus.

The third consideration is which body has the expertise for a task and whether having related tasks performed by the same body yields any economies. Once created, an agency usually becomes the main repository of public sector expertise on the industries it regulates. If the ministry is subject to restrictive civil service salary rules and the agency is not, the ministry may find it difficult to maintain expertise. This often justifies giving the agency an advisory role on matters remaining under ministerial control.

The fourth consideration is the degree of confidence political authorities have in the agency. Agencies tend to be given greater authority once they have proved their reliability.

Based on these considerations, there is general consensus that ministers should retain responsibility for broad sector policy, including public investment, privatization, sector restructuring, taxation, subsidies, intergovernmental relations, and the legislative framework. But even in these areas, agencies may be given advisory roles.

There is less consensus on where responsibility for granting licenses or concessions should lie. Much depends on the criteria governing the award of licenses: the more objective and technical are the criteria, the stronger is the case for delegating the responsibility to an agency.

Most systems give agencies responsibility for administering tariff adjustment rules, elaborating detailed standards, monitoring compliance with norms, and facilitating the settlement of disputes. In some systems the power to impose sanctions for noncompliance with norms is reserved for the courts. In most, however, the agency performs this role, although major sanctions—such as cancellation of licenses—may require a ministerial decision.

Role relative to other regulators

Utility regulators' main focus is economic regulation of firms with monopoly power. But utilities, like other firms, are subject to regulation to meet a raft of other objectives, including safety,

antitrust, and environmental aims. How should a utility regulator's role be defined in relation to these objectives and to other regulators?

A sound general rule is to avoid a proliferation of agencies. Creating numerous agencies can dissipate expertise, forgo the economies in having one entity perform related tasks, create coordination demands, and introduce additional complexity. But as with most general rules, there are exceptions. Separate agencies may be required to avoid significant conflicts in the mandate of a single agency. When an existing agency responsible for, say, environmental regulation is performing well, immediately transferring its responsibilities in utilities to a new utility regulator is usually inadvisable. And there are inescapable tradeoffs between cultivating expertise, economies of scale, and coordination in utility regulation and doing the same in environmental or other regulation for the economy as a whole.

There is one rule that should have no exceptions: If more than one agency is involved in regulating utilities, the role of each should be defined as clearly as possible to avoid duplication, jurisdictional uncertainty, and turf disputes.

Service quality issues

Customer service standards are usually the province of the utility regulator. But the allocation of responsibility for safety and environmental regulation can vary widely, even between sectors in a single country. Two main issues warrant consideration.

Standard setting. Quality standards have a direct impact on utilities' costs and thus on prices. If the utility regulator is not responsible for determining standards, it may have a role in providing advice to the agency that is responsible.

Tariff adjustment. Because changes in quality standards affect costs, they may require tariff adjustments. When different agencies are responsible for regulating tariff and quality parameters, coordination issues can arise. These

issues can be addressed in several ways, including through tariff rules that permit certain cost increases to be passed on automatically.

Antitrust matters

Antitrust regulation includes prohibitions on certain anticompetitive agreements and mergers and on the misuse of market power. In countries with modern antitrust regimes, these matters are usually entrusted to a specialist agency with economywide jurisdiction. How should a specialist utility regulator's role be defined relative to the antitrust agency? There are two main issues.

Clarifying the interaction between regimes.

There may be overlap between utility and antitrust regulation in some areas—for example, between industry-specific regimes governing access to networks and economywide rules governing the misuse of market power. The interaction between the two regimes should be defined clearly from the outset.

Exploiting complementary expertise. Utility regulators and antitrust agencies have complementary expertise. Both agencies may be involved in reviewing proposed mergers or allegations of anticompetitive conduct in utility industries. In some cases a member of the antitrust agency is also made a member of the utility agency, or the agencies make formal submissions to proceedings conducted by the other. Antitrust agencies may also be given special roles in utility regulation, such as hearing appeals of decisions by the utility regulator.

Decisions on the responsibilities of a utility regulator have important implications for other aspects of the agency's design, including its decisionmaking structure, its resources, and the start-up strategy. These and related issues are considered in the next Note (pages 17 to 20).

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Utility Regulators—Decisionmaking Structures, Resources, and Start-up Strategy

Warrick Smith

Governments creating specialized regulatory agencies must make decisions on a wide range of issues. Questions relating to the independence and responsibilities of such agencies are considered in the two preceding Notes (pages 9 to 16). This Note focuses on a third set of issues related to decisionmaking structures, resources, and start-up strategy. Like the other two Notes, it focuses on the situation in developing countries.

Decisionmaking structure

The design of an agency's decisionmaking structure encompasses issues relating to the number of decisionmakers, the basis for selecting them, the roles accorded to stakeholders, and the regulatory and appeals processes.

Number of decisionmakers

Many countries entrust decisionmaking authority to a commission or board of three to five members; others prefer a single individual. Each approach has its strengths and weaknesses, and the choice often depends on a country's traditions and conditions (table 1). Agencies responsible for several industries usually choose a commission.

Selection of regulators

When agencies are to be independent, the goal should be to select regulators with the personal qualities needed to exercise independent judgment and resist improper pressures or inducements. The selection is critical, particularly for new agencies that have yet to establish a reputation for competence and reliability.

Qualifications and disqualifications for appointment are usually set out in the law establish-

ing the agency. Disqualifying factors generally include having a financial interest in regulated firms, which creates a conflict of interest and, in some countries, being related to the president or ministers. A common qualification required is significant experience or training in economics, finance, law, public administration, or industry.

It is sometimes suggested that some or all appointees should have industry-specific technical expertise or long experience in the regulated industry. But this requirement is unnecessary and in some cases undesirable. It is unnecessary because such technical expertise will be available from agency staff or consultants. It is

TABLE 1 DECISIONMAKING STRUCTURES—INDIVIDUAL VERSUS COMMISSION
Strengths and weaknesses

Characteristic	Individual	Commission
Speed of decisionmaking	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Accountability for decisions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Resource demands	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Predictability of decisions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Invulnerability to individual preoccupations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Invulnerability to improper influences	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Potential to reflect multiple perspectives	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Potential to stagger terms to enhance stability and weaken links with particular administrations	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note: The ✓ indicates which structure is stronger on each characteristic.

undesirable if it ends up excluding professionals with broader perspectives relevant to economic regulation or if it unduly restricts the pool of candidates. It is particularly inappropriate for multi-industry regulators, because requiring that expertise in each industry be represented on the commission could crowd out appointees with broader perspectives. It could also result in the expert for each industry becoming the de facto regulator for that industry, losing the potential benefits of a commission approach.

Another view is that the decisionmaking body should be composed of representatives of consumers and regulated firms rather than technical experts. Although it is important for stakeholders to participate in the regulatory process, for several reasons including them on the decisionmaking body is inadvisable:

- In most industries it is not feasible to identify single representatives of consumers and the industry. Residential, industrial, and rural consumers have different and sometimes conflicting interests, and interests are likely to vary within these groups across regions or income classes. Regulated firms can also have different and sometimes conflicting interests in regulatory decisions. So, a representative approach can result in pressures to create very large decisionmaking bodies, which would increase delays and reduce individual accountability.
- Decisions of representative bodies hinge on their composition and voting rules. If the composition and voting rules favor one interest over another, decisions can be expected to be biased accordingly. If the interests of consumers and utilities are equally balanced, and the deciding vote is left to a representative of the government, short-term political considerations can be expected to dominate regulatory decisionmaking.
- Representative bodies internalize bargaining and the exchange of concessions between interests at the expense of a more open and transparent evaluation of competing social interests.

The executive branch usually plays the dominant role in the appointment process, but the

legislature often also has a role, such as in confirming appointments. Involving both branches of government is especially important in systems in which the executive does not necessarily control the legislature; it provides a check against partisan appointments and helps to legitimize regulators' authority.

Role of stakeholders

To ensure that a regulatory agency makes decisions that are well informed and accepted as fair and legitimate, consumers, regulated firms, and other stakeholders must have the opportunity to present their views. For the reasons noted above, their participation in the decisionmaking body is inadvisable. But there are several other options.

Open regulatory processes. Those with a significant interest in a regulatory decision are usually permitted to present their views to the agency before the decision is made. In the United States the process for doing so is usually formal hearings, often criticized for being too legalistic, costly, and slow. Regulators in the United Kingdom initially adopted much more informal processes, but the trend now is toward greater formality. Countries such as Argentina and Bolivia are experimenting with open processes that more closely reflect local traditions.

Consultative or advisory bodies. Some countries have created special consultative or advisory bodies, usually organized on an industry-specific basis, to advise the regulator and other public authorities. These bodies are usually part-time and composed of representatives of consumers, utilities, and industry experts. Special consumer councils can be especially important in countries that lack effective advocacy of consumer interests.

Regulatory process

Decisionmaking processes range from formal hearings, as in the United States, to more informal processes, such as those in the United Kingdom. Wherever the balance is struck, the

focus should be on transparency in decision-making, which reduces opportunities for improper influences and underscores the fairness and legitimacy of decisions.

The regulatory process usually involves three main steps: providing people who have an interest in a decision with an opportunity to present their views, publishing the decision and the detailed reasons for reaching that decision, and giving stakeholders an opportunity to challenge the decision through an appeals process.

The appeals process is important to ensure that the regulator does not stray from its mandate and that it remains accountable. Two closely related issues need to be considered in designing an appeals process.

Appellate body. If the regulatory agency is to be independent, the appellate body should also be independent. In most countries appeals of regulatory decisions go straight to the courts. But in some countries there is an intermediate step in which appeals go to a body that is expected to have more technical expertise than the courts and that may also be able to respond more quickly. In the United Kingdom, for example, the antitrust agency hears appeals relating to license amendments. In Bolivia a special superintendency hears appeals from sector regulators.

Grounds of appeal. The grounds of appeal are usually limited to errors of fact or of law, including failure to follow a required process. Appellate bodies are generally not permitted to reconsider the merits of the decision and substitute their own judgment.

Resources

An agency's effectiveness is determined largely by the adequacy of its resources, both human and financial.

Human resources

Utility regulation requires personnel with a mix of skills in such fields as economics, finance,

law, and engineering, and with the character and integrity to resist improper pressures and inducements. People with these attributes are scarce in many reforming countries, and those who have them will often receive attractive job offers from privatized utilities. Thus attracting and retaining well-qualified staff often requires exempting agency staff from restrictive civil service salary rules.

There is no magic formula for determining the number of staff required by an agency. It all depends on the agency's responsibilities, the climate in which it must discharge those responsibilities, and its strategies for performing those tasks. In the United States staff size ranges from less than 40 in the public utilities commissions responsible for multiple industries in the smaller states to more than 1,000 in the Federal Energy Regulatory Commission. As a general proposition, "small is beautiful." Overstaffing can dilute an agency's professional focus and increase the direct costs of regulation. It can also increase the indirect costs of regulation if staff make unnecessary demands on utilities to justify their jobs. For these reasons a sound general principle is to keep the permanent agency staff as small as possible, engaging consultants to assist with specialized tasks.

Regulatory agencies increasingly contract out tasks to private firms or consultants, such as the analytical work underpinning tariff adjustments and similar decisions and the compliance audits of regulated firms. But the agency must retain—and be seen to retain—responsibility for its decisions, to avoid undermining the legitimacy of its actions. It must also ensure that the contractor is not subject to improper influences or inducements from regulated firms or other sources.

Financial resources

Regulatory tasks, like other government functions, were traditionally funded from general tax revenues. Now most regulatory agencies obtain their income from levies on consumers. These levies can be charged to consumers directly but are more often collected indirectly by imposing

a levy or license fee on regulated firms and allowing them to pass the cost on to consumers through tariffs. In OECD countries this approach is usually seen as part of a cost recovery strategy: it reduces demands on general tax revenue and imposes the financial costs of regulation on the primary beneficiaries (consumers). In many developing and transition economies, by contrast, earmarked funding is often viewed primarily as a means of ensuring that agencies have a reliable source of income and thus as a safeguard of agency independence.

To prevent levies from becoming too burdensome, the law establishing the agency usually sets a cap on levies, often defined by reference to industry turnover or some other indicator. The cap is 0.5 percent for telecommunications regulators in Argentina, Peru, and Venezuela; 1.0 percent for the energy regulator in Colombia; and 2.0 percent for the water regulator in Peru. The cap establishes the maximum levy; actual levies are set each year to cover a budget approved by the legislature. When an agency is responsible for more than one industry, a different levy is usually set for each industry that covers the costs of its regulation and contributes to costs shared across industries.

Start-up strategy

Utility regulators should be established as long before privatization as possible, even if their formal powers do not go into effect immediately. This gives regulators time to familiarize themselves with their new responsibilities, to establish their offices, and to undertake any necessary training. It also provides assurance to consumers that their interests will be protected after privatization and gives potential investors an opportunity to assess the regulatory system before formulating proposals.

Most new regulatory agencies can expect a challenging infancy. Besides mastering complex technical issues, regulators must define new and often difficult working relationships with political authorities, regulated firms, consumers, and other stakeholders. In countries

where the requisite skills are scarce, regulatory experience is limited, and there is little tradition of independent public institutions, the challenges can be daunting. And life is not made easier for a regulator if privatization remains politically contentious and if the first public evidence of its effects is a price increase allowed by the regulator.

To meet these challenges, regulators must have adequate training—not only in such traditional disciplines as law, finance, and economics but also in negotiation analysis, media relations, and the like. Regulators may also need technical support during their first months in office. Such support is often provided by consultants acting to some degree as “shadow” regulators.

No less important, newly appointed regulators benefit from contacts and exchanges with more experienced regulators from other countries. Some of these contacts occur on an ad hoc basis, through visits and participation in conferences. But there is also an encouraging trend toward systematizing such contacts—for example, through a “twinning” arrangement between a new regulator and a more experienced foreign regulator. These arrangements can provide a basis for exchanging staff and materials or providing other forms of support and advice. There has also been a recent trend toward creating “networks” of regulators, such as the International Forum for Utility Regulation sponsored by the World Bank.¹

¹ For more information on the International Forum for Utility Regulation: telephone 202 473 6566; fax 202 522 2029; email IFUR@worldbank.org.

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Utility Regulation—A Critical Path for Revising Price Controls

Richard Green

Many countries are privatizing their infrastructure sectors, setting up independent regulatory agencies, and devising price rules and transparent price adjustment processes for regulators to ensure that newly private firms do not abuse their monopoly powers. The United Kingdom was one of the first countries to privatize its utilities, selling off British Telecom in 1984, British Gas in 1986, the water industry in 1989, and the electricity industry in 1990. The United Kingdom also pioneered the use of price control regulation. At the core of this regulatory mechanism is the periodic (usually five years) review of price controls, which the U.K. experience shows is complex, time-consuming, and often controversial. Based on the U.K. experience, this Note proposes a sequence of tasks for regulators in other countries to use when revising their price controls.

In the mid-1980s some commentators thought that price controls were fundamentally different from rate-of-return regulation, the more traditional approach used in the United States. Most would now agree that the two belong to the same family of instruments, with both requiring a similar process and similar calculations.

Under rate-of-return regulation the regulator allows the company to charge the prices expected to produce profits equal to a fair rate of return on the fair value of capital invested in the company. If profits fall below this level, the company can request approval for a new set of prices. The problem with this approach is that it gives the firm little incentive to improve efficiency and may even encourage behavior that will raise costs. Under price controls prices are set so as to allow the firm to generate sufficient revenue to cover its costs, less an amount reflecting the efficiency gains the regulator considers achievable. The firm has an incentive to make those gains, because otherwise it will incur a loss. But it also has an incentive to exceed the gains, because it is free to keep any additional

BOX 1 A MANUAL FOR REGULATORS

The World Bank's Economic Development Institute will soon publish a manual for economic regulators, *Resetting Price Controls for Privatized Utilities*, that describes the tasks they should undertake when revising the price control for a regulated company. Besides setting out a critical path for price control review, the manual presents options for price control; sets out a formula for calculating the amount of revenue that would be appropriate under a price control, including an option using cost pass-through; explains how to carry out present-value calculations to determine how much revenue would be required to cover a company's predicted costs and a specified cost of capital; shows how to apply yardstick competition to test the validity of a firm's cost projections; and details the issues surrounding the choice of asset value and depreciation rates. The manual, written by Richard Green and Martin Rodriguez-Pardina, will be available from Antonio Estache (aestache@worldbank.org).

profits it can earn during the control period. At the end of the period, though, the regulator adjusts the prices, passing on the benefits of the efficiency gains to consumers through lower prices. The regulator then sets a new control.

Thus under rate-of-return regulation the regulator is expected to raise prices whenever the company's revenue requirements rise, while a price control is intended to last for a preset period, regardless of what happens to the company's costs. Price control regulation gives the company a greater incentive for efficiency but also exposes it to more risk. If the company's ability to bear risk is limited, it may be best to have a short period between price reviews, effectively adopting rate-of-return regulation. If the company can bear more risk and is believed to have much scope for reducing its costs as long as it is given an incentive to do so, it is better to have longer periods between reviews—a "purer" form of price control regulation.

Timetable for revising price controls

The regulator should start to reset the control at least two years before a new one is due to come into effect. Much information will be required, and it will all have to be checked and processed before the regulator can propose a new control. In addition, most regulatory systems include an appeal mechanism to protect the company against an overzealous regulator, so the regulator will have to allow time for a possible appeal. These considerations imply that the regulator should make his proposal at least nine months before the control is due to take effect, to allow six months for an appeal and time to implement the eventual decision (figure 1).

Gathering and analyzing information

The regulator should start by asking the company for information on its present and projected operating costs, its assets, its investment plans, and its demand forecasts. Some of this information may have to be specially produced, so the company must be given adequate time

to respond. Once the regulator has the information, it must be assessed. Every regulated firm knows that its allowed revenues will depend on its predicted costs and investment and thus has an incentive to inflate these predictions. And it has an incentive to underestimate demand: the lower is the predicted demand, the higher are the prices needed to raise a given amount of revenue.

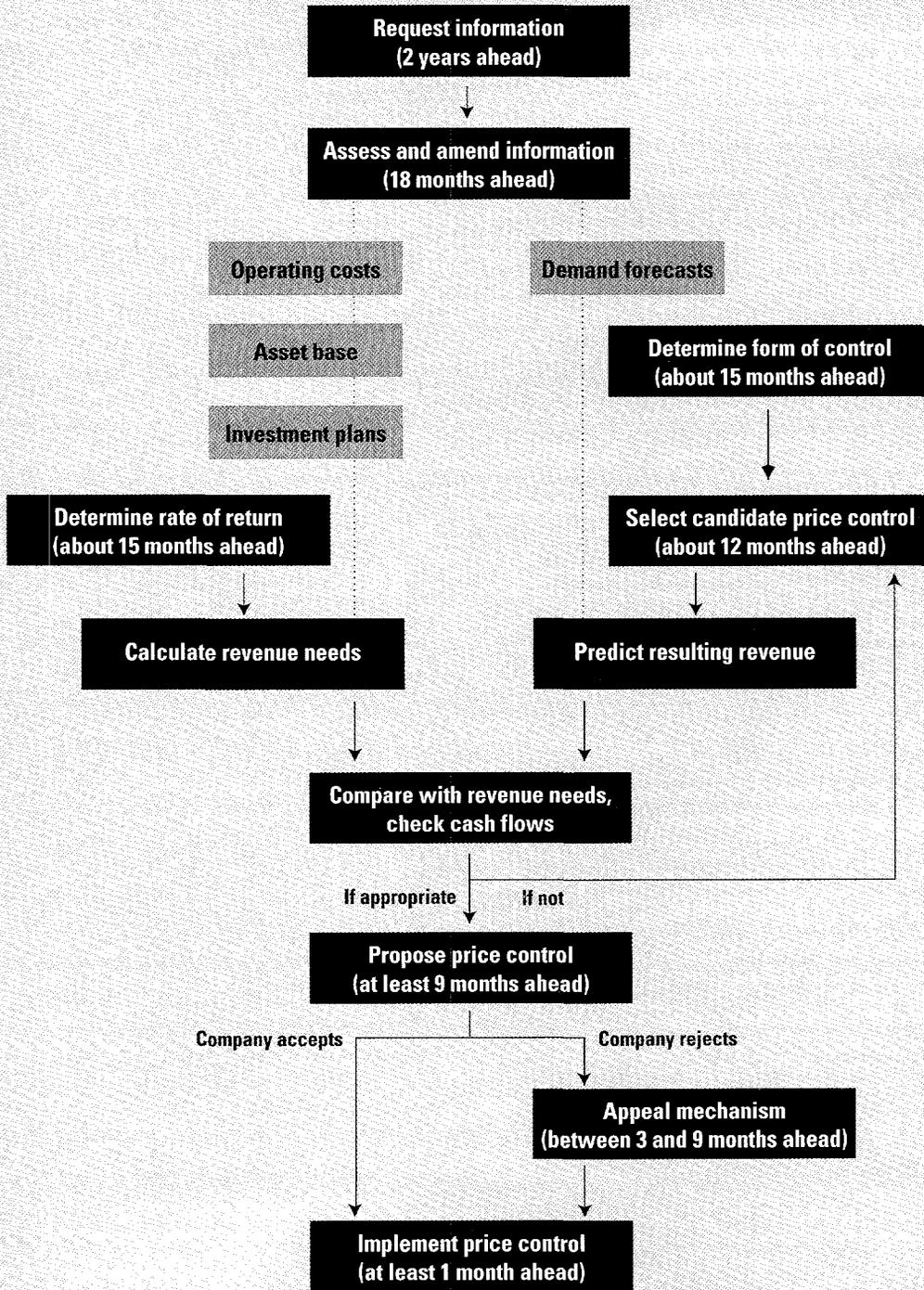
At the very least, the data should be consistent—if the company plans to invest a lot to meet new demand, the demand forecast should reflect this—and the regulator should check that the company is not predicting excessive operating costs or investment. Specialists (in-house or consultants) will probably have to be employed to assess at least some of the company's investment plans. But the company's operating costs can be compared with those of similar companies—a process known as yardstick competition.

Forecasting revenue requirements

Once the regulator has adequate data on the company's costs, they can be combined to forecast the company's revenue requirements. These will be equal to operating costs plus depreciation plus a return on assets (both existing assets and new investment). Revenue requirements can also be expressed as operating costs plus investment plus the change in the present value of the company's assets over the period. The two approaches may sound different, but they give the same answer.

Critical in determining the revenue needed is the rate of return used—the amount that must be paid to reward investors for the use of capital. One way to estimate the rate of return is to base it on stock market information. Equity should earn the normal rate of return for the country, plus a risk premium related to the company's riskiness relative to the market. Debt should earn a return related to the company's credit rating. If the local stock market is not well developed, it may be possible to use information from markets in other countries.

FIGURE 1 A CRITICAL PATH FOR A PRICE CONTROL REVIEW



Key: information flows actions

Choosing the form of control

The regulator must also determine the form of price control to use, unless it is specified by law (U.K. regulators face no constraints on the form of control other than the need to get it past the Mergers and Monopolies Commission if appealed). The two main types of control are price basket and revenue yield (see page 26). A price basket control sets weights for a number of prices and controls their weighted average. With a revenue yield control there is no need to set individual prices, and the weights are effectively the current quantities sold by the company. The price basket can lead to more efficient relative prices but is suitable only for a company with a small and relatively stable set of prices. The revenue yield approach is better for a company with more complicated prices, though it may give the firm an incentive to expand sales in low-priced services.

The regulator must then decide whether to exclude some sales from the control—because, say, they are subject to competition, as sales to large consumers can be. The regulator must also decide whether to allow the company to pass some costs straight through to consumers rather than including them (at their projected level) in the control. Such cost pass-through can reduce the risk borne by the company in the face of fluctuating prices for inputs.

Checking revenue and cash flows and making the announcement

Given the form of control (and the demand forecasts), the regulator can estimate the revenue that would be produced under different values for its parameters. Once the regulator has chosen a set of parameters that appear to yield appropriate revenue, he should also project the company's cash flows to ensure that these too are adequate. When the regulator is satisfied with the control, he can announce it as a formal proposal.

Because the new price control could affect the regulated company's profits, the announcement

may cause ripples in the market. So, rather than make a single public announcement, the regulator might release information regularly during the review. That allows the regulator to discuss options with interested parties before finalizing the proposal, reducing the risk and impact of leaks. It can also have political advantages: giving people time to get used to proposals before they become formal may defuse controversy.

If the company accepts the proposed control, the regulator can implement it formally. If not, the appeal mechanism should be invoked so that an independent body can determine the appropriate level for the control. The regulator and the company should already have prepared most information needed for the appeal process, but it could still take up to six months. Once the appeal process is finished, the regulator will need time to formally implement the proposal and the company will need time to set prices consistent with the control—perhaps up to two months. Since the company must also be given time to decide whether to appeal, the regulator clearly must announce the proposed control at least nine months before it is due to take effect.

Conclusion

The aim of regulation is to protect consumers while ensuring that the company remains viable and has an incentive to operate efficiently. The term *price control* does not imply that the regulator dictates every price that the company charges. Instead, a price control is a constraint on the overall level of the company's prices. As long as the company complies with this constraint, it is free to choose its prices, and it has every incentive to act as efficiently as possible. The regulator must ensure that the constraint is not too harsh, for the company must remain viable. But if it is too loose, consumers will pay higher prices than necessary.

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Has Price Cap Regulation of U.K. Utilities Been a Success?

Richard Green

Developing the approach—a proposal for British Telecom

The privatization of British Telecom (BT) in 1984 reintroduced the regulation of private infrastructure companies in the United Kingdom, after nearly forty years of public ownership. Two regulatory approaches were initially proposed: controlling BT's prices by setting a maximum rate of return and imposing an output-related profits levy on BT at a rate that would fall as the company's output rose, giving it an incentive to keep output high and prices low.

Professor Stephen Littlechild, who later became the first regulator of the electricity industry, was asked to choose between the two schemes. But instead he proposed a third, a price cap system that the government adopted. Littlechild argued that a maximum rate of return would limit BT's incentives to operate efficiently, while the effect of an output-related profits levy remained uncertain. Expecting increased competition in telecommunications, he pointed out that if BT faced a levy that its competitors did not, it could be at a significant disadvantage.

Littlechild proposed an explicit limit on the prices that BT could charge in the areas where it was expected to retain some monopoly power—line rentals and local call charges. The weighted average of a basket of these charges should fall in real terms by a specified amount each year. This was equivalent to saying that the charges should not increase by more than $RPI - X$, where RPI is the increase in the retail price index (a standard measure of general inflation in the United Kingdom) and X is the real reduction in prices. Littlechild argued that

this scheme would concentrate consumer protection where it was most needed while giving BT some freedom to change the balance of its prices. The scheme would be simple for the regulator to monitor, and it would minimize the risk of regulatory capture because it would be nondiscretionary. Above all, Littlechild hoped that the scheme would be temporary, for competition is by far the most effective means of protection against monopoly. He therefore recommended that the scheme be adopted for five years, and reviewed after four.

A price cap for British Gas

A second price cap was adopted for British Gas when it was privatized in 1986. This price cap is based not on individual prices but on the average revenue yield from sales to small consumers—the value of sales divided by the volume of gas sold. This formula gives the company more freedom to introduce new tariffs, since there are no controls on individual prices and no need to worry about the weights in a basket. (See tables 1 and 2 for a comparison of the two types of price controls and traditional rate-of-return regulation.)

A second change is the pass-through of the cost of gas purchases to consumers so that they, not British Gas, bear the risk of changes in the wholesale gas price. This price is outside British Gas's control but accounts for nearly half its costs. The formula became known as $RPI - X + Y$; X denotes the expected productivity increase (2 percent a year), and Y the pass-through of the cost of gas. In the years after privatization the cost of gas fell significantly, and the benefits were passed straight on to consumers.

TABLE 1 FORMULAS FOR PRICE BASKET, REVENUE, AND RATE-OF-RETURN CAPS

Method	Formula
Price basket cap	Prices \times quantity weights (set by regulator) $<$ cap
Revenue cap	Revenues $<$ actual output \times price weights (set by regulator)
Rate-of-return cap	Proposed tariff \times predicted output $<$ predicted costs + fair profit

TABLE 2 KEY FEATURES OF PRICE BASKET, REVENUE, AND RATE-OF-RETURN CAPS

Feature	Price basket cap	Revenue cap	Rate-of-return cap
Constraint set by cap	Weighted average of prices cannot exceed cap	Revenues cannot exceed limit (related to output) set by cap	Tariff cannot predict a rate of return above regulated level
Coverage	Specified prices (line rentals, domestic calls)	Specified types of sales (such as to captive small consumers)	Regulated business's predicted revenues
Implementation requirement	A list of prices	Output measures	Tariffs that give revenue predictions
Weights on quantities	Set by regulator	Actual quantities	Predicted quantities
Price weights in cap	None explicit	Set by regulator	From tariff
Constraint on cross-subsidy tariff	Subsidiary cap required	Separate constraint required	Regulator could disallow
Opportunity for manipulation	Very small	Some (likely to be small in practice)	Some (likely to be small in practice)
Cost pass-through terms	Might be included in cap (difficult)	Simple to include in cap	Tariff might contain escalation clause
Correction factor	Not required	Required	Not required
Advantage	Simple to define and monitor	Allows constraint to respond to actual output and pass-through costs	Investors face lower risk, reducing cost of capital
Limitation	Needs a full list of prices	Needs homogeneous output measures (revenues must be $<$ output \times weight)	Needs predictions of revenues and costs for each new set of tariffs
Example	British Telecom	British Gas	U.S. utilities

A price cap for water

Littlechild was consulted again when the water industry was prepared for privatization, in 1986. The industry was required to complete a large backlog of investments, and prices were expected to rise to finance them. Once again, Littlechild recommended a control on prices rather than profits, although it was clear that direct competition between water companies

was practically impossible and a permanent control would be needed. Indirect competition in the form of yardstick regulation (advocated by Shleifer 1985) was possible, however, and Littlechild recommended using comparisons between companies when setting and resetting price controls. Because prices were expected to rise, the scheme became known as $RPI + K$, although it was really $RPI - X + Q$, where Q is the cost of investment to meet quality targets.

Revision of the first price control

In 1988 it became clear that BT did not face enough competition to abolish the price control, so the regulator proposed a new control. For the first five years BT had faced a control of $RPI - 3$ on line rentals and directly dialed domestic calls, and a subsidiary price control that limited any increase in line rentals to 2 percent a year in real terms.¹ The regulator proposed a new control, $RPI - 4.5$, which would also bring some operator services into the basket of controlled prices.

The regulator gave little information on this decision at the time but later explained how the new value of X had been chosen. His staff had built a financial model of BT (in consultation with the company) so that they could predict BT's profits and rate of return on capital, given a value of X . In 1988 BT earned more than its perceived cost of capital, so the regulator chose a value of X predicted to eliminate the excess return by the end of the price control period (set at four years). This approach has much in common with the calculations used in rate-of-return regulation, although the fixed review period and the regulator's ability to disregard excessive costs give the company a greater incentive to be efficient and force it to bear more risks. BT accepted this control; if the company had rejected it, the issue would have been decided by the Monopolies and Mergers Commission (MMC), the United Kingdom's competition tribunal.

A check on the regulator's discretion

The Telecommunications Act of 1984, which set up the system of regulation, gave the Monopolies and Mergers Commission the role of "court of appeal," acknowledging the need for a check on the regulator's discretion. The commission has had to rule on six price cap disputes since 1992. These rulings have gradually built up some case law, for while each case is decided individually, the commission has recognized the value of developing a consistent methodology. Not wanting companies to ap-

peal their proposals, regulators have increased the amount of information they release and generally argue that they follow the "MMC methodology." If a company knows that the commission is likely to use the same methodology as the regulator, it also knows that it has little to gain from an appeal. The commission's role has brought a welcome increase in transparency in the resetting of price controls.

One-time reductions

When the early price controls were reset, only the value of X was changed, so prices stayed on a smooth path. But in 1994 Littlechild faced different needs in resetting the price controls for the distribution businesses owned by the twelve regional electricity companies in England and Wales. These companies, given $RPI + X$ price controls when they were privatized in 1990, had subsequently earned high profits, so a large reduction in prices was clearly required. But if only the value of X was to be changed, Littlechild faced a difficult choice. If he set X so that prices reached the "correct" level at the end of the period, the companies would continue to earn high profits for several years, an excessive reward for their earlier cost reductions.

The alternative was to set prices so that the companies would receive an appropriate amount of revenue over the period as a whole. If the prices declined evenly from the present level, however, they would have to fall well below their long-term level to bring down total revenue, creating future problems. Littlechild therefore decided to implement a one-time cut in prices followed by a control of $RPI - 2$, in order to combine an acceptable total revenue with a sensible price level at the end of the period. Similar one-time cuts have since been made in the price controls of British Gas Transco (gas transmission and distribution) and the National Grid Company (electricity transmission).

An assessment

Price controls in the United Kingdom have been controversial. The initial price controls for the

electricity and water companies, based on underestimates of the companies' scope for reducing costs, turned out to be overly generous, allowing them high profits. The 1994 review of the electricity price controls promised to reduce the companies' revenue by more than a sixth over the period, which Littlechild thought would give them no more than an adequate return. But Northern Electric, threatened with a takeover, was still able to promise to make a one-time payment to shareholders in cash and shares valued at twice the price for which it had been sold four years earlier and to increase future dividends. This caused a major political row, and Littlechild decided to reopen the review in March 1995.² Three months later he announced additional price cuts of about 10 percent, supported largely by a different treatment of the companies' asset values at flotation. Even these reductions were less than some people had expected, and share prices later rose, partly because of takeover bids. Littlechild received heavy criticism for his handling of the situation.

Following these events, some commentators (such as Burns, Turvey, and Weyman-Jones 1995) suggested forms of profit sharing regulation. Under such schemes the regulator would continue to set a price control for several years at a time, but would also monitor the company's costs and profits from year to year. If profits rose above a trigger level, the company would have to lower its prices, returning some of the "excess" profits to consumers. These suggestions have gained political support, and some regulators have considered implementing them, though they have not yet done so. The practical problem is that profit sharing would require audited cost information every year for calculating the allowable prices, and obtaining this information would place a heavy burden on both firms and regulators. Profit sharing would also weaken companies' incentives to lower costs.³

Although the utilities remain unpopular in the United Kingdom, most regulatory experts would be willing to defend the price control

system as one that gives companies an incentive to cut costs and returns the gains to consumers after a short time. The high profits of the early 1990s were due largely to unanticipated, one-time productivity gains following privatization that are unlikely to be repeated. The established method for resetting price controls makes further "mistakes" unlikely. In the future price controls can be expected to give companies an incentive for efficiency without allowing them to earn excessive profits.

¹ Like many other telecommunications companies, BT had set line rentals below cost and call charges above cost. To prepare for competition, the company needed to rebalance its prices, raising rentals and reducing call charges, but that would increase the bills paid by small consumers, who made relatively few calls. The RPI + 2 constraint was imposed for political reasons, to limit the speed of these increases.

² It had been generally assumed that the controls were finalized, but because a final stage of formal consultation remained before they could be implemented, Littlechild was legally allowed to change his proposals.

³ It has been suggested that the interval between main reviews could be lengthened, to restore incentives. But by the end of the period, prices (even after profit sharing) could diverge just as far from costs as they would under a pure price cap and a shorter review period, negating the main advantage claimed for profit sharing.

References

- Burns, P., R. Turvey, and T.G. Weyman-Jones. 1995. "Sliding Scale Regulation of Monopoly Enterprises." Discussion Paper 11. Centre for the Study of Regulated Industries, London.
- Littlechild, Stephen. 1983. *Regulation of British Telecommunications' Profitability*. London: HMSO.
- Shleifer, Andrei. 1985. "A Theory of Yardstick Competition." *Rand Journal of Economics* 16(3): 319-27.

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Network Industries, Incentive Regulation, and Profit Sharing

Peter Vass

Periodic price controls on network industries such as power, telecommunications, and water offer several advantages: they establish a type of profit sharing system and strike a good balance between incentives to perform and equitable distribution of performance gains between consumers and shareholders. Yet critics of the system in the United Kingdom, concerned about the large profits generated by newly privatized utilities, have proposed annual formula profit sharing schemes. Such schemes, however, would endanger firms' incentives to improve efficiency and could lead to higher costs and higher prices for consumers. Better alternatives to address public concerns are available.

Incentive regulation through price controls uses the possibility that regulated companies can earn profits beyond the normal rate of return required to meet their cost of capital and so creates incentives for greater efficiency. But the high profits of some privatized firms have created public controversy. In response, in June 1997 the United Kingdom's new Labor government announced plans for a comprehensive review of the regulation of privatized network industries and utilities. While saying that it was still committed to incentive regulation through periodic price controls rather than the U.S.-style annual profit control based on rate-of-return regulation, it indicated that it would consider adopting profit sharing schemes. The government's statement suggests that the current arrangements are not profit sharing and reinforces the widely held view that many of the profits that regulated industries have earned since privatization are illegitimate and reflect abuse of monopoly power.

But the United Kingdom's current system of periodic price controls based on $RPI - X$ is a profit sharing mechanism (where X is the efficiency gain the regulator considers achievable). The regulator sets maximum allowed prices for a company, which gives it an incentive to exceed X . That results in economic profit, and share-

holders clearly gain.¹ But consumers also gain, because by earning higher profits, the company reveals its improved performance to the regulator. The regulator can take that improved performance into account at the next periodic review, passing the benefits from that point on to consumers through prices lower than they would have been without the strong efficiency

The quid pro quo for lower prices tomorrow is higher profits today. But most of the profits go to customers—as long as regulators immediately pass the benefits on as lower prices at the next review.

incentive. The consumers' gain provides a strong rationale for the profit incentive in public service industries. The quid pro quo for lower prices tomorrow is higher profits today. But an illustrative calculation of the division of the spoils shows that most of the profits go to customers—as long as regulators immediately pass on to them all the benefits of productivity improvements at each review.²

Assume that a company introduces a £1 annual efficiency saving at the start of a five-year review period. The present value of the profit (£1 receivable each year for five years) could be expressed as a share of the present value of the stream of efficiency savings over the long run. The present value is based on discounting by the cost of capital, which in the following example is taken as 7 percent real (the rate generally used by U.K. regulators and by the Monopolies and Mergers Commission in its reports on utility license conditions).

<i>Present value of £1</i>	
Per year for 5 years at 7 percent	= £4.1
In perpetuity at 7 percent	= £14.3

The present value of £1 for five years is 29 percent of the present value in perpetuity. This case is reasonably realistic: it is clearly in a company's interest to introduce efficiency savings as early as possible in the review period in order to maximize its profit before the benefit is passed on through lower prices at the next review. The company gets 29 percent of the value of the outperformance, and the customers, since these are long-run industries, 71 percent. Many would agree that this is a good bargain for the customers and that periodic price caps are an equitable system of profit sharing. Whether the same efficiency savings would be generated if a greater share of the benefit went to customers—as it would under the annual formula profit sharing scheme some have proposed—is another issue.

Arguments for annual formula profit sharing

If the U.K. regulatory system is to be changed to incorporate annual formula profit sharing, the motivation clearly would not be to secure a profit sharing system. Such a change should be motivated by other advantages that annual formula profit sharing might have over periodic profit sharing.

In general terms, annual formula profit sharing can be achieved by making the maximum allowed price in any year a function of the

expected or actual economic profit for the year (box 1). Four main advantages have been claimed for annual formula profit sharing:

- It immediately passes on to customers benefits from the company's outperformance rather than delaying this until the next periodic review.
- It reduces the absolute amount of economic profit that can be earned.
- If it is applied symmetrically—that is, if prices can also rise if the company earns less than the normal rate of return—it will reduce profit fluctuations. Because of the way the cost of capital is normally calculated, reduced fluctuation lowers risk and thus the cost of capital.
- It improves allocative efficiency because prices are closer to the actual long-run cost of supply than they are under the periodic price control system.

The first two points, proponents argue, help address the problem of public acceptance of the system. If the system passes benefits on to customers earlier, it will make the role of profit in improving efficiency more immediately apparent. If it also reduces profits, particularly those not due to the efforts of management (windfalls), it will avoid the politically destabilizing effect of large profits in regulated industries, often perceived as resulting from abuse of monopoly power.

The counterarguments

To counter these arguments two questions must be considered. First, does annual formula profit sharing reduce incentives for efficiency? If so, everyone will have to pay a real price for changing the distribution of rewards between customers and shareholders. Second, is there a better way to address the political pressures arising from public anger at directors' salaries in regulated companies and the companies' profit levels?

The argument for reducing the cost of capital has little merit. Regulators already set the X factor using the lowest feasible discount rate (typically 7 percent real). The law requires all

BOX 1 FORMULAS FOR ANNUAL PROFIT SHARING

There are two main types of annual profit sharing formulas:

- A simple approach in which a fixed profit sharing rate or schedule is applied to economic profit.
- A more sophisticated approach in which the company can choose the profit sharing rate based on the prices it sets for the year. This is commonly referred to as sliding scale profit sharing.

In the first approach many advocate using combinations of the following:

- A fixed division of profits—say, 50/50.
- A dead band area where there is no annual sharing.
- A variable tariff determined by the level of economic profit.

The 50/50 schedule is most common because it is judged intuitively equitable. The problem is to specify the annual profit above which the profit sharing schedule applies (figure 1). Regulators have argued against such a scheme in part because it might encourage creative accounting to manipulate reported profit.

In the sliding scale scheme a company is free to choose a lower profit sharing rate if it sets lower prices. Figure 2 shows this as a linear schedule. The company's goal is to maximize its expected retained economic profit, which generally occurs at the point where the marginal gain in economic profit from a higher price cap equals the marginal loss in extra profit share. This should lead to prices lower than the regulator's price cap if the company believes it can outperform the regulator's profit forecast. The sliding scale is better than the annual formula system because it keeps prices closer to the expected actual cost.

regulators to ensure that the regulated businesses can finance themselves. As essential industries, they cannot be allowed to go bankrupt or to lower the quality of service. The normal approach to calculating the cost of capital, which uses profit fluctuations as a measure of the risk of bankruptcy, is therefore inappropriate for regulated industries.

A more important counterargument is that the value of incentives for productive efficiency far outweighs the possible misapplication that arises from prices not being closely aligned with actual costs in any one year. The only reason that prices and costs move apart within a review period is the dynamic incentive for companies to improve efficiency, which reduces the cost of supply in the long run, and prices are realigned with cost at each periodic review. So the long-run incentive for productive efficiency is more important than short-run allocative efficiency.

But it is fair to say that though an annual profit sharing charge on economic profits will inevitably reduce the marginal incentive to improve efficiency, there is little evidence about what the exact effect on incentives would be, particularly if, as many argue, managers are

FIGURE 1 FIXED RATE PROFIT SHARING

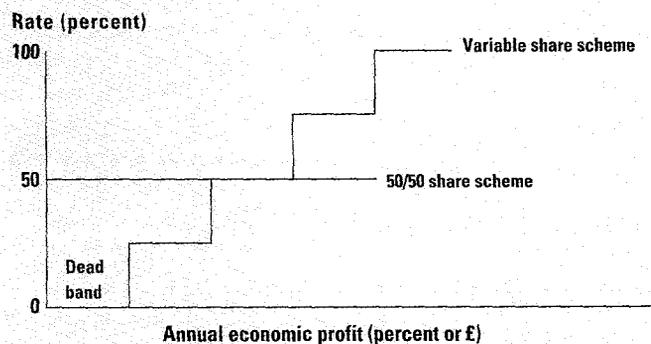
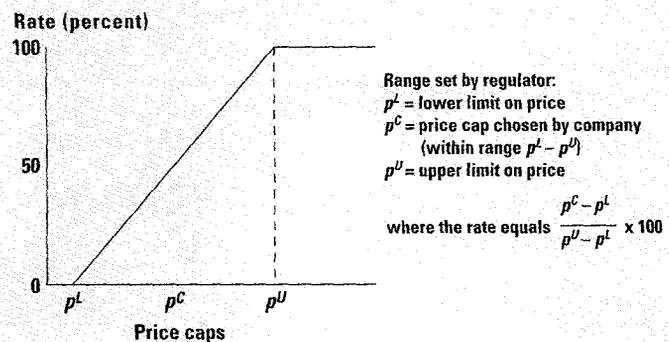


FIGURE 2 SLIDING SCALE PROFIT SHARING



motivated by public service considerations and by such nonfinancial factors as pride in their work. The concern about erosion of incentives is therefore based on theory and on management behavior in publicly owned, nationalized industries, where efficiency was not the first priority.

The better alternative

In a series of periodic reviews before the 1997 general election, U.K. regulators came out against annual formula profit sharing.³ These reviews emphasized the regulators' concerns about maintaining incentives for efficiency and about the profit sharing aspects of the current periodic price cap system. The regulators recognize that public concerns must be addressed, but argue that they have already taken steps to do so, by:

- Introducing automatic correction factors to eliminate windfall gains.
- Ensuring a stable regulatory system in which companies could be encouraged to voluntarily accelerate the return of benefits to customers.

The main automatic correction factor regulators have introduced divides the price cap between fixed and variable cost elements. This means that where the quantity of output supplied differs significantly from that forecast by the regulator, the allowable revenue earned by the company relates more precisely to the variation in actual costs, eliminating gains or losses unrelated to actions by management. A second correction factor, now being introduced, permits clawback of allowable revenue when illegitimate profits result from deliberate slippage of capital programs for which revenue was allowed in the current regulatory period.

Voluntary acceleration of benefits is an approach promoted by the Office of Water Services (Ofwat). The regulator, Ian Byatt, argues that when water companies earn economic profits, they should share them with customers by not fully utilizing the maximum allowable price increase each year. To maintain

efficiency incentives, the present value of that underutilization would be carried forward and its future value (based on the cost of capital) would be added to allowable revenue at the next periodic review.

This scheme would benefit customers through earlier receipt of the gains from efficiency and would not diminish the incentive for efficiency. It would also improve the relationship between the company and its customers, who would see that their gains result from the company's efforts, not solely from regulatory action. But the success of such a scheme depends on a stable and consistent regulatory system in which the regulated companies can be confident that the regulators will stick to their side of the bargain.

Conclusion

Annual profit sharing schemes have immediate political appeal. But they endanger incentives for efficiency. And other, more suitable methods are available to correct for gains or losses not resulting from actions of management. The system of periodic price controls has much to commend it, but better communication of the principles of incentive regulation is required. As Ian Byatt, the water regulator, says, "profits will not generally be acceptable unless their function is understood."

¹ Economic profit is the profit beyond that necessary to earn a normal rate of return.

² See Ivan Vichoff, "Evaluating RPI - X" (NERA Topics 17, National Economic Research Associates, London).

³ See Centre for the Study of Regulated Industries, "Profit Sharing and Incentive Regulation," in *CRI Regulatory Review 1996* (London, 1996).

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The Distribution of Gains from Utility Privatization and Regulation in Argentina

Omar Chisari, Antonio Estache, and Carlos Romero

One of the most common arguments in favor of privatizing infrastructure services is that private owners and operators use resources more efficiently than do public ones. Empirical tests of this assumption have generally focused on privatization's effect on sector performance. Are consumers paying less? Is the quality of service better? Has investment increased? These tests tend to ignore the potential effects of changes in the privatized sectors' performance on the rest of the economy. Yet some of the main arguments against privatizing infrastructure services are that it can hurt the rest of the economy, increase unemployment, and make the poor poorer and the rich richer. Empirical tests of these opposing arguments are not straightforward, since infrastructure privatization is typically only one of many items on the reform agenda of governments undertaking major structural adjustments. That was the case in Argentina. This Note reports on a study that attempts to isolate the net economic and social effects of privatization in Argentina from the overall effects of structural adjustment and to estimate the distribution of the gains and the importance of effective regulation.¹

The reform

Although the privatization of Argentina's utilities is still incomplete, most notably in electricity and water distribution, almost all the companies whose privatization could be expected to have the most important macroeconomic effects were privatized between 1992 and 1995. Some restructuring also took place in each sector before the transfer to private operators.

The transfer of the telecommunications company to private operators was the first, concluded in

November 1990. For this first concession the government awarded short-term monopolies to ensure the entry of private investors and operators in the sector. Two companies now provide services. Tariffs are regulated, and service and quality obligations are spelled out in the concession contracts. The regulatory mechanism is based on a price cap approach (essentially $RPI - X$, where RPI is the retail price index and X is productivity gains, with X to be adjusted after five years). The rates were rebalanced at the end of 1996, but this is not reflected in the results presented here.

The restructuring of electricity started in 1992 with the transfer to the private sector of most public enterprises under federal control, the reorganization of the sector's institutions, and the introduction of a new regulatory framework. The three stages of production—generation, transmission, and distribution—were vertically separated, and different regulatory criteria were adopted for each activity. Generation became competitive, and transmission and distribution became regulated private monopolies. The regulation of tariffs and service quality in distribution and transmission relies on incentive-based mechanisms to ensure that users enjoy the benefits of competition in generation.² The restructuring of gas took place at the end of 1992, when transport and distribution were separated into two transport and eight regional distribution concessions. As in electricity, regulation of tariffs and quality is incentive-based.

In water and sanitation competition has been introduced through a bidding process, and the resulting concession contracts are the main regulatory instrument. The contracts spell out

TABLE 1 CHANGES IN PERFORMANCE OF PRIVATIZED UTILITIES, 1993–95
(percent)

Performance indicator	Electricity distribution	Gas distribution	Water distribution	Telecoms
Efficiency <i>(intermediate input costs as a percentage of total sales)</i>	6.3	8.8	4.9	11.3
Labor productivity <i>(GWh for electricity, thousands of m³ for gas, population served for water, lines in service for phones—all relative to staff)</i>	17.6	4.8	-27.6	21.3
Investment <i>(in concession contracts for gas and actual investments for other sectors)</i>	..	4.6	76.0	28.1
Quality <i>(ratio of losses to production for electricity and gas, of water unaccounted for to production for water, of lines in repair to lines in service for phones)</i>	10.0	27.8	6.1	4.6
Real average tariffs <i>(ratio of total sales value to production)</i>	-9.5	-0.5	7.2	28.4

.. Not available.

Source: Omar Chisari, Antonio Estache, and Carlos Romero. "Winners and Losers from Utility Privatization: Lessons from a General Equilibrium Model in Argentina" (Policy Research Working Paper 1824, World Bank, Economic Development Institute, Washington, D.C., 1997).

service obligations, investment requirements, and quality standards, which are monitored by the national sector regulator. Tariff adjustments are generally based on a cost-plus rule. The first water and sanitation contract was the Buenos Aires concession, awarded in 1993.³

The study and its findings

The study uses a computable general equilibrium model to explore the macroeconomic effects of Argentina's privatization of gas, electricity, telecommunications, and water and sanitation services, the distribution of the gains from these effects, and the importance of regulation to their distribution. The model tracks the direct and indirect effects of changes in tariffs, productivity, and service quality in each utility on all other sectors (including the other privatized utilities) and on capital and labor markets. And it divides the economy into twenty-one sectors and five income classes to reveal which gain the most from the changes.

The study assesses the impact of privatization by simulating the effects on the economy of the changes in privatized utilities' performance

between 1993, the first year by which all the major privatizations had taken place, and 1995, the latest year for which a database is available on each privatized utility. The simulations assume that the changes in the performance indicators can be extrapolated to the yet-to-be privatized utilities. The study approximates the costs of ineffective regulation by comparing results from model simulations in which the gains from reform spread throughout the economy—equivalent to what an effective regulator would achieve—with simulations where the gains are withheld as a rent by the owners of privatized utilities—equivalent to what an ineffective regulator would achieve.

The study faced significant data problems. The indicators do not fully measure the performance changes that occurred with the change in ownership but those that occurred in a two-year period under private management. The performance indicators underestimate the total effect of privatization because the dramatic changes in labor productivity occurred immediately after the private takeover of operations (in 1992–93 for all sectors except telecommunications) and so are not reflected in the fig-

TABLE 2 DISTRIBUTION OF ESTIMATED GAINS FROM PRIVATIZATION AND EFFECTIVE REGULATION OF INFRASTRUCTURE SERVICES, 1993–95

Income class	Gains from private operation		Additional gains from effective regulation	
	Total (millions of 1993 US\$)	As percentage of income class expenditure on utilities	Total (millions of 1993 US\$)	As percentage of income class expenditure on utilities
1 (poorest)	197	29	138	20
2	259	31	142	17
3	373	37	121	12
4	403	32	214	17
5 (richest)	1,047	59	302	17
Total	2,279	41	915	16

Source: Omar Chisari, Antonio Estache, and Carlos Romero, "Winners and Losers from Utility Privatization: Lessons from a General Equilibrium Model in Argentina" (Policy Research Working Paper 1824, World Bank, Economic Development Institute, Washington, D.C., 1997).

ures. While the performance indicators show improvements under private management (table 1), some should be interpreted with care, as they reflect the interaction of many different factors and a relatively short comparison period. In the water sector, for example, labor productivity initially increased tremendously as employment was reduced by 47 percent. Since then investment requirements have compelled the company to recruit workers, but there has been no short-run increase in water production. This explains the deterioration in labor productivity shown in table 1. And finally, because of data gaps and allocation problems, the results do not include the distribution gains arising from investment to improve access to the network—the main source of gains to low-income groups. Thus the results provide a lower bound estimate of the benefits from privatization and effective regulation.

Private operation

The simulation of the effect of private operation shows that all income classes gain from the efficiency improvements due to privatization even if the owners of the privatized utilities get to keep much of the economic benefit, as would be the case with ineffective regulation (table 2). The performance improvements directly affect the welfare of income groups by reducing the consumer (residential) prices of the privatized services and by increasing wages

and salaries. But they also have indirect effects—by reducing the input costs of the industries using utility services and through the reduction in prices of the inputs purchased by the privatized utilities.

The efficiency gains are equivalent to about 0.9 percent of GDP. For households, on average, the gains equal 41 percent of typical spending on utility services. But they are significantly higher for the richest income class (59 percent) than for the poorest (29 percent). This disparity is explained by the fact that when regulation is ineffective, the gains from privatization are captured as a quasi rent by the rich, who are the largest domestic owners of capital in infrastructure services.

Effective regulation

The study's most interesting result is its estimation of the gains from effective regulation. These gains total US\$915 million (1993 dollars), or 0.35 percent of GDP. They average 16 percent of household spending on these services. Although all income classes gain from effective regulation, the poorest gain relatively more—the gains from regulation represent 20 percent of spending by the poorest on utilities, compared with 17 percent for the richest.

The importance of effective regulation for macroeconomic performance is even more

obvious. Privatizing utilities will boost industrial production and GDP whether regulation is effective or not, but the gains will be much larger if it is effective.

Employment

Recent social unrest in some of Argentina's provinces have made privatization's effect on unemployment an important issue. But what is that effect? The model predicts that privatization will reduce unemployment somewhat if regulators are effective. But it may increase unemployment if they are not effective, since some of the stimulus to the rest of the economy that would stem from a wider distribution of the gains would disappear.

This finding is a strong argument in favor of strengthening provincial regulatory capacity in Argentina. But it may not satisfy readers familiar with unemployment trends in Argentina—unemployment increased from 9.3 percent in 1993 to more than 18 percent in 1995. Yet according to the model, in the worst case—that is, if all regulators are assumed to have performed terribly—the changes brought about by the utility privatizations could account for only 2.35 percentage points of the increase. How can this be?

The answer can be found by including in the model the “tequila effect” that hit Argentina in late 1994 and early 1995. As the crisis led to a loss of confidence among international investors, international interest rates rose rapidly, leading to a deterioration in the net debt position of all sectors and income groups. Taking into account this effect, the model predicts the sharp increase in unemployment that occurred. The gains from privatization were not sufficient to offset the negative tequila effect.

Distributional effect by utility

The simulations indicate that the poorest stand to gain the most from improvements in gas and electricity, which are major items in their consumption basket. They also tend to gain rela-

tively more than other income classes from improvements in water and sanitation, although their main source of gain—improved access—is not modeled in the study because of insufficient data. The middle class stands to gain most from improvements in telecommunications, but only if the regulator is effective. If it is not, the middle class will pay a large rent to the private operators.

Conclusion

The study's results suggest very high rates of return for privatization and regulation “projects” in Argentina. The gains from the private operation of utilities are about US\$3.2 billion a year, or 1.25 percent of GDP, and all income classes benefit. Total gains are equivalent to about 80 percent of investments in the privatized utilities in 1993 (US\$4 billion) or more than 60 percent in 1995 (US\$5 billion).

Ineffective regulation cuts the gains from reform by nearly US\$1 billion, or 0.35 percent of GDP. This represents an implicit tax of 16 percent on the average consumer, paid directly to the owners of the utilities. If regulators are effective, lower-income groups tend to gain relatively more than higher-income groups, improving the distribution of income. Thus, rather than illustrating a tradeoff between efficiency and equity, the study shows that privatization can deliver on both counts. In other words, privatization can be a positive sum game.

¹ Omar Chisari, Antonio Estache, and Carlos Romero, “Winners and Losers from Utility Privatization: Lessons from a General Equilibrium Model in Argentina” (Policy Research Working Paper 1824, World Bank, Economic Development Institute, Washington, D.C., 1997).

² See “Regulatory Lessons from Argentina's Power Concessions,” Antonio Estache and Martin Rodríguez-Pardina, *Public Policy for the Private Sector*, September 1996.

³ See “Regulating Water Concessions in Argentina,” Claude Crampes and Antonio Estache, *Public Policy for the Private Sector*, September 1996.

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How Competition Delivers Positive Results in Transport—A Case Study

Ginés de Rus

In this case study the government is initially the monopoly supplier of travel and freight service—by ferry, jetfoil, and airplane—between two islands. It then allows private operators to enter the industry. The first new operator revolutionizes the market, setting off a chain of events that lead to a fall in prices, enormous growth in the market, more varied and attractive services for passengers, and more efficient freight services for business. The experience shows both the dramatic effect of removing barriers to entry by new firms and how the different values consumers place on different kinds of travel time can create market opportunities not foreseen in the typical demand elasticities used by policy planners and forecasters.

The case study market is the traffic corridor between Grand Canary and Tenerife, the main islands of the Canaries. Located in the Atlantic Ocean, the seven islands that make up the Canaries belong to Spain, which lies 1,200 kilometers away. About 85 percent of the islands' 1.5 million inhabitants live on Grand Canary and Tenerife. Initially, both air and sea transport between the two islands were provided by the government, with sea transport by jetfoil and conventional ferry (figure 1).

Before deregulation in December 1994, two public companies monopolized the market—Iberia, which provides air transport, and Trasmediterránea, which provides jetfoil and ferry services. In 1993 air transport accounted for 53 percent of passenger trips, jetfoil for 39 percent, and conventional ferry for the remaining 8 percent (table 1). The services had different cost structures. Air transport, by DC-9 aircraft, was relatively expensive for very short trips, resulting in a high average cost per passenger. Jetfoil transport had relatively low average costs per passenger when occupancy was high at rush hour, though the opportunity cost of the jetfoil in off-peak periods was low. The ferry, a high-capacity mode of trans-

port for passengers driving their own cars and for freight trucks, had room for many additional passengers without vehicles at a cost close to zero.

At this stage prices did not match true cost structures (table 2). The price for air transport did

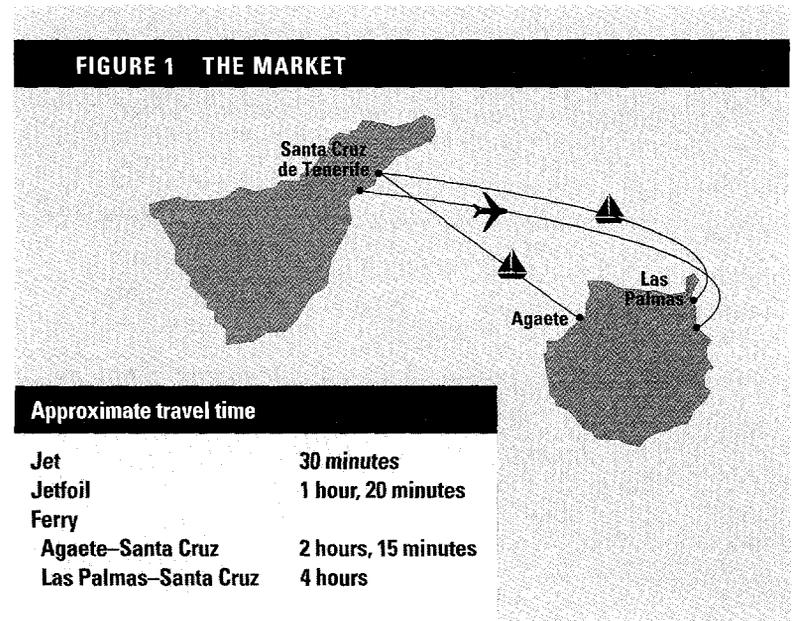


TABLE 1 PASSENGER TRIPS IN THE GRAND CANARY-TENERIFE CORRIDOR

Company	1987	1989	1991	1993	1995	1996
<i>Public</i>						
Iberia	290,520	457,312	557,112	499,256	405,149	428,852
<i>Trasmediterránea</i>						
Jetfoil	418,353	312,114	316,845	361,454	372,252	470,942
Ferry	120,131	110,844	89,047	75,657	28,972	23,711
<i>Private</i>						
Fred Olsen (ferry)	n.a.	n.a.	n.a.	n.a.	662,346	470,000
Armas (ferry)	n.a.	n.a.	n.a.	n.a.	32,080	91,200
Total	829,004	880,270	963,004	936,367	1,500,799	1,484,705

n.a. Not applicable.
Source: Transport operators.

not reflect its much higher cost compared with the average cost of the jetfoil and ferry. There were no off-peak discounts on the jetfoil reflecting excess capacity during weekends or outside rush hour. Thus off-peak service on the jetfoil was too expensive relative to air transport. The price of an ordinary passenger ticket for the ferry was too high given the low marginal cost of carrying passengers. The companies, despite all being publicly owned, made no attempt to develop an integrated pricing strategy.

Because prices were out of line with costs, the market had a highly inefficient modal split. Air transport, suboptimally underpriced, had a large market share thanks to the overpriced jetfoil and ferry, whose prices did not reflect the excess capacity in off-peak hours and the low marginal cost of carrying additional traffic. Jetfoil was still able to compete with air transport, though, because of the time-inclusive cost of travel. While the trip by jetfoil took fifty minutes more than by air, the difference falls to twenty minutes when travel time to the departure gate and waiting time are taken into account. Navigation time by ferry was four hours.

The effects of liberalization

In December 1994 the government allowed new operators into the market. Fred Olsen, a private

operator, set up a ferry service on Grand Canary from Agaete, whose small harbor is 35 kilometers from the island's main port of Las Palmas but closer than that port to Tenerife. Navigation time from Agaete to Tenerife is two hours and fifteen minutes, though traveling from Las Palmas to Agaete to use the new ferry service adds thirty-five to forty-five minutes of driving time.

At first sight the total travel time for the new ferry seemed too high for it to be a serious competitor to air travel and jetfoil. But the new ferry operator undercut Trasmediterránea's ferry prices, charging 60 percent less per car and 30 to 40 percent less per passenger. The competition led to price cuts by Trasmediterránea and changed the market's price structure, traffic level, and modal split. Soon, more new operators entered the market—Armas, a private ferry owner operating from Las Palmas, in 1995, and Air Europa, a private airline, in 1996.

The competition has led to radical changes in the market, revealing previously unimagined demand and introducing new services. Traffic has grown spectacularly, from about 940,000 passengers in 1993 to almost 1.5 million in 1996, an increase of about 60 percent (see table 1). After ranking last for the past ten years, the ferry has become the dominant mode of transport. While in 1993 it carried 8 percent of pas-

TABLE 2 TRANSPORT FARES IN THE GRAND CANARY–TENERIFE CORRIDOR
U.S. dollars

Company	Before deregulation			After deregulation					
	December 1994			July 1995			July 1997		
	Ordinary	Youth	Car	Ordinary	Youth	Car	Ordinary	Youth	Car
Public									
Iberia	28.66	n.a.	n.a.	30.33	n.a.	n.a.	39.86	34.06	n.a.
Trasmediterránea									
Jetfoil									
Peak	36.87	29.49	n.a.	36.87	24.55	n.a.	37.33	24.85	n.a.
Off-peak	n.a.	n.a.	n.a.	26.38	17.16	n.a.	21.33	n.a.	n.a.
Ferry	19.17	15.33	50.78	10.00	7.08	20.00	19.17	13.04	22.53
Private									
Air Europa	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	36.53	31.20	n.a.
Fred Olsen (ferry)	n.a.	n.a.	n.a.	14.00	9.13	20.66	18.00	12.66	21.66
Armas (ferry)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	19.17	13.04	22.53

n.a. Not applicable.

Note: Prices have been converted to U.S. dollars (at 150 pesetas per dollar) and are not adjusted for inflation, which has been low (2.3 to 4.6 percent) during the period of liberalization. Residents are entitled to a 10 percent discount.

Source: Transport operators.

sengers, in 1996 it accounted for 39 percent. The ferry not only can now compete with the other modes of transport, it also has generated a large increase in traffic.

Consumers have benefited from liberalization through price cuts, more frequent departures, and new choices for travel. A review of the market two and a half years after deregulation shows that prices more closely reflect cost differences. Air transport is more expensive, but there are new discounts for young people. Ferry prices have fallen, with prices for cars now half those before deregulation. And a 40 percent discount has been introduced for off-peak trips by jetfoil.

Recently, though, ferry prices have gone up again, suggesting collusion between operators. Both public and private ferry companies have called on the government to introduce "stability" in the market, though there is no evidence that the private companies are under financial

stress—in fact, the level of new investment suggests they are doing rather well. The call has caught the government off guard and unsure how best to react. There is no market regulator with the experience and the framework to deal with competition policy issues and public intervention in transport.

Nevertheless, competition has been broadly successful, an outcome difficult to predict even taking into consideration the full cost of travel—including the price, time invested, and quality. The travel time by ferry is significantly shorter for the new operator because it connects the islands' closest points (Agaete and Santa Cruz de Tenerife). The total travel time between Las Palmas and Santa Cruz is only slightly shorter for the private operator than for Trasmediterránea—which provides direct service between the two capitals—once the travel time from Las Palmas to Agaete is included. Thus total travel time cannot explain the dramatic increase in demand for

the private ferry service. The explanation lies in the value users assign to different types of time: they do not perceive the travel time in their cars as a loss of equivalent utility. The new private operator's larger schedule of departures and the new possibility it offers users to do business and return in the same day while using their own cars also differentiate its service.

Freight transport has also benefited from these developments. Freight prices have been cut by 50 percent, and the cheaper and more efficient sea transport has led some private companies to change their distribution strategy. Companies that used to operate two warehouses—one on each island—have closed one of them. Producing their products on one island, they deliver them on the other by trucks and vans, which can now make their deliveries and return on the same day.

Lessons

This case study provides several useful lessons. First, public enterprises did not serve the public interest. The case study shows classic monopolistic behavior by publicly owned companies in providing a vital transport link between the islands—as evidenced by high prices and low levels of service. *Trasmediterránea* cut prices only after the entry of private companies. Competition also brought the suboptimal pricing to an end—it led to prices that better reflect costs and to off-peak discounts that reflect the excess capacity during the day and on weekends.

Second, the effect of removing barriers to entry can be dramatic. The entry of a private operator offering a new ferry service introduced radical changes in the market. Price competition by the new entrant forced public companies to cut their prices, and demand response exceeded all expectations, attracting another private company to the ferry sector. The new market equilibrium is characterized by more firms, better service, lower prices, and greater demand.

Third, more accurate demand elasticities and the generalized cost (price, time, and quality)

of transport should be used in evaluating policies and forecasting demand. The demand response to price cuts on the Grand Canary–Tenerife link exceeded the most optimist forecasts. No one in the industry, the new entrant included, expected such growth in traffic. The estimated elasticities typical in the transport literature are based on small changes in price and service. But the Canary Islands case combined a substantial price cut with a big improvement in service. The new service, seemingly unattractive because of its high time cost, was in fact highly attractive to consumers because of the values they ascribe to different kinds of travel time. Moreover, the possibility of taking their own cars changed the value users assigned to the time spent traveling.

Fourth, regulators need to safeguard against attempts by operators to reduce competition. Market forces often guide private interests to act for the general good. But giving free rein to private interests can also lead to private monopolistic behavior. This case study shows that brave new entrants can later mutate into timid incumbents, suggesting that the market is well served by liberalization but that some kind of regulation benefits the general interest. Competition policy is not as simple as lifting barriers to entry and eliminating regulation. It is a process of re-regulation in which the market plays the leading role in allocating resources. Antitrust regulation is also essential, however.

Fifth, supranational agreements on trade liberalization can provide critical leverage in efforts to liberalize domestic markets. The economic success of the Grand Canary–Tenerife transport market can be attributed to the government's decision to allow private operators to enter the market and compete. Why did the government change its traditionally protectionist policy? One key reason is the new common transport policy of the European Union, which helped local politicians introduce competition despite opposition from public monopolies.

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Global Trend to Railway Concessions Delivering Positive Results

Louis S. Thompson and Karim-Jacques Budin

Few railways have been truly privatized, beyond such recent examples as New Zealand, Canadian National, East Japan, Conrail in the United States, and the infrastructure and freight services of the old British Rail. Instead, most governments have preferred to concession (franchise) their railways. Why concessioning is usually preferred to privatization is not always clear, but the main reason is probably that governments believe that concessioning offers them the best of both worlds: they retain ultimate control over the infrastructure (at least in the political sense), while the private sector carries out the operating functions and competes for customers.

Rail concessioning is not new. Many railways were originally built and operated as concessions, and if not for the wave of public ownership (especially strong in countries undergoing decolonialization) after World War II, many would never have been publicly operated. Since then rail has performed badly, for two main reasons. First, governments have promoted highways and air travel, often operated by the private sector. Second, and perhaps more important, railways have become mired in politics, often depriving them of adequate capital for investment and repairs, always lumbering them with a confused and contradictory set of objectives in competition with modes that had a much clearer mission. The downward slide of nationally owned railways has coincided with increasing globalization and tightening national finances. Governments can no longer afford bad rail services, and this has led to politically painful measures to fix the problem. These pressures prompted reform in the early 1990s in Argentina and the United Kingdom and the early steps toward reform by the European

Commission. The success of the early concessions—and the lack of credible alternatives—has caused a snowballing of such reforms in Latin America. Concessioning is also beginning in Africa and the Middle East and, tentatively, in Asia. A similar process, based in part on concessioning and franchising and in part on privatization, has also taken hold in the European Union. (Tables 1, 2, and 3 show basic railway indicators for actual and forthcoming concessions and privatizations, by region, excluding Europe.)

Case studies

There have been interesting pioneers in these regions. The rail concessions in Argentina involved several innovations: they were the first negative concessions and they were the first to require concessionaires to share tracks. But the impact of complexity and lack of transparency in the initial bidding process is also instructive. Brazil had the first concession for which the World Bank directly funded severance payments. Chile introduced the first real separation of infrastructure and operations. Mexico achieved rapid implementation and emphasized fostering cross-border traffic. And Côte d'Ivoire and Burkina Faso launched the first new rail concession in Africa and the first binational operating concession with the Abidjan-Ouagadougou railway, which links their capital cities.

Argentina

The concessioning strategy adopted by the Argentine government was grounded in five basic principles: The railway deficit was no longer sustainable. The monolithic federal railway was unsalvageable as an enterprise. Some freight

TABLE 1 ACTUAL OR POTENTIAL RAILWAY CONCESSIONS IN LATIN AMERICA
(1994 or latest available year)

Country, railway	T-km (000,000)	P-km (000,000)	Line (km)	Employees	TU/km (000)	TU/employees (000)
Argentina^a	7,037		29,118	5,151	242	1,366
<i>NCA (1997)</i>	1,741		4,520	865	385	2,013
<i>FEPSA</i>	982		5,163	575	190	1,708
<i>Ferrosur Roca</i>	854		4,791	808	178	1,057
<i>Bs. As. al Pacifico</i>	2,029		5,493	1,079	369	1,880
<i>Mesopotamico</i>	620		2,751	524	225	1,183
<i>Belgrano</i>	811		6,400	1,300	127	624
Bolivia	836		3,261	5,255	188	133
<i>Andina (1995)</i>	322	114	2,082	2,443	209	203
<i>Oriental (1997)</i>	514		1,179	632	436	1,089
Brazil						
RFFSA^b (1996)	35,118		21,715	28,401	1,805	966
<i>Nordeste</i>	674		4,260	4,402	158	153
<i>Centro-Leste (Centro Atlantico)</i>	6,917		7,092	3,400	975	2,034
<i>Sudeste (MRS Logistica)</i>	18,580		1,770	5,528	10,497	3,361
<i>Sul (Sul Atlantico)</i>	6,939		6,814	10,208	1,018	680
<i>Terezina Cristina</i>	92		168	351	548	262
<i>Oeste (Novoeste)</i>	1,916		1,611	2,512	1,189	763
FEPASA	6,520	1,100	4,929	15,319	1,546	497
CVRD^c						
<i>EFVM</i>	50,137		898	4,991	55,832	10,045
<i>Carajas</i>	37,500		1,175	1,814	31,915	20,673
Chile Freight, FEPASA^d (1997)	816		2,200	475	371	1,718
Costa Rica^{e,f}	80	72	480	2,300	317	66
Guatemala^{g,h}	28	240	640	430	420	624
Mexico, FNM	37,300		20,360	48,030	1,820	775
<i>Northwest^g</i>	17,200		6,200	21,300	2,774	808
<i>Northeast^g</i>	14,000		3,960	9,830	3,535	1,424
<i>Southeast^g</i>	3,200		2,200	9,043	1,455	354
<i>Chihuahua al Pacifico^g</i>	600	84	1,457	2,053	469	333
<i>Short lines</i>	2,300		6,543	5,804	352	396
Peru	483	242	1,609	3,337	450	217
<i>Southeastern</i>	5	83	185		474	
<i>Central</i>	209	49	509		507	
<i>Southern</i>	269	110	915		414	

Note: Covers primarily freight railways. Italics indicate that railway has been concessioned. T-km means metric-ton-kilometers. P-km means passenger-kilometers. TU means traffic units, the sum of metric-ton-kilometers and passenger-kilometers. Some employee totals do not add because they include central overhead employees not transferred to the concessionaires.

a. The Argentine concessions were completed between 1993 and 1995. Suburban passenger concessions are not shown.

b. The RFFSA concessioning was completed in 1996 and 1997.

c. CVRD (parent company) was privatized in April 1997.

d. Concessioned in June 1995.

e. Estimated on the basis of 1988 data.

f. Currently out of service.

g. Data are estimated.

Source: Authors' compilations.

services were probably viable. The Buenos Aires suburban passenger services, though loss-making, were so important to the city's development that they had to be continued. And operating efficiency, particularly staffing levels, would have to be improved.

By mid-1990 the government and the World Bank had agreed on a plan that called for restructuring the railway into several separate freight and commuter rail networks, concessioning these networks, rationalizing intercity passenger services, establishing new rail regulatory agencies, creating a metropolitan transport authority for Buenos Aires, revising operating practices and rules, reducing the workforce and improving productivity, and disposing of redundant assets.

Six freight packages were created for concessioning on thirty-year terms, with an optional ten-year extension. The concessionaires have exclusive use of the tracks but must grant access to passenger operations in return for a compensatory track fee. Bids for the freight networks were evaluated using the net present value of the *canon* to be paid to the government during the first fifteen years of the concession, the quality of business and investment plans, staffing levels, the proposed track access fee for intercity trains, and the share of Argentine interest in the consortium. The weighting used reflected the importance attributed to investment in the railways, but also political compromises on employment.

The perceived lack of transparency in the freight concessioning led to a simpler process for the suburban passenger concessions. Bidding documents defined the minimum service to be provided (seats per hour, frequency, travel time, punctuality) and a required capital program to make up for years of neglected maintenance. Maximum fares were established for standard service, with fare increases as a premium for improved services. Bidding was on the basis of lowest government payment, allowing the government to ensure that the bidding process was direct and transparent, yet

leaving the concessionaires with the commercial risks and the responsibility for decisions on the timing of investments.

The level and timing of the investment program are now being renegotiated. In freight the reason is that demand will not support the promised investment levels. By contrast, suburban passenger and metro demand is so much higher than expected that the government-specified capital program is proving inadequate, so new provisions for investment must be made. Although most of the freight concessions appear stable, none is highly profitable, and some may even be in financial trouble. Traffic density on Argentina's freight railways is low, and success will be hard to come by. In addition, most intercity rail passenger services have been lost for good. That said, the freight concessions have made real gains in performance: a turnaround in traffic trends, a quadrupling of labor productivity, improvements in service quality, reductions in prices, and a reduction in the public deficit of about US\$600 million a year (equal to about 0.5 percent of GDP).

Brazil

Before reform in Brazil, there were four principal railways—the national railway (RFFSA), the railway of São Paulo State (FEPASA), and the two railways owned by the Companhia do Vale do Rio Doce (CVRD)—totaling about 30,000 kilometers of track. RFFSA was the largest, accounting for about two-thirds of the track, rolling stock, and employees. Rail accounted for about 25 percent of freight movement (measured in metric tons per kilometer), but there were almost no intercity passenger services.

Reform started with RFFSA. The government considered many options before settling on the concessioning of six exclusive regional systems, a configuration that seemed optimal because of regional differences in geography, track gauge, and rail traffic. Two other major considerations for the government as it assessed restructuring were employment and the condition of track and rolling stock.

Big redundancies were inevitable and required careful handling to prevent their becoming an obstacle to reform. The government developed a redundancy package and target employment levels reflecting an average reduction of about 40 percent. In addition to legally required severance payments, the redundancy package included incentives for early retirement and voluntary separation, involuntary separation grants for the remaining redundant staff, retraining programs aimed at regional employment opportunities, and job search and outplacement assistance. On average, the total package corresponded to about twenty-one months of salary. The program was phased. Before concessioning, it introduced the incentive schemes for early retirement and voluntary separation, with involuntary separation possible, depending on the results. In the second phase, after concessioning, RFFSA paid or will pay involuntary separation grants to the remaining redundant staff not hired by the concessionaire. Compensation for any additional employees laid off is the responsibility of the concessionaire. Because the initial employment decision is out of the concessionaire's hands (unlike in Argentina), it will be harder for the concessionaire to reach the most efficient levels of employment. This fact undoubtedly was reflected in the auction prices.

The government also faced a maintenance crisis. Government investment in RFFSA had declined significantly in the previous few years, and network quality suffered badly. By mid-1995 locomotive availability had fallen to less than 50 percent, causing RFFSA to refuse traffic. In the first eight months of 1995 more than 200 accidents occurred, and the continued deterioration of the roadbed meant further reductions in speed and service quality. The government was forced to undertake emergency track repair and rolling stock renewal so that the new concessionaires could assume the systems in operable condition (and meet the requirement to lower the accident rate in the first five years of operation).

All six concessions have been successfully auctioned on the basis of the highest bid above

the government's stipulated minimum price. Concessionaires are required to make an upfront payment immediately after the auction and then a stream of predetermined payments over the life of the concession. Once the RFFSA program began, the Brazilian government decided to sell its equity in CVRD, which resulted in privatization of the two railways that CVRD owned. The national government is also negotiating with the government of São Paulo State on a concession for FEPASA similar to that for RFFSA. Rio de Janeiro State is concessioning its suburban passenger services (Flumitrens) and metro along lines similar to those used in Buenos Aires. São Paulo is engaged in a similar effort. In a few years Brazil will have no railways left in public operation.

Initial indications are that the concessionaires are rapidly developing their traffic base and reducing costs. There is good reason to expect that results in Brazil should equal or even surpass those in Argentina.

Chile

For several reasons, particularly the continuing importance of passenger services, the Chilean government rejected the Argentine approach. Instead it initially decided to concession only the freight services on the broad-gauge network while keeping the infrastructure and passenger services in public hands. This concession, launched in 1995, was the first based on full infrastructure separation.

The freight concession (also called FEPASA) has faced a difficult battle in its first years of operation. It has had to stabilize traffic, learn to live with its public sector infrastructure partners, get locomotives back in service, and stand up to the challenge of trucks (not easy, since the average freight haul distance in Chile does not favor rail). Recent traffic trends suggest that it will win the battle.

The government, not fully satisfied with the operations remaining in public hands, has committed itself to concessioning the infrastructure

TABLE 2 ACTUAL OR POTENTIAL RAILWAY CONCESSIONS AND PRIVATIZATIONS IN ASIA AND NORTH AMERICA
(1994 or latest available year)

	T-km (000,000)	P-km (000,000)	Line (km)	Employees	TU/km (000)	TU/employees (000)
<i>Canadian National^a</i>	159,540		29,700	27,979	5,372	5,702
<i>New Zealand^b (1996)</i>	3,260	525	4,000	4,500	946	841
<i>Pakistan^c</i>	5,939	16,385	8,775	116,026	2,544	192
<i>United States, Conrail</i>	128,627		19,082	24,728	6,741	5,202

Note: Covers primarily freight railways. Italics indicate that railway has been privatized. T-km means metric-ton-kilometers. P-km means passenger-kilometers. TU means traffic units, the sum of metric-ton-kilometers and passenger-kilometers.

a. Privatized in late 1995.

b. Passenger traffic estimated.

c. Most traffic is passenger.

Source: Authors' compilations.

in one piece and to concessioning the passenger operations in one intercity piece and two suburban services. These concessions will be complex and will take another year or so to show results. In addition, Chile recently concessioned its meter-gauge railway (the old Ferronorte, which had been operated separately from the broad-gauge railway) and the Arica-La Paz railway, one of the steepest and most difficult in the world.

Mexico

Mexico is in the unusual situation for a developing country of sharing a border and a free trade area (NAFTA) with an industrial country. It has sliced up and concessioned its system in a way that maximizes opportunities for both cross-border traffic and domestic flows. Mexico divided the system into three major pieces and a terminal company serving the Federal Capital area that will be jointly owned by the three concessionaires. The northeast concession, connecting to the United States at Nuevo Laredo, was sold first (for about US\$1.4 billion), to a Mexican-U.S. consortium headed by a large Mexican transport company (TMM) and a U.S. regional railway (the Kansas City Southern). The northwestern concession (Pacífico Norte) was recently sold for US\$524 million to a consortium of Mexican industrial interests and the Union Pacific Railroad of the United States. The government intends to market the southeastern concession

soon, along with a series of short lines that, like those in the United States, appear to have more value as independent operations.

The Mexican government proceeded in a different way than the others, adopting an approach that appears to be useful for governments wanting to move rapidly. It divided the railway (FNM) into the four planned concessions, then converted the concessions into stock companies with separate management teams. The government then sold a controlling interest in the stock by sealed bid (the remaining stock must be offered on the stock exchange or purchased by the concessionaire at the original price). By selling stock rather than the concession, the government was able to transfer a going concern, in a process that can occur more smoothly and rapidly than a concession alone. And it was able to influence FNM's actions before concessioning was finished. The concessioning was completed too recently to report results.

Côte d'Ivoire and Burkina Faso

The Abidjan-Ouagadougou railway links the capital cities of Côte d'Ivoire and Burkina Faso and has a history of binational ownership. Advised in the later stages of the concessioning by the World Bank, the governments jointly awarded a fifteen-year concession in 1994 to SITARAIL, which began operations in August 1995. SITARAIL is a consortium made up of a

TABLE 3 ACTUAL OR POTENTIAL RAILWAY CONCESSIONS IN AFRICA AND THE MIDDLE EAST (1994)

	T-km (000,000)	P-km (000,000)	Line (km)	Employees	TU/km (000)	TU/employees (000)
Cameroon	592	450	1,006	3,853	1,036	270
Congo (Brazzaville)	339	421	510	4,989	1,490	152
<i>Côte d'Ivoire and Burkina Faso</i>	417	163	1,155	1,823	502	318
Gabon	295	98	683	1,893	575	208
Malawi	52	65	789	3,658	148	32
Senegal and Mali (international only)	752	346	1,548	4,935	709	222
South Africa (Spoornet) ^a	92,536	9,204	33,275	150,470	3,058	676
<i>Togo (management contract)</i>	19	9	532	800	53	35
Zambia	1,025	241	1,273	8,544	995	148
Jordan	675		293	1,219	2,304	554

Note: Covers primarily freight railways. Italics indicate that railway has been concessioned. T-km means metric-ton-kilometers. P-km means passenger-kilometers. TU means traffic units, the sum of metric-ton-kilometers and passenger-kilometers.
a. Considering concessioning five suburban passenger operations.
Source: Authors' compilations.

private shareholder (51 percent), both governments (15 percent each), railway staff (3 percent), and local private investors (16 percent). The majority shareholder is itself a consortium of international freight forwarders, an international shipping line, an Ivorian investment group, and international railway engineering consultants. The consortium approach, with a controlling strategic shareholder from the private sector but significant public ownership, is one that has been adopted elsewhere (for example, in Bolivia, Chile, and some of the Argentine freight concessions). It responds to a lingering political belief that there ought to be continuing local awareness of railway performance and some public stake in the railway's success.

Unlike most rail concessions, SITARAIL provides both freight and passenger services and can set the tariffs for both. It also is obligated to operate public services at the local or national government's request. It would run these service obligations under separate contracts specifying the service characteristics and the financial

compensation. There has been no request for such service, even though the concessionaire abandoned all unprofitable local passenger services when it took over the railway.

Because of the relatively short concession period, the concessionaire does not own rolling stock or other equipment. Instead, two national "railway landlord corporations" were established to own track and equipment and lease rolling stock to the concessionaire as necessary (though the concessionaire may purchase its own equipment). These landlord corporations also finance infrastructure investment, though SITARAIL defines and implements the program and contributes a fee for debt service. SITARAIL is also responsible for maintaining the track and equipment. All these arrangements are meant to ensure that it is the concessionaire, acting out of commercial interest, that makes decisions on investment needs and timing.

SITARAIL's payments for the concession are threefold: a usage fee related to revenues on

the railway, to be negotiated every three years; the debt service payment incurred by the landlord corporations; and a lease fee for the use of motive power and equipment. Most payments are kept in an investment and renewal fund to allow the landlord corporations to renew the equipment as necessary. Since the concessionaire both selects the timing and level of investment and pays the debt service, the payment arrangements ensure that commercial incentives drive investment decisions. And because the usage fee will be renegotiated every three years, the concession will evolve with the revenue streams and required investment levels. The payment arrangement represents a compromise, common in concession agreements, among three objectives: removing railway operations and decisionmaking from the government realm; reducing uncertainty for investors, who are reassured by a phased negotiation; and maximizing government income from the concession.

The concession agreement contains an important—and controversial—feature. Most railways are concessioned on an exclusive basis, with perhaps some access rights for connecting railways to certain track segments, vital for creating competition in major markets (as in Mexico) or for noncompeting services (such as passenger services on freight tracks). The governments granted SITARAIL only a seven-year exclusivity period, after which SITARAIL must grant track access, for an agreed fee, to any third-party carrier they specify. This arrangement too was a clear compromise—between the governments' desire to reap the benefits of allowing competitive access to the tracks and the private sector's preference for full control over the tracks and over the market, to make forecasting revenues easier and earning adequate profits more feasible.

Although the SITARAIL concession has been in place only two years, the initial results are encouraging. Much that SITARAIL has done mirrors the actions of the Argentine concessionaires, and the results too are much the same as those in Argentina at this stage in the process.

Lessons

Rail concessions cannot be reduced to a simple recipe. But in defining a concession, all governments have to specify many of the same dimensions—the term, concessionaires' rights and obligations, investment responsibility, the tariff regime, the bidding process, and preset rules for renegotiation.

Experience shows that, although all concessions are different, there are several common fault lines. First, the term of the concession must be consistent with the government's objectives for the balance between public and private investment. In general, the private sector will not finance assets whose service life is significantly longer than the term of the concession. Second, public enterprises tend to lose interest in operations and maintenance as soon as plans for concessioning are announced, so once started, the concessioning process should be finished as quickly as possible. Third, railway concessioning has always lowered employment levels, so a responsible program for dealing with redundant labor must be developed. Fourth, risks should be in the right place. Retaining the environmental risks of cleaning up already polluted facilities is acceptable for government, but taking the commercial risk of projecting demand and cost of operation is questionable. Fifth, concessions inherently require continuing government involvement in regulating safety, monopolistic behavior, and compliance with the pricing and service requirements of the concession. This does not necessarily mean creating an elaborate new regulatory mechanism, but the state cannot walk away from its transport concessions once they are completed.

Finally, defining how the “winner” will be selected is no trivial matter. Precision in procurement would suggest that everything should be defined perfectly and price alone should be the determining factor. But allowing the concessionaire maximum initiative argues for broad performance specifications from government, followed by flexible offers from the private

concessionaire. Even the issue of price needs care. There can be a choice in the basis for award between, for example, maximum payment to government (or minimum payment by government) and minimum tariff. There can also be a choice between unrestricted bidding and prequalification followed by bids only from those judged fully qualified. There are no universal answers to these questions. There are only informed choices, and calculated risks.

Each country has approached its problems slightly differently, providing different insights into what can be achieved through concessions. But a few common trends can be discerned. Restructuring and substantial government investment in the design of the concession pay off. If allowed to, concessionaires can do exactly what is expected—increase traffic, improve service, and enhance labor and asset efficiency. There is nothing magic about this. Concessions work because government interference is ended and commercial management techniques are introduced and allowed to operate.

A growing number of companies and consortiums are interested in investing in railway concessions—if the concessions are offered on reasonable terms. In almost every concession the new majority owners are local investors—thus, no “recolonialization” has occurred. Instead, the local owners have partnered with experienced foreign firms (Canadian, Chilean, French, Portuguese, and U.S.) holding only a minority share in the equity of the concession.

Experience also shows that both positive concessions (where the concessionaire pays the government an agreed sum for the concession rights) and negative concessions (where the government pays the concessionaire for operating and maintaining the property) are possible. So loss-making but socially necessary services can also be concessioned.

Looking ahead, perhaps the most important innovation in railway organization over the next few decades will result from the European Commission’s Directive 91-440 and its follow-

on orders opening national networks to operations by all qualified carriers. While Directive 91-440 explicitly requires only that infrastructure accounts be separated from operations accounts, it implicitly requires that social passenger services, intercity passenger services, and freight services be accounted separately to show that state subsidies are limited to social passenger services. The order has launched a clear trend in the European Union toward institutional separation of infrastructure from operations by creating a perception of infrastructure as a state responsibility and operations (except for social services) as commercial. An eventual result of institutional separation will be franchising or even privatization of most freight services and possibly intercity passenger services. British Rail has shown that total privatization is possible, and Deutsche Bahn AG (Germany) and Ferrovie dello Stato (Italy) have announced plans to privatize freight services as an initial step. Romania is also considering privatizing freight services, though it has no plans to privatize infrastructure.

The authors acknowledge the help of Nicola M. Shaw and Kenneth M. Gwilliam. For more detail on the general subject area, see Nicola M. Shaw, Kenneth M. Gwilliam, and Louis S. Thompson, “Concessions in Transport” (Paper TWU 27, World Bank, Transport, Water, and Urban Development Department, Washington, D.C., 1996).

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The Benefits of Separating Rail Infrastructure from Operations

Louis S. Thompson

Why separate infrastructure from operations?

Today there are thousands of kilometers of freight trackage in the United States over which two—and often more—railways operate regularly and safely. Tracks in Argentina, Canada, Chile, and Japan also have multiple users. Thus there is no question that rail infrastructure can be separated from operations. The question is when it should be, and what are the costs, benefits, and challenges of doing so.¹

There are several reasons for separation. The first is to reduce unit costs. The more traffic a rail line carries, the lower is the unit cost. A railway can often allow a new operator on a line at a charge higher than its added costs, but far lower than the cost to the tenant operator of providing its own facilities. This was the impetus for the voluntary, private trackage rights agreements that arose in the United States.

The second reason is to create intrarail competition. The U.S. Interstate Commerce Commission often gave one railway the right to operate over another in order to create competition between the two (although the competition is often vitiated by the fact that an unwilling owner can make life difficult for the tenant despite the tenant's apparent "rights"). The European Commission (EC), through its Directive 91-440, also envisions such competition. In fact, because of a fear that the publicly owned infrastructure agency would create problems for the tenant railway (particularly when the tenant competes with the owner's services or is another government railway), the European Commission and most European railways are moving toward institutional rather

than accounting separation in order to ensure the neutrality of the infrastructure provider. In Mexico, to create rail competition at least in major markets, the new railway concessions mandated trackage rights over critical track segments. U.S. railway mergers have prompted many observers to suggest creating a national railway infrastructure corporation that would give all operators equal access. The U.S. debate may become urgent if the four largest railways propose more mergers among themselves or with smaller railways.

The third reason is to improve the focus on services provided. In 1971 the U.S. government—with the avid agreement of most of the U.S. private freight railway industry, then barely surviving the competition with (federally subsidized) trucks and barges—concluded that the freight railways had lost the interest and the ability to provide (unprofitable) passenger services. The only hope for sustaining national passenger services seemed to be to create a separate company (Amtrak) focused entirely on providing such services. At the time it was thought that since Amtrak would need continuing budgetary support from the government, a publicly owned company would be a better vehicle.

The fourth reason is to clarify public policy. In Sweden, for example, the government wanted to pinpoint its support for social objectives and to ensure competitive balance in public support for transport. By separating rail infrastructure from operations, the government could target its support in a way that compensated railways for the support to highways and allowed it to cover the social costs of the environmental impact of different transport modes. The

government can now tell what it is paying for and support only what it intends to.

Infrastructure separation can also help improve the balance between the public and private sectors. Defensible arguments can be made that the public sector should plan and ensure the provision of essential transport infrastructure. But as long as the dogma of the monolithic railway prevails, public agencies—supported by the public treasury—also must conduct rail operations. Separating infrastructure allows the conundrum to be broken: critical infrastructure can continue to be publicly planned and provided, but rail services can be divvied up between public and private agencies. Mixed solutions become possible, with the public sector operating some services (urban transport) and the private sector operating others (freight).

Privatization clearly does not need to be an objective. But recent experience with negative concessions (in which the private sector provides public services in return for compensation) has added another dimension to the public versus private debate. Infrastructure separation thus permits new approaches to meeting public responsibilities. The burden of proof now lies where it should—what works best?

Recent examples

Sweden, the United Kingdom, and Argentina show the broad alternatives in rail infrastructure separation. In 1988 Sweden split its state railway into two state agencies—Banverket, which owns and maintains the infrastructure, and Swedish State Railways (SJ), which provides operating services. Judged by the objectives—balancing state support for railways and highways and internalizing various external costs in the rail user's calculus—the separation has been successful. SJ has increased its efficiency (Banverket has done less well) and improved its financial performance even though Swedish freight rates are among the lowest in the world. Banverket has undertaken deferred track maintenance as well as many mandated projects.

The main problem has been coordination between SJ and Banverket. SJ believes that it should determine which track work is needed and when, while Banverket necessarily follows politically determined funding orders. In effect, the market-driven agent does not fully control one of the most important parts of its production function. But all parties seem to agree that the new arrangement is an improvement over the old one.

In the United Kingdom the government split British Rail into four broad groups: twenty-five or so rail passenger franchises, six freight operators (quickly merged into two), three companies (Roscos) to own rolling stock for lease to the passenger franchises, and Railtrack, the agency that owns, maintains, and dispatches the infrastructure. During the process the government sold its stock in Railtrack to the public and sold the freight operating businesses and Roscos in their entirety. The passenger franchises were awarded to private operators on the basis of the lowest subsidy or highest franchise fee offered (only one franchise had a positive offer in the first year, with many offering payments in the out-years).

If, as some have argued, the government's main objective was ideological—privatization—then it succeeded. If the objective was to reduce budgetary outlays, it may be too soon to judge—though subsidies to freight have ended and, of course, the government pocketed roughly £5 billion from the sale of Railtrack equity, rail freight, and the Roscos. The complexity of the new institutional setup makes before-and-after comparisons difficult, but rough productivity measures suggest that the new arrangement should be more efficient. If the objective was to improve rail service, again there remains room for argument. There are many complaints about lack of coordination among the many passenger operating companies, and disagreement between the regulator and Railtrack (and some of the operators) about the amount of investment needed. Yet freight service demand appears to be growing, and there is at least anecdotal evidence that the

passenger franchises are moving as quickly as they can through a complex transition.

The main criticism of the U.K. process is that the costs of the transition were high, especially the interim and start-up disruption and the need for expensive contractual arrangements among the players. In addition, the initially poor coordination among the franchise owners has shown that twenty-five passenger franchises are too many, and some formal or informal mergers are in prospect (there are only thirteen owners for the twenty-five franchises). And six freight companies immediately became two. How well Railtrack and the Roscos interact with their users remains to be seen.

The Argentine experience deserves mention because it was the first in a developing country (though it actually preceded the U.K. program) and because it showed that infrastructure can remain in public hands while the private sector provides both profitable and social services. It also demonstrated that separation and concessioning can work, while benefiting both the nation as a whole and rail service customers. Experience in Bolivia, Brazil, Chile, and Côte d'Ivoire and Burkina Faso has confirmed this conclusion.

Critical issues

It would be nice to conclude that infrastructure separation always works and that all a government needs to do is get out the cookbook. But infrastructure separation is never that straightforward, even in a single country with relatively simple operating patterns. And multicountry situations such as the European Union add further complexity to questions that have not been fully resolved in Sweden or the United Kingdom alone.

Capacity management

Capacity management is an obvious challenge. In monolithic railways this problem is suppressed by fiat. The executive simply decides (more or less arbitrarily, taking into account de-

partmental conflict, operational arguments and advice, and political imperatives) which services get which priority. In Europe the challenge is far greater. A national railway may resolve the problem within its borders, but the lack of knowledge and unified control of what happens elsewhere can dramatically reduce the ability to manage capacity. When connecting systems have different dispatching priorities and different amounts or qualities of information (or decisions are perverse), it is nearly impossible for a railway operator to plan and manage integrated services across several systems. This is a problem with which U.S. rail systems, dealing with many company boundaries, are very familiar.

The solution is clear in concept: operators must be able to approach infrastructure providers as a seamless system for time slot availability (both in advance and from day to day) and real-time information on train locations. In principle, given cooperation among the infrastructure agencies, adequate investment, and compatible technology (conditions about as likely in the rail sector as elsewhere), there is no reason that this challenge cannot be met. If it is not met, rail freight will have a hard time living up to its potential.

Infrastructure pricing

Equally challenging is pricing rail infrastructure capacity in a transparent, efficient, and nondiscriminatory way. On this score neither the EC directives nor Swedish or U.K. (or U.S.) practice offer much help for a multicountry market. International transparency would require developing and implementing all infrastructure tariffs publicly, a test that Banverket meets (and the German infrastructure company, DB Infrastructure, will meet) but Railtrack does not. It would also require making the results of access price negotiations held in private available to other operators.

More theoretically challenging is the question of economic efficiency and discrimination. The Ramsey pricing principle—that the departure of prices from marginal cost should be greatest where price elasticity of demand is the smallest

(charging what the market will bear)—is well established in the rail sector. Theory shows that this is the most efficient way to recover fixed costs, but a century of U.S. regulatory politics shows that users object to being considered “price-inelastic,” particularly when they think a competitor gets better treatment. Dealing with the politics of price discrimination has been difficult in the United States. It will be even more difficult in an international setting.

Who does the discriminating is even more important. At least in principle, the agent doing Ramsey pricing should be the one that best knows the customer—the operating companies, not the infrastructure agency. Infrastructure agencies should generally pursue a relatively simple, open, utility model of capacity pricing, while the operators carry out the confidential, market-based price discrimination. On this principle, Banverket, Railtrack, and DB Infrastructure will have to review their approaches carefully, as will all new infrastructure entities. The European Commission will have to examine (and perhaps harmonize) pricing strategies to make sure that even simple pricing structures are not being twisted to serve local objectives—for example, by trying to load essentially domestic suburban infrastructure costs onto international operators.

Implementing such a scheme across borders will be difficult, especially in real time. Operators need to buy slots from origin to destination, not just border to border, and they may need to do so quickly. Thus operators will need to be able to interrogate infrastructure agencies’ databases to determine where and when slots are available. And they will need to access prices quickly and to purchase and reserve slots reliably. The information systems needed are possible with today’s technology, but may far exceed what some infrastructure agencies are willing to accept.

Economists take the easy way out, proposing minute-by-minute slot auction schemes that are impossible to implement. A simpler idea is to develop a secondary market in slots. Infrastruc-

ture agencies would market a share of their capacity to operators that can buy and pay for capacity scheduled far in advance (such as suburban trains and international passenger expresses). The capacity left over could be sold to bulk purchasers, which could then resell real-time bits and pieces to retail purchasers.

Infrastructure separation—compared with what?

The problem with threatening futures is that they tend to be compared with a past that never existed or a present that will not continue (often both). It is true that infrastructure separation is messy and expensive. Operating companies will have to scramble to find customers at the right balance of prices, quality, and costs, competing with other transport modes aggressively and defending and expanding their market shares in a business climate that demands high-quality, seamless service. Infrastructure agencies will have to offer track capacity in a way that permits their only customers—the operating companies—to survive and prosper in a transport market that would happily extinguish rail service. But in the final analysis, only one kind of efficiency matters: offering the customer the right combination of price and quality. If fragmentation offers a better fit for customers, that will be a small price to pay for survival. Infrastructure separation is no panacea, of course, and it may offer little to small, simple railways with limited services. But for more complex railways in countries with market-driven transport sectors, infrastructure separation may be the only alternative.

¹ Infrastructure separation means that the operators of transport services work at arm’s length from the provider of the fixed facilities. In railways separation can begin with merely keeping the accounts for infrastructure and operations separate, but it can extend to having different entities to own, provide, and control the infrastructure, and an entirely independent set of operators.

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