

An Agenda for Action

INFRASTRUCTURE POLICY IS UNDERGOING MULTIFACETED revision. More than a decade has passed since the first widespread efforts to restructure and privatize network utilities. During that time the high-tech (especially Internet) bubble inflated, then burst—leading to the collapse of stock markets around the globe. In addition, developing and transition economies experienced a series of financial crises and a sharp drop in private investment in infrastructure (from a peak of US\$130 billion in 1997 to about US\$60 billion in 2001). More recently, California’s electricity crisis has confounded regulators, analysts, and other experts.

As a result policymakers in developing and transition economies are seeking clear answers on what to do about infrastructure, and reassurances on (or qualifications of) confident messages from the past. The world’s media, which just a few years ago was praising privatization in near harmony, is now focusing on the growing skepticism and social costs of shifting infrastructure activities from public to private control (box 6.1).

There is compelling evidence that restructuring and privatization, when designed and implemented well, can significantly improve infrastructure performance. Still, critics of reform are right to point out the many cases where privatization has been undertaken without institutional safeguards and conducted in ways widely viewed as illegitimate. Under those circumstances transferring state assets to private control may have been a dubious achievement (Stiglitz 1999). Moreover, concerns are growing about the distributional effects of privatization and market liberalization—especially their effects on basic services for poor households and other disadvantaged groups (Chisari, Estache, and Wadams Price 2003).

Box 6.1 The World Bank Wonders about Utility Privatizations

THE WORLD BANK, THE APOSTLE OF PRIVATIZATION, IS HAVING A crisis of faith. What seemed like a no-brainer idea in the 1990s—that developing nations should sell off money-losing state infrastructure to efficient private investors—no longer seems so obvious, especially when it comes to power and water utilities. Investors who once seemed eager to risk their money on Brazilian power plants or African sewers are pulling back. Commercial banks' power-project financing in the developing world and former Eastern bloc nations, which peaked at \$25.9 billion in 1998, totaled just \$5.7 billion last year, according to Dealogic, a British data firm. Consumers, feeling deceived, increasingly associate privatization with higher rates for them and higher profits for foreign companies and corrupt officials. The unexpected turn of events has left privatization enthusiasts at the World Bank wondering what went wrong.

Source: Michael M. Phillips, *The Wall Street Journal*, 21 July 2003.

Thus there is an urgent need to analyze the successes and failures associated with past reforms and to identify the instruments and policies that should guide ongoing and future efforts. The agenda proposed in this chapter focuses on the efficiency and distributional effects of restructuring and privatization programs and on several second generation regulatory reforms—of pricing, access to bottleneck facilities, and subsidies—that will be needed if such programs are to achieve their public interest goals (Jacobs 1999).

Assessing Reform's Effects on Performance and Distribution

A LOT OF WORK HAS BEEN DONE ON THE ECONOMIC AND social impacts of infrastructure reform in developing and transition economies. But except in Latin America, brief reform histories impede empirical analysis of the performance of restructured and privatized industries. Expanding pre- and post-reform analysis will require systematically collecting cross-country data (box 6.2), defining

Box 6.2 The Need for Data on Infrastructure Reform

EXTENSIVE INFORMATION IS REQUIRED TO EMPIRICALLY ANALYZE the links between specific policy reforms and infrastructure performance. Cross-country and time-series data are needed on measures of market structure (industry concentration, vertical and horizontal integration, ownership structure), conduct and performance (profits, prices, productivity, investment, quality of service, coverage ratios), and numerous governance and institutional variables (regulatory independence, discretion, and budget, structure of regulatory agencies, market structure regulation, method of controlling prices).

Because comprehensive data on these basic economic variables are not currently available, it is imperative that a systematic cross-country data collection effort be undertaken. International financial institutions have collected a lot of useful data in the context of their infrastructure activities. At times these institutions have imposed conditions on their loans to promote better infrastructure performance, and have periodically tried to review experiences and outcomes. Thus they have some of the needed data. A systematic collation of these data, coupled with collection of additional variables noted above, could help overcome critical knowledge deficiencies.

and constructing basic economic measures for various aspects of reform and industry performance, and determining appropriate techniques for econometric estimation.

Structural Options and Post-Reform Performance

Many options are available to countries with strong political commitment to reforming publicly owned network utilities. Much of the debate on how to restructure and privatize such utilities focuses on industrial structure. Accordingly, policymakers and government advisers pay a lot of attention to questions such as:

- Should all assets—such as generation, transmission, and distribution networks in electricity, or rolling stock, track, and stations in railroads—be privatized? Or should private ownership be limited to segments where competitive markets are feasible?

- Should competition be pursued in small markets?
- What is the optimal degree of vertical integration between various stages of production (for example, between generation, transmission, and distribution in electricity)—bearing in mind that investments or operational decisions in one area can influence operational efficiency in others?
- Similarly, to the extent that investment and operational coordination is needed between and within regions (as with electricity), what is the optimal degree of horizontal fragmentation?

Despite this analysis and debate, there is not sufficient evidence that in a given utility a certain structural configuration is more likely to attract long-term private investment and improve performance. Thus, far more before and after analysis is needed to clarify the relationship between structural reform and industry performance. Such analysis should take into account numerous country and sector characteristics—particularly the industry’s regulatory framework. Preliminary findings indicate that successful restructuring is associated with the extent to which regulation enables asset owners to resolve disputes independently and earn a fair return on their investments.

Indeed, because no organizational structure is obviously superior, some analysts believe that what Levy and Spiller (1996) call “regulatory governance” is more important than industrial structure when it comes to attracting long-term private investment and improving performance. According to this view, successful reform requires first establishing credible regulation, and only then refining the industry’s structure.

Sequencing strategies. Among the first considerations for any reform program is whether there is a logical sequence for reforms—and if there is, whether it is costly to undertake them out of order. Early reforms should address the most important problems and, if possible, build momentum for future reforms and minimize risks of failure and policy reversal. Reversible and less risky reforms can be undertaken more readily than irreversible (or costly to reverse) and more risky reforms. Some irreversible reforms can have the advantage of establishing commitment to future changes, and privatization is often seen as one such reform. But irreversible reforms require more careful design and assessment.

Evidence is emerging on what constitute robust, self-sustaining, and desirable reform strategies and what strategies are risky and may lead to undesirable outcomes. Privatization is reversible only at high external cost (diminished reputation among foreign investors), and poorly designed privatization can complicate subsequent reforms. Structural choices, such as the degree of vertical or horizontal integration, can also be costly or difficult to reverse.

Next steps. Several factors may explain the varying performance of restructured and privatized network utilities: the industrial structure adopted, the extent of market liberalization, the speed and sequencing of reforms, the quality of regulatory governance, and the interaction between market rules and structure. To get a better sense of how these factors contribute to cross-country variations in utility performance, there is a need for more empirical assessments of different structural configurations and unbundling schemes, changes in ownership and regulatory governance, market designs and rules, and regimes governing access to bottleneck facilities. By pooling cross-country and time-series data and examining different approaches to liberalization, regulation, and privatization, future empirical studies should seek to identify and disentangle the effects of initial conditions, policy design variables, and other country characteristics. Thus future studies should shed light on both basic questions and contentious issues such as:

- The proper scope, pace, and sequencing for reforms—for example, whether restructuring should occur before privatization, whether restructuring coupled with corporatization and the creation of regulatory institutions but without privatization is viable, what political conditions require slow progress through the various stages, and what conditions permit a compressed schedule—and how costly it is to undertake reforms in the wrong order.
- How to improve incentives for efficiency in operations while maintaining incentives for (and the ability to finance) efficient expansion, and whether the presence of coordination economies implies that vertical separation will undermine the ability to undertake investments based on long-term systemwide planning in each utility.
- How to ensure that the gains from improved efficiency are shared with consumers.

- Whether there are significant gains from restructuring moderately well-run utilities.
- How market rules, and regulatory, ownership, and restructuring choices affect pricing (level, structure, and volatility) and operating efficiency.
- What is the minimal set of regulations needed under ideal circumstances and how this set should be expanded in response to equity concerns, consumer protection, and other social goals.

By assessing how regulation, market design, and industry structure affect performance, future studies could provide valuable guidance to policymakers in developing and transition economies seeking to strengthen incentives for efficient operation of network utilities. In particular, for each feasible option these studies could discuss a relevant role model and examples close to the recipient country's initial conditions, questions to ask, problems that may arise (including unintended consequences of reforms) and how hard they are to fix, regulatory and institutional requirements, sequencing options, and the costs and benefits of competitive restructuring, deregulation, and privatization.

Distributive Impacts of Infrastructure Reforms

Most evaluations of infrastructure restructuring and privatization have focused on operating and financial performance—labor productivity, service quality, investment and network expansion, profitability, and market valuation. But increased efficiency and profitability might come at the expense of workers, customers, and other groups as a result of higher prices, reduced levels and worsened terms of employment, and lower-quality services. Thus a comprehensive welfare assessment of infrastructure reforms must consider their effects on these groups. In particular, it is important to analyze how reform-induced changes in service prices, quality, and access affect the welfare of households in different expenditure categories, and how reform-induced changes affect employment, wages, and earnings inequality. Such an assessment requires systematic household income, expenditure, and employment surveys (McKenzie and Mookherjee 2003).

One of the most serious defects of infrastructure policy during the pre-reform era was its failure to expand services to poor areas, both rural and urban. As a result most of the world's poor people had no ac-

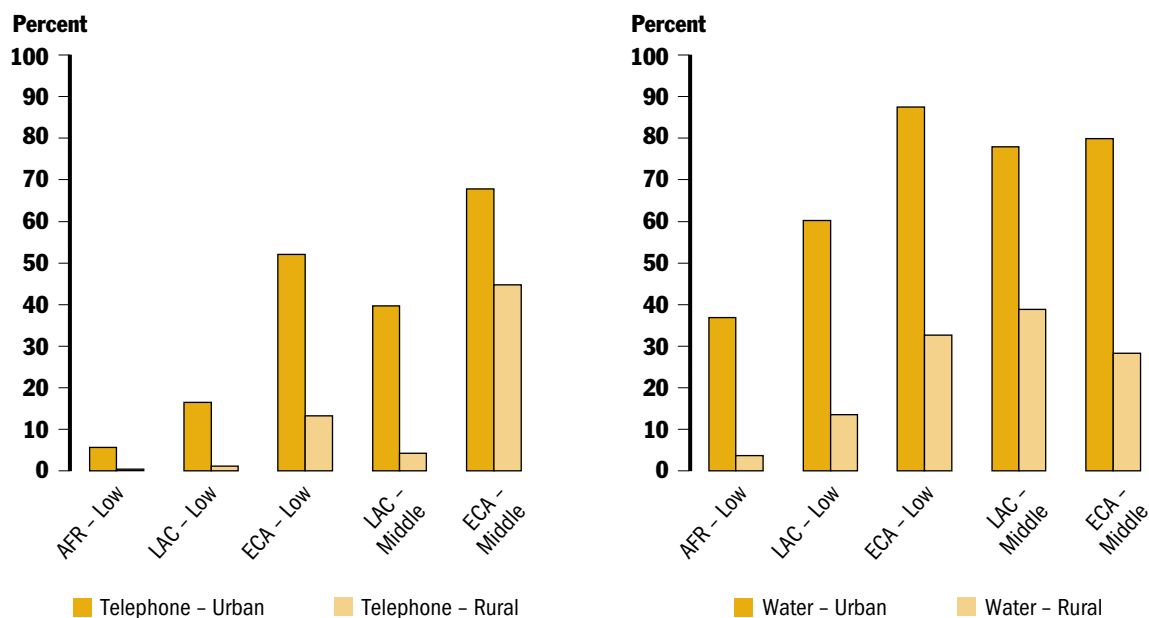
cess to basic infrastructure services, or very limited access and very poor quality. Thus any welfare assessment should also analyze how restructuring and privatization affect service expansion and improvements for poor households.

Promoting access to poor households. In recent years there have been growing concerns about how privatization and market liberalization have affected low-income households in developing and transition economies (Estache, Foster, and Wodon 2002). Some observers are concerned that competition will make the traditional method of financing access for low-income households—cross-subsidies from higher-income customers—difficult if not impossible. The fear is that new service providers entering the market will target only the most profitable customers, eroding the profits that incumbent enterprises used to subsidize service for low-income groups and high-cost areas. So, even if privatization and competition result in service expansion and lower average tariffs, poor households might end up paying higher prices and governments might need to find new sources of financing for universal access—a difficult task in developing and transition economies due to inefficient and distorted tax systems.

Low service coverage among low-income households in urban or periurban areas of informal settlement, slums, and rural areas in most developing economies indicates that public monopolies have failed to achieve universal access (figure 6.1). But it is not clear that privatization and liberalization will automatically benefit these households. Although public monopolies are often overstaffed, inefficient, and lack the resources needed to expand services, governments often heavily subsidize tariffs. Moreover, many utilities subsidize certain customers and services—though these funds do not always reach poor people (see chapters 1 and 5). Thus the impact that reform has on coverage will depend on how it influences incentives for investment and prices for poor customers.

The limited data on how reform affects poor people—drawn from case studies and household surveys—suggest important trends. First, there is little evidence that reform consistently reduces access for poor urban or rural households (Clarke and Wallsten 2002; Foster and Irusta 2003). Even when service prices have increased for these households, the share of poor urban and rural residents with connections has often not fallen, and in many cases has even increased. Further, allowing

Figure 6.1 Telephone and Water Access in Urban and Rural Areas of Developing Regions, 1990s



Note: AFR is Sub-Saharan Africa; LAC is Latin America and the Caribbean; ECA is Europe and Central Asia; Low are low-income countries; Middle are middle-income countries. Income classifications for countries are based upon classifications in World Bank (2002b). Regional averages are computed as simple averages (i.e., no weighting).

Source: Clarke and Wallsten (2002).

competition can dramatically improve infrastructure services for poor people. Competition can allow a range of price and quality options, making service possible to regions and customers that a monopoly provider would never have found profitable.

Still, the impacts of reform vary by country and city. Where coverage is already high among poor households or many poor customers have informal or illegal connections, large price hikes and formalization of customer accounts can reduce coverage among poor households even if overall coverage increases. By contrast, if service was heavily rationed before reform, privatization and liberalization can increase coverage for poor households even if prices rise.

Designing more effective subsidies. Many of the infrastructure subsidies in developing countries are very poorly targeted. As a result poor people and other vulnerable groups capture only a small share of these

Box 6.3 Criteria for Designing Subsidies

SUBSIDY SCHEMES AND REFORMS SHOULD BE DESIGNED TO achieve:

- *Effective targeting*—benefits should accrue to the intended beneficiaries, such as poor people or rural populations.
- *Positive net benefits*—subsidies should pass a cost-benefit test.
- *Administrative simplicity*—schemes should have reasonable administrative costs.
- *Transparency*—financial costs and payment channels should be clearly defined and open to public scrutiny.

subsidies (Foster, Pattanayak, and Prokopy 2003). A key reason for this shortcoming is that most poor households in developing countries lack access to basic infrastructure services. In transition economies, where service coverage is much higher, subsidies have done a better job of reaching poor people (Lovei and others 2000).

There is no universally appropriate model for designing subsidies. Every support program must be tailored to national and local characteristics, including the country's stage of development, institutional capacity, and economic conditions and state of public finances. Still, several basic principles should be applied when designing and implementing subsidy reforms (box 6.3).

Effective targeting is arguably the most important consideration—and greatest challenge—in designing and reforming subsidies. A variety of targeted subsidy mechanisms have been devised that rely on observable indicators of poverty: the amount of services consumed, the characteristics of the neighborhood or region (geographic targeting), and the characteristics of the individual household or dwelling (individual targeting). Preliminary analyses suggest that explicit targeting—geographic or individual—performs better than implicit schemes that rely on modifications of the tariff structure (for example, changing the size of the lifeline first block under an increasing block tariff structure). Explicit targeting reduces errors of inclusion (the extent of subsidy leakage to unintended beneficiaries). But it also tends to substantially increase errors of exclusion (the share of intended recipients who do not benefit).

These tradeoffs can be resolved only with reference to the policy goals underlying each subsidy program, and require considerable empirical analysis. Moreover, targeted connection subsidies perform much better than targeted consumption subsidies by reducing both inclusion and exclusion errors. Recovering connection fees through moderate monthly access charges or providing credit to finance connections (or both) might be especially appropriate in countries with underdeveloped capital markets for personal loans (Kebede 2002). Otherwise, high connection fees can preclude low-income households from obtaining infrastructure services, even if such households could afford equivalent monthly payments (World Bank 1992).

Every price subsidy scheme, no matter how well designed, suffers from limitations—such as distortion of relative prices, leakage to untargeted groups, or wasteful consumption—that reduce economic efficiency. The redistribution goals embodied in such schemes can be achieved with less distortion of economic efficiency through targeted income transfers under a broader social safety net. Governments can allow prices to signal their true economic scarcity costs while providing direct subsidies to consumers who cannot afford those prices (Foster, Gomez-Lobo, and Halpern 2000a). But the administrative requirements of direct subsidies may be beyond the capacity of many developing and transition economies. Moreover, there are practical difficulties in designing eligibility criteria. Thus, despite their imperfections, targeted price subsidies might still be preferable.

Next steps. To design pro-poor regulation and more effective subsidies, more consistent and comprehensive household data on consumption, willingness to pay, and various socioeconomic characteristics should be collected and rigorously evaluated (Foster, Gomez-Lobo, and Halpern 2000b). In particular, poor people's demand for services needs to be analyzed more thoroughly—including factors that affect their decision to connect, the role of alternative and informal service providers, and how the presence of alternatives affects household connections.

Understanding poor people's willingness to pay and their demand for services is critical to assessing the effects of reform and expanding access. For example, data constraints prevent policy analysis from determining whether households remain unconnected because they are unwilling to pay for service in the presence of (perhaps informal) alter-

natives, or whether those alternatives exist because households cannot afford to connect or the utility does not provide service in the area. Knowing the reasons for nonconnection is crucial for developing policies that enhance access and for designing subsidies that extend services to poor and rural customers.

The performance of alternate subsidy mechanisms in terms of targeting, extent of pricing and other economic distortions, extent of service expansion to poor households, administrative costs, and other criteria (see box 6.3) requires rigorous empirical assessment. In particular, the relative merits of consumption, connection, and direct subsidies need to be empirically analyzed to evaluate their appropriateness in different country and industry environments.

Pricing Reform—Balancing Efficiency and Equity

SUCCESSFUL RESTRUCTURING AND PRIVATIZATION REQUIRE pricing policies that provide signals and incentives for efficiency by customers, suppliers, and investors. Yet in many developing and transition economies pricing continues to undermine economic efficiency (World Bank 1994b). Prices are often still set by ministries with mandates to establish price controls that support macroeconomic goals (Bruce, Kessides, and Kneifel 1999). So, in addition to adopting privatization timetables and establishing regulatory institutions, developing and transition economies must rebalance and regulate prices as part of second generation reforms (see chapter 1).

Some deviations from optimal pricing are due to political and social constraints: noneconomic and equity considerations inevitably influence efforts to implement economically efficient pricing (Kahn 1988; Dinar 2000). Indeed, inefficient pricing is often the outcome—and instrument—of a complex system of cross-subsidies under the broad domain of social policy. But deviations are also due to lack of appreciation for alternative pricing schemes that could better balance economic efficiency and social equity. In particular, price differentiation and competitive pricing flexibility—potentially valuable tools for achieving adequate revenue and expanding service to poor people—have not been sufficiently exploited in developing and transition economies.

Policy solutions consistent with both economic efficiency and social equity are not always available or politically feasible. Accordingly, price

reform is among the most challenging tasks for policymakers in developing and transition economies (Kessides 1997; Newbery 2000b, 2000c, 2000d, 2000e; Noll 2000d). It is also a policy area where replicating approaches in industrial countries will likely prove extremely problematic, and where technical assistance from multilateral organizations and other external advisers has been highly unsatisfactory.

As a first step developing and transition economies should examine differentiated, nonlinear, and other pricing schemes that could ease the transition to cost-reflective, competitive prices. The emphasis should not be on setting “optimal” tariffs but on reforming tariffs—to find feasible changes in tariff structures that both improve welfare and generate adequate revenue (Armstrong and Rees 2000). Even optimal prices, if instituted extremely quickly and without enough notice, can lead to a damaging and costly transition (Baumol 1995). Moreover, customers without viable alternatives will suffer the most. Thus policymakers should plan early for a smooth transition to cost-reflective prices (Monson and Rohlf 1993). This point has been ignored in some restructuring and privatization programs, creating public disenchantment with reform and a danger of policy reversal.

Pricing Issues in Developing and Transition Economies

The main pricing issues for policymakers in developing and transition economies are inadequate revenue and unsustainable social pricing.

Inadequate revenue. Inefficient pricing was one of the main reasons for the deteriorating performance of infrastructure sectors in developing and transition economies prior to the reform era. Although inefficient pricing was also a problem in industrial countries, their less developed counterparts were less able to afford the costs of misallocated resources and inefficient production. The failure of many governments to prescribe cost-reflective tariffs hindered service expansion and decapitalized network utilities. Service quality suffered, and the inability to provide better and more varied services constrained domestic growth and hampered international competitiveness. This problem was particularly pronounced in telecommunications but also serious in electricity and transportation.

Unsustainable social pricing. Because the demand for many infrastructure services is highly price and income inelastic, their pricing has important distributional implications. Subsidizing basic services such as electricity and water appears politically attractive because it can approximate a lump-sum grant based on the number of household members. Conversely, raising the price of basic services appears like a lump-sum tax that bears heavily on the poor, the elderly, and those with large families (Newbery 2000a). Not surprisingly, moves toward cost-reflective tariffs often encounter strong political obstacles.

Thus past infrastructure policies have resulted in prices with systematic cross-subsidies (Kahn 1984; World Bank 1994b). The publicly articulated rationale is that such policies foster social goals (helping customers who would otherwise be disadvantaged) and economic externalities associated with universal service. But economic theory and regulatory experience suggest that it is impossible to maintain significant cross-subsidies in the structure of prices for long, with open entry and no remedial policies, regardless of whether that seems desirable (box 6.4).

Box 6.4 Picking Apart Cross-Subsidies

TO USE THIS TERM RIGOROUSLY, A CUSTOMER SERVICE that is priced above its stand-alone cost provides a cross-subsidy to another customer service that is priced below its incremental cost. Economic logic teaches that prices with cross-subsidies are unsustainable in an environment of open entry, and that such competition predictably leads to inefficiencies. The reason is simple—entrants will be impelled by the profit motive to divert the overpriced business, regardless of these entrants' efficiency, while entrants are unlikely to relieve the incumbent service provider from the financial burden of serving customers whose prices do not compensate the costs required to serve them. Thus, even suppliers with inefficiently high costs may find entry profitable in reaction to pricing that has the mandate of providing a flow of cross subsidies. Entry of this

kind not only raises industry costs, but it also erodes the very ability to finance the subsidies that motivate the policy.

The other side of the cross-subsidization coin is the set of prices that lie below their services' incremental costs. While these prices convey the subsidies that motivate the policy, they also discourage the competitive entry of alternative suppliers who would contribute to industry efficiency. An entrant might have incremental costs of providing services that are lower than the incremental costs of the incumbent service provider, but are greater than the level of the cross-subsidized prices. Such a supplier might enter and enhance consumer welfare in an undistorted competitive environment, and yet find it financially unrewarding to enter in the face of cross-subsidies.

Source: Willig (1994a).

So, policymakers in developing and transition economies suffer from a seemingly irreconcilable dilemma. Social development goals and political pressures have led them to set infrastructure prices with significant cross-subsidies. Yet in recent years these policymakers have sought to restructure, liberalize, and privatize their infrastructure sectors. These two goals are incompatible (Baumol 1999), because competitive entry will destroy the cross-subsidies.

Possible solution—competitive pricing flexibility. How can countries achieve adequate revenue while protecting disadvantaged groups? Economics offers well-established principles and insights from both theory and regulatory experience around the world.

Uniform pricing and regulatory prohibition of price differentiation can seriously undermine revenue adequacy by limiting the ability of infrastructure operators to exploit demand characteristics and extract more revenue from high-value customers. As an alternative, demand-differentiated pricing can alleviate the need for radical tariff rebalancing. If an economy is to benefit from market liberalization, infrastructure entities must be allowed to compete with flexible prices and terms. Prices will best serve the public interest if they are allowed to vary among classes of users in accordance with the value of service and in response to the marginal costs of service. The need to set some prices low to retain business means that other prices should be allowed to be higher to secure adequate revenue.

In telecommunications, for example, policymakers should permit the rapid installation of new telephone lines—wired or wireless—based on prices that reflect differences in the value of service and clear service backlogs. In addition, customers who place more value on a service should contribute more revenue to cover unattributable, fixed, and common costs. By offering discounts with nonlinear prices to noncaptive customers, the utility will be able to recover the costs of the local loop with marginal access prices much closer to incremental costs and keep all customers in the network, benefiting all.

Next steps. The priority for action, involving both applied research and detailed policy analysis, is to develop practical, flexible, differentiated pricing rules for infrastructure services that balance economic effi-

ciency and social equity. This agenda will also entail creating a cross-country database on infrastructure prices and regulations that permits emerging regulators to draw on international benchmarks.

Reform programs in several countries have been criticized as excessively increasing prices and hurting poor people, yet reform is essential to achieving development goals—including poverty reduction. Pricing is an area of policy where practical research is needed to aid the real-time design and application of better—second best, but workable—reforms. This applied research should draw on the theoretical literature on competitive pricing flexibility and nonlinear pricing to design transitional approaches that allow cost-reflective prices in restructured and privatized network utilities, taking into account regulatory and information constraints and perceptions of social fairness.

A Practical Pricing Regime

Data shortcomings are a key obstacle to economically efficient pricing regulation. And because of weak auditing and inadequately trained regulators, information problems are likely to be especially severe in developing and transition economies (Beato and Laffont 2002). In particular, information is generally unobtainable on demand elasticities and other attributes of demand.

Constrained market pricing. Constrained market pricing offers a promising solution to this dilemma (ICC 1985). This approach divides the setting of product prices into two stages. In the first stage the regulator imposes floors and ceilings on the prices of the regulated firm. These limits can be determined solely with the aid of information on costs. The second stage of price setting is left to the firm, which will be driven by self-interest to take into account demand conditions. The firm is prohibited from setting prices that violate the limits imposed by the regulator but is free to select prices that best promote its interests.

Regulated ceiling and floor prices are derived from the competitive market model. Thus the firm cannot adopt a price higher than what an efficient entrant (rival) could afford to charge for the product in a competitive market where inputs are available on competitive terms. This price ceiling is the stand-alone cost of the product or service (see exec-

utive summary, endnote 4). A price constrained not to exceed the stand-alone cost ensures that customers pay no more than they would have if the item had been sold in an effectively competitive (contestable) market. The floor price reflects the product's marginal or average incremental cost. This approach, in essence, seeks to enforce competitive behavior where such behavior is not the automatic result of market conditions (Baumol and Willig 1988).

The main purpose of the stand-alone cost ceiling, aside from its role in eliciting economic efficiency, is to protect consumers from monopolistic exploitation by the regulated firm. Similarly, the main purpose of the floor price, economic efficiency aside, is to protect actual or prospective rivals of the regulated firm from predatory pricing and related practices that can handicap these competitors or drive them from the field.

The application of differentiated pricing in developing and transition economies, when it has even been considered, has often been dismissed as being too difficult and contrary to social equity. But it is possible, and indeed imperative, for such a pricing approach to be made practical in infrastructure sectors facing chronic revenue inadequacy, underinvestment, and low coverage. Differentiated pricing rules should be considered a source of qualitative guidance rather than a generator of precise, definitive pricing prescriptions. Price differentiation can do much more to alleviate revenue inadequacy than can standard uniform price rebalancing schemes (such as across the board price hikes), and can provide greater potential for social equity than unsustainable internal cross-subsidies under uniform prices.

Next steps. Stand-alone and incremental costs will have to be calculated if constrained market pricing is to be used to help determine the reasonableness of utility rates. Given the likely difficulties of estimating these costs in developing and transition economies, international benchmarking should be carefully considered. At the least, the potential applicability of software developed to estimate stand-alone costs, especially in the United States, should be examined. Moreover, there is a need to assess whether the ceilings on pricing imposed by constrained market pricing sufficiently address concerns about higher prices for poor consumers. Further empirical evidence is required to address these concerns.

Facilitating Access to Bottleneck Facilities

UTILITY RESTRUCTURING REQUIRES POLICYMAKERS IN developing and transition economies to address a difficult new issue. As a part of restructuring, potential competitors often require access to essential (bottleneck) network facilities. Thus the removal of legal barriers to competitive entry is not sufficient to ensure effective competition in infrastructure. Competitors must also have access to bottleneck facilities on nondiscriminatory terms if they are to have a reasonable opportunity to compete. Explicit regulatory intervention may be required to ensure such access, particularly if these facilities are controlled by the incumbent infrastructure operators, who will often have business incentives to deny rivals fair access.

Emerging experience from several countries indicates that the allocation of bottleneck facilities and the broad issues of access and interconnection are extremely important in infrastructure deregulation and competitive restructuring. Regulators must identify appropriate terms and scope for sharing these facilities. The benefits of liberalizing the potentially competitive segments of infrastructure industries will not obtain without a proper framework for access and interconnection (Armstrong and Doyle 1995; Valetti and Estache 1998; Kessides, Ordovery, and Willig 1999).

Regulators in developing and transition economies must ensure that competitors have access to bottleneck facilities on terms consistent with efficient competition—setting a level and structure of access prices that promote dynamic efficiency through entry and investment decisions while enabling the owner of the network to remain financially solvent. Prices should be high enough to be compensatory (at least covering the long-run incremental cost of the entrant's use of the network), yet not so high as to preclude efficient operations by the entrant.

The access problem is especially vexing when competitors require a bottleneck input controlled by one of their rivals. Monopoly control of bottleneck facilities can create powerful incentives to behave anticompetitively and cross-subsidize unregulated competitive activities from regulated monopoly ones. Without regulatory constraint, the holder of the bottleneck monopoly can repress competition by creating artificial handicaps for its rivals for the final products sold to consumers. The monopolist can impose costs on its competitors by impeding their access to the bottleneck, thereby raising the prices that they must charge to cover their elevated costs and so weakening their ability to compete.

Access and interconnection rules are one of the central regulatory tasks for network utilities

Two Approaches

The economic literature offers two ways to price bottleneck facilities efficiently: the Baumol-Willig efficient component pricing rule, or parity pricing, and the Laffont-Tirole global price cap rule (Baumol, Ordover, and Willig 1997; Laffont and Tirole 1994, 1996). Under efficient component pricing the holder of the bottleneck facility should charge as much for its services as it would earn from providing them itself. This approach is consistent with efficient competition—it ensures that responsibility for supplying contested services is distributed among actual and potential rivals in a way that minimizes total costs. But it does not permit competition to fulfill other important functions of eliminating allocative inefficiency and eroding monopoly profits. Thus regulation must determine how large a markup of the retail price above marginal cost is economically efficient and what level of contribution should then be included in access charges. This requirement is likely to be violated in developing and transition economies with deficient regulation, where regulated price structures are often inefficient.

The Laffont-Tirole rule recognizes that the profit of the integrated incumbent is an increasing function of both the access charge and the final retail price. Under a breakeven constraint a higher access charge would permit the regulated firm to lower its final price. A regulator concerned with consumer welfare would take this tradeoff explicitly into account. The socially optimal access charge will depend on the benefits of reducing the retail price (which will depend on the elasticity of demand) and the effects on productive inefficiency of raising the access charge (which will depend on entrants' elasticity of supply).

Despite their internal consistency and powerful theoretical results, translating either approach into workable rules and actual access prices has been proven extraordinarily difficult and contentious. The first approach suffers from restrictive assumptions that limit its applied policy content. Indeed, the case for adopting the efficient component pricing rule is not so unequivocal if allocative and dynamic efficiency are important issues, as is likely in many developing and transition economies—that is, when even inefficient competition could make a substantial contribution to allocative efficiency and to increased efficiency and service innovation (Kahn and Taylor 1994). The Laffont-Tirole rule has substantial information requirements (demand and supply elas-

ticities are hard to estimate). Thus it is challenging to translate it into operational rules than can be applied in real world settings.

Next Steps

An important policy priority in the restructured utilities of developing and transition economies is developing regulation for network access that has realistic prospects of being implemented effectively. There is an urgent need to translate the principles and results of theoretical and analytic work on access into workable rules and procedures, especially in the face of severe problems measuring relevant economic variables. One promising direction for applied policy analysis is to build on the powerful insights of the efficient component pricing rule and the Laffont-Tirole price cap rule, and develop a hybrid model that combines the two approaches with the objective of promoting productive and allocative efficiency. Moreover, in developing and transition economies it is imperative to identify the conditions, if any, under which it is appropriate to use access pricing as an instrument to promote supplementary goals (such as expanding service to poor people) that go beyond attainment of economic efficiency.