Education

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Contracting for public services

Output-based aid and its applications

Edited by Penelope J. Brook and Suzanne M. Smith

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Foreword

Access to good, reliable public services is critical for the poor in developing countries if they are to rise out of poverty. Safe water and sanitation, modern energy and communications, good-quality basic education and health services—all contribute directly to individual well-being, and all improve economic opportunities for low-income households.

This is not news. In recent decades developing country governments and bilateral and multilateral donors have focused massive efforts on improving infrastructure and social services. But these efforts have all too often ended in frustration—with investments in capital works failing to produce sustained flows of reliable services, and with subsidized service provision failing to translate into improved access for the poorest.

The primary challenge now is to ensure that aid- and tax-funded spending reaches the poor, that the services this money finances respond to their needs and preferences, that these services are delivered efficiently, and that public funds are used in a way that leverages private financing of service delivery.

For developing countries the stakes are high. Better delivery of services is critical to the well-being and economic potential of their citizens—and to economic growth more generally. Better use of the funds spent on public services is critical to fiscal viability. Governments seeking to recover from indebtedness, and to avoid it in the future, need to ensure that projects increase productivity and are financially sustainable. Better delivery of public services is also critical to improving governance. Governments that can run efficient, transparently financed programs for delivering public services reinforce their credibility with their own citizens and with the international community—both private companies that might invest in

service expansion and donors wearied by skepticism about the effectiveness of aid.

The cases gathered in this book tell of efforts to improve the delivery of services by contracting out their provision and linking the payment of subsidies to the delivery of services to targeted groups—illustrating aspects of an approach that we call "output-based aid." The cases highlight varied attempts to sharpen the focus on the objectives of aid and public spending, to improve incentives for efficiency and innovation, to expand opportunities for mobilizing private financing to meet social objectives, and to enhance accountability in the use of public resources. It is our hope that these cases, and the checklist on designing output-based aid schemes, will help advance the debate on how to improve service delivery to the poor in developing countries and afford practical insights for all those committed to this goal.

Michael Klein
Director, Private Sector Advisory Services
The World Bank

Part 1

Part 2

Part 3

Output-based aid: precedents, promises, and challenges

Penelope J. Brook and Murray Petrie

More efficient delivery of infrastructure and social services in developing countries, and better targeting of these services to those most in need, are critical to alleviating poverty and developing economic opportunities for the poor. Traditional approaches to aid and public spending have often failed to yield sustained improvements in services, particularly for the poorest. Thus an important question for developing countries and for the international development community is how to deliver and target public services in ways that promote efficiency and innovation, increase accountability for performance, and—in a world of limited budgets—leverage public resources with private financing. This is the question to which "output-based aid" schemes, the focus of this book, seek to provide at least a partial answer.

Governments in both developed and developing countries have introduced a variety of reforms in recent years to improve the delivery of public services. These reforms have included using "quasi-contracts" between government agencies, commercializing public agencies, contracting out specific services to the private sector, and transferring responsibility for providing services to the private sector through concessions or outright privatization. In contrast with more traditional approaches, these schemes seek to define objectives and specify expected performance in terms of outputs (or in some cases outcomes) rather than focusing on inputs.[1]

Experience with such schemes provides important insights into both the promise and the challenges of using output-based approaches to improve the delivery of services and to better target government and donor funds. Of particular relevance is experience with performance-based contracting within the public sector and with engagement of the private sector for the delivery of infrastructure services.

Performance contracting is generally used to increase the efficiency of service delivery for core government activities where market failures weigh against market provision. The arrangements take a variety of forms, involving both quasi-contracts between public agencies and enforceable contracts with

parties outside the public sector. Through clear identification of public policy objectives and careful specification of expected performance, performance contracts have the potential to introduce strong incentives and competitive disciplines for the delivery of desired service outcomes.

Experience in OECD countries points to significant benefits from public sector performance contracting: lower costs, better quality of service, greater innovation and responsiveness, and a sharper focus on core government responsibilities. (Quantifying these benefits has been difficult, however, because information on performance before the reform is typically limited, and the contributions of different factors to the outcomes cannot always be identified.) But the OECD experience also demonstrates the challenges involved in setting clear, meaningful performance targets, designing incentive systems aligned with those targets, and evaluating performance. Moreover, preparing and managing performance contracts can involve substantial up-front costs, particularly for pioneering schemes with no precedents (OECD 1999).

Schemes for *private participation in infrastructure,* aimed at mobilizing private incentives for efficiency and innovation in service delivery, have expanded dramatically in the past decade, with generally positive results. Across a wide range of countries and sectors, reforms that transfer significant commercial risk to the private sector have typically improved efficiency in delivering services and expanded their availability.[2]

Analyses comparing the actual effects of reforms with reasonable counterfactuals show that in most cases private sector reforms have yielded significant welfare gains—even in countries starting out with weak institutions. But they also suggest that the benefits of private participation and its effects on distribution are sensitive to the design of contracts and the related market structure and regulatory reforms.[3] Time and again, sound contract design, attention to facilitating competition, transparent project procurement, regulatory independence and accountability, and sound strategies for allocating and mitigating risk have proved to be essential for sustainable, beneficial projects.

Drawing on experience to improve the delivery of aid

Output-based aid draws on the experience and tools of public sector performance contracting and private infrastructure schemes. Service delivery is delegated to third-party providers under contracts designed to provide incentives for efficient, well-targeted service delivery, in part by tying a significant part of the compensation to delivery of specified outputs or results.

Public funds from external donors or domestic tax revenues may complement user fees—or serve as proxies for user fees for services that are largely public in nature.

Output-based aid extends some of the core features of traditional government contracting and private infrastructure reforms. It goes beyond contracting by mobilizing commercial financing of service provision. And it differs from many private infrastructure schemes by complementing user fees with carefully targeted subsidy payments. Both these characteristics increase the potential for mobilizing private funding for critical public services while ensuring a high level of accountability for the use of public funds.

Many developing countries—and many organizations in these countries—have adopted aid schemes with output-based elements:

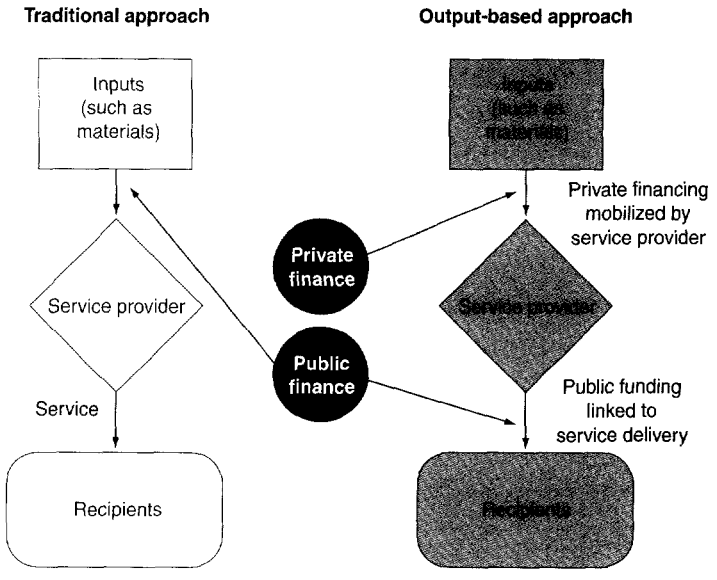
- In Chile subsidies for water services to low-income households flow to providers only when a qualifying household has received the service and paid its share of the bill (see chapter 2). Guinea has also used an output-based subsidy scheme for water: an International Development Association credit was used to ease the transition to cost-covering tariffs (see chapter 3).
- In Haiti and Romania primary health care providers in rural areas receive compensation based on their delivery of defined basic services, with an emphasis on preventive care (see chapters 7 and 8).
- In Peru telecommunications companies compete to expand and sustain services in rural areas on the basis of the smallest subsidy required (see chapter 1).

These examples stand in stark contrast to aid projects focusing on financing facilities (building a health clinic, a telecommunications network, or a water treatment and distribution system) or other inputs (such as books and medicines; figure 1). They also stand in contrast to traditional public delivery of services in many developing countries, which too often has produced disappointing results in terms of both efficiency and access.

Designing output-based aid schemes: the challenges

In designing output-based aid schemes, the overarching goal is to ensure that they channel public funds in a way that provides incentives for improving the delivery of services to the intended recipients. That requires designing schemes that help mobilize commercial funding of service providers, that expand nongovernmental supply capacity, and that ensure accountability for results. It is also important to design schemes in ways that build and reinforce

FIGURE 1 Traditional and output-based approaches to service delivery



good governance, particularly in awarding and monitoring contracts, and that ensure cost-effective administration.

There are many ways to design such schemes, and the approach that is most appropriate will vary across sectors and countries. (For a detailed discussion of the issues to be addressed and the factors driving key design decisions see the checklist in part 3.)

Defining intended results

Clear definition of the intended results is one of the hallmarks of output-based schemes. This involves deciding who the recipients should be—all consumers, or only those meeting certain eligibility requirements?—and what the service should be.

In an ideal world schemes would focus on broadly defined outcomes, such as well-educated children or households with adequate access to potable water. In practice, however, developing effective contracts requires much more precision, and contracts need to account for the fact that some factors affecting outcomes will be beyond the contractor's control. Contracts usually need to focus on specific outputs—such as an education

service or household connections to a water system—that meet specified requirements. Correctly identifying indicators for these outputs is critical: misspecified or incomplete indicators can lead to counterproductive or biased behavior by service providers. In some cases defining and verifying an acceptable level of quality for even specifically identified outputs may be so difficult that the contract will also have to address inputs, such as the choice of technology, the quality of the materials, or the qualifications or reputation of the service provider. Even so, schemes that can focus primarily on outputs or outcomes offer the greatest promise, as they create opportunities and incentives for contractors to discover new and better ways of achieving the intended results.

Defining the service to be delivered often involves tradeoffs between price and quality. Some schemes can be designed to allow intended recipients to choose a bundle of services based on their preferences and ability to pay. Others will need to nail down such choices in the design of contracts. In these schemes especially there will be benefits from getting the input of the intended recipients on the design of services and possibly from using different approaches in different areas, to match local preferences and circumstances.

The definition of the subsidized service also needs to take into account budgetary constraints and the sustainability of the subsidies. These considerations may lead to a narrower definition of eligible recipients or to a decision to direct public funds to the one-time costs of service connection—typically the main impediment to expanded access to services—rather than the ongoing costs of consumption.

Choosing the environment for service delivery

A basic design choice is whether to provide the service in a competitive market or through monopolistic supply arrangements. For many services, schemes can use vouchers or similar instruments to give consumers choice over their service provider, creating incentives for efficiency and responsiveness to clients.

For other services, concerns about potential market failures or subdued supply response might lead to a decision to grant a monopoly in a particular area. This choice requires decisions about how long the monopoly should last, how far it should extend, and how best to ensure that the service provider faces incentives for efficiency. Competitive bidding for time-bound concessions can provide a useful discipline over such suppliers and may also help in gauging the level of public funding required.

Deciding which service providers are eligible

Experience with public sector contracting schemes and with infrastructure reforms reinforces the importance of ensuring that service providers are in a position to respond to incentives and that they operate at arm's length from regulators and the funding source. Providers under output-based schemes need to pass the same tests. Most public agencies fail both.

That does not mean that output-based schemes should be limited to the international private sector. Depending on the service, small-scale local entrepreneurs could be important suppliers—and so could community groups or nongovernmental organizations. When considering whether to include these groups, however, an additional concern might be whether it is possible to establish a "level playing field" between suppliers, so as to reap the benefits of competition.

Choosing the form, level, and structure of payment

The form, level, and structure of the subsidy payment to service providers are crucial in determining the incentives they face and the possibility of mobilizing private financing. Subsidies usually take the form of cash payments. The level of the payment depends largely on the expected cost of delivering the service, net of expected revenues from other sources, such as user fees. For schemes that involve concessions, one strategy for determining the appropriate subsidy is to award the concession to the firm willing to provide the service for the smallest amount. In other cases the subsidy might be based on estimates of costs and of recipients' willingness and ability to pay for the service.

Determining the structure of the payment involves two main issues. First, how tightly should payment be linked to performance? Should most of the payment take the form of a fixed fee (which might still be voided if performance falls below some minimum level), or should most be linked directly to performance against specific indicators? Linking pay to performance indicators provides stronger incentives, but increases the risk that the supplier will engage in undesirable behavior (such as cutting costs by reducing quality) where quality is hard to specify and monitor. Second, should the service provider receive some up-front payment (which might be subject to deductions in the case of nonperformance), or should the provider be paid only after satisfactory delivery of services has been verified? Here again, payment linked to performance indicators (in this case, satisfactory delivery of services) provides sharper incentives, but it may need to be adapted if service providers face difficulties in mobilizing financing for service delivery. Hybrid schemes

combining fixed or up-front payment with payment linked to performance indicators are usually feasible only when the service provider has been awarded a monopoly.

Designing effective administration

Designing effective administrative arrangements for output-based schemes requires resolving a host of issues. A threshold question is their scope. Should schemes be established for each narrowly defined sector (rural electrification) or encompass a broad range of services (rural infrastructure)? Should they cover small subnational jurisdictions or have national or even international coverage? And should a separate scheme be established for each funding source, or could schemes pool funding from multiple sources (for example, a portfolio of donor funds)? Broader schemes promise lower administrative costs and may help pool expertise, but they may also be cumbersome and time-consuming to implement.

Once the scope of a scheme is defined, who should be entrusted with management—managing funds, designing and awarding contracts, monitoring and verifying service delivery, and paying the service providers—a private firm, a nongovernmental organization, or a public agency? An important consideration in this choice is which will be most effective in establishing credible arrangements that win the confidence of service providers and funding sources while also helping to develop good governance practices.

Finally, should one entity be responsible for all aspects of the scheme's administration, or should some functions be delegated or contracted to others? In some cases there may be advantages in having regulatory bodies, nongovernmental organizations, or communities monitor and verify the delivery of services. And local microfinance institutions or other intermediaries could play a role in the payment scheme.

Conclusion

Experience with contracting for service delivery, through public sector performance contracting and private infrastructure schemes, suggests cause for both optimism and caution for output-based aid initiatives. The case for optimism: public sector contracting and private infrastructure schemes appear to have improved outcomes and raised welfare, even in countries starting out with weak institutions. The case for caution: there is increasing evidence that the size of the benefits, and the extent to which they reach the poor, depend crucially on the incentives created for service providers—

through the details of contracts, through competitive pressure, and through regulatory oversight.

This book is aimed at stimulating thought and debate about potential applications of output-based aid schemes to improve the delivery of basic services to the poor in developing countries. The cases it presents are not intended to be perfect examples of such schemes. Instead, they illustrate some of the key challenges in channeling tax and donor funds toward specific results and creating incentive structures that ensure efficient achievement of those results—and thus reduce the subsidies needed. Together with the preliminary checklist of design issues that follows these cases, they will, it is hoped, cast light on both good practices and potential pitfalls in contract design and implementation for output-based aid schemes.

Notes

Penelope J. Brook (pbrook@worldbank.org) is program manager of the Rapid Response Unit, Private Sector Advisory Services, World Bank, and Murray Petrie (mpetrie@ihug.co.nz) is a principal with the Economics and Strategy Group, in New Zealand. The authors wish to thank Warrick Smith for his comments and advice.

1. Inputs are the resources—such as employee time, buildings, and equipment—used to produce goods and services. Outputs are the goods and services themselves, such as drinking water supplied or health services delivered. And outcomes are the consequences for consumers or the community resulting from the outputs supplied—such as an increase in productive time as a result of improved access to potable water, or a reduction in disease as a result of effective preventive health care.

2. The long time horizons of large-scale infrastructure projects, however, mean that full evaluations are possible only after a long period.

3. For a good survey of the theoretical and empirical literature on the impact of privatization, see Shirley and Walsh (2000). For an overview of current data on the distributional effects of these reforms that focuses on Latin America, see Estache, Gómez-Lobo, and Leipziger (2000).

References

Estache, Antonio, Andrés Gómez-Lobo, and Danny Leipziger. 2000. "Utility Privatization and the Needs of the Poor in Latin America: Have We Learned Enough to Get It Right?" Policy Research Working Paper 2407. World Bank, World Bank Institute, Governance, Regulation, and Finance Division; and Latin America and the Caribbean Region, Finance, Private Sector, and Infrastructure Sector Unit, Washington, D.C.

OECD (Organisation for Economic Co-operation and Development). 1999. *Performance Contracting: Lessons from Performance Contracting Case Studies and a Framework for Public Sector Performance Contracting*. PUMA/PAC (99)2. OECD Programme on Public Management and Governance (PUMA). Paris.

Shirley, Mary M., and Patrick Walsh. 2000. "Public versus Private Ownership: The Current State of the Debate." Policy Research Working Paper 2420. World Bank, Development Research Group, Washington, D.C.

Part 3

Part 2

Part 1

Expanding rural telephony

Output-based contracts for pay phones in Peru

Geoffrey Cannock

Geoffrey Cannock (gtc@apoyo1.com.pe) was general manager at Osiptel from 1997 to 2000. He is now project director for a private economic consultancy service in Peru, Apoyo Consultoría. *This case study was funded by the Public-Private Infrastructure Advisory Facility, a multidonor technical assistance program.*

Innovations in technology, combined with pro-competitive reforms, are rapidly expanding access to telecommunications in many developing countries. But extending basic telephone access to the rural poor can remain a stubborn problem. To tackle this problem, Peru is using a "least subsidy" bidding approach. Private telecommunications operators bid for the minimum government subsidy they require to provide pay phone service in targeted rural areas. Part of the subsidy is paid on award, part once the equipment is installed, and the rest in semiannual installments for several years, contingent on compliance with performance standards. Winning bidders get a nonexclusive concession defining their rights and obligations. Early pilot results show that the private investment mobilized is twice the subsidy provided.

Peru began reforming its telecommunications sector in 1992, privatizing the state telecommunications companies, establishing a regulatory authority (Organismo Supervisor de la Inversión Privada en Telecomunicaciones, or Osiptel), and gradually opening the market to competition. These reforms were expected to accelerate growth in service, but to leave high-cost rural areas—home to about 30 percent of Peru's population and 70 percent of its extreme poor—largely excluded from a mostly commercial operation. So in 1992 the government also created a fund (Fondo de Inversión en Telecomunicaciones, or Fitel) with a mandate to improve rural access to telecommunications services by promoting private participation. Fitel's goal was to provide, by 2003, pay phone service in 5,000 rural towns and public access to the Internet in all 554 district capitals.

Fitel's funding is assured by an earmarked 1 percent levy on the gross operating revenues of telecommunications companies. Fitel is legally distinct from Osiptel, but Osiptel provides technical and administrative services to Fitel and approves policies and projects. Osiptel defined the target population as unserved poor rural localities with 500–3,000 inhabitants. Osiptel also conducted policy, market, and engineering studies; set up a geographic information system; and defined the project cycle and procedures, including those for identifying target localities, tendering projects, and monitoring performance against targets.

Deciding on competitive bidding

Osiptel selected potential localities on the basis of expressed local demand and project analysis. The final choices are made during field visits, when local authorities, who have far better knowledge of local trade and transportation patterns, decide which towns should be served. Combining a demand-driven approach with top-down studies, rather than using a pure demand-driven approach, allowed network economies. (The Fitel rule now allows a pure demand-driven approach, since network facilities have been extended to most localities.)

Government officials debated whether to hold just one tender for all towns (to promote economies of scale) or to encourage the entry of several operators to foster competition. The final decision was to partition the country into six regions, each with more than 700 towns, and then hold two tenders.

The winning bidder is granted a nonexclusive 20-year renewable concession. The concession requires the operator to install at least one public pay phone in each rural locality listed in the tender, providing access to local and

long-distance voice and narrow-band data communications, and one point of public access to the Internet in each district capital. The operator is obliged to provide service over the entire 20-year concession, though the subsidy payments extend only over the first five years. The operator may use its facilities to provide additional services to individual subscribers, such as Internet and long-distance telephony. Osiptel expects that the service in rural towns will be fully commercial after five years.

Setting pricing, subsidies, and incentives

Retail prices for rural services are regulated by Osiptel under a price cap regime similar to that in urban areas—though the cost to the operator for rural calls is higher (often because of geographic isolation or extremes in altitude and climate). Interconnection charges, also regulated, should result in a net payment to the rural operator. But since most calls originate in urban areas, the provisional sender-keeps-all agreement between the operators has prevented the entrant rural operator from benefiting from this net payment.

A financial contract between Osiptel and the operator establishes the terms and conditions under which Fitel will provide funds, tying the disbursement of the subsidy to project implementation and service quality: 35 percent is paid at the start of the project, 25 percent once the facilities are installed, and the remaining 40 percent in semiannual installments over five years, subject to compliance with service performance targets. The semiannual installments are reduced by US$1,000 a day for pay phone and network monitoring system outages, and by 10 percent per locality per week of delay in initiating service for up to one month, at which time the balance of the subsidy is canceled.

The financial contract also specifies indicators of performance that are not linked to penalties (though Osiptel can impose penalties for noncompliance): grade of service (network congestion in peak hours), time to get dial tone, and overall quality of service as measured by mean opinion scores. These performance indicators, from International Telecommunication Union recommendations, are readily available and understood by operators.

Osiptel staff supervise project implementation. They use a network management system to oversee system operations (traffic levels, continuity of service) in real time and a required dedicated data circuit in the operator's headquarters to monitor billing, failure reports, and the calls placed and received by the rural pay phones. In a semiannual report Osiptel assesses com-

pliance with performance targets and indicators and makes recommendations on Fitel payments.

Getting started

Osiptel started to collect funds after the privatization in 1994 and had collected enough funds and done enough studies to call for a tender by 1996. But the tenders got off to a slow start. Technically, Fitel had everything to get under way: a clear mandate in the 1992 telecommunications law, strong support from beneficiaries and local authorities, money, technical support, and private operators. But institutional problems and lack of widespread political support at the national level delayed implementation. The 1992 law did not specify policies or procedures, so they had to be designed later by Osiptel, itself a start-up operation. The Fitel model had to compete with different visions of the government's role in delivering assets to the poor, and private interests lobbied against the Fitel mechanism as too transparent. The minister of transportation and communications was reluctant to take political responsibility for approving the projects. The approval process was further hampered by institutional conflicts with Osiptel, high turnover of ministers, and a centralized decisionmaking process.

Still, by March 2001 three competitive tenders had been conducted for six projects covering all 5,000 rural towns due to be connected by 2003. Six bidders competed for a pilot project, and four or more in each of the next two tenders. Winning bidders bid for all regions in the tender. New operators, both foreign and domestic, entered the market.

Reviewing results from the pilot project

For the pilot project, covering 193 localities, the competitive bidding resulted in a much smaller subsidy than expected. The winning bid requested a subsidy 41 percent lower than Osiptel's estimate and 74 percent lower than a previous offer by the incumbent operator. Results from the first year of operations (ending December 2000) are encouraging. Pay phones have typically been located on the premises of a small business or local authority. Retailers provide space and security for the pay phones in return for a percentage of the price of the prepaid cards. In addition, they may charge users for an informal messenger service to alert them to incoming calls. They also benefit because the phones help to cross-sell other products.

The pilot project has reduced the average distance to the nearest pay phone to less than a tenth of what it had been, and nearly doubled the share of the population living in localities with pay phones (table 1). In response

to user needs, the operator introduced service innovations, such as prepaid calling cards, and is providing dedicated Internet access and long-distance services.

The operator met the deadline for initiating service in all 193 localities and also installed additional pay phones and individual telephone lines. Traffic exceeded Osiptel's forecasts by 7 percent in the first six months and 32 percent in the next six. The operator met targets for network management and average service reliability, but failed to meet service reliability targets in five localities. That resulted in a fine of US$27,000, equivalent to 1.6 months' revenue or a sixth of the semiannual subsidy payment.

During the first six months the operator also failed to meet the target for grade of service, failed to supply enough prepaid cards, and had operational problems. Osiptel delayed the first semiannual payment until these problems were corrected. It also postponed the second payment, because the operator failed to act on a minor observation in the first supervision report. If uncorrected, minor observations become major observations in the next review and may delay payments. The delayed payments were equivalent to 1.8 months' revenue. Several performance indicators were not reported because of technical difficulties.

Surveys of users in June and December 2000 showed that a growing number were satisfied with overall service (up from 57 percent to 75 percent) and had access to prepaid cards (up from 35 percent to 50 percent). The surveys also showed modest progress on service outages, hours of service, and customer knowledge of how to use the facilities.

TABLE 1 Access to telephones in the pilot project by department, December 2000

Indicator	Amazonas	Cajamarca	Piura	Tumbes	Total
Rural towns served	57	54	54	28	193
Beneficiaries [a]	39,086	45,359	46,370	13,707	144,522
Distance to the nearest phone (kilometers)					
Without the project	251.4	26.1	26.1	9.0	n.a.
With the project	6.2	4.9	4.2	3.0	n.a.
Penetration (percent) [b]					
Without the project	10.0	20.0	16.0	91.0	48.3
With the project	90.0	85.0	71.0	99.0	88.5

n.a. Not applicable.
a. Includes both direct beneficiaries (inhabitants of the towns served) and indirect beneficiaries (those living within 5 kilometers of the towns served).
b. Share of the population in the project area with telephone access.
Source: Fitel 1998.

Assessing Fitel as a policy instrument

Initial results confirm that Fitel is an effective means for extending telecommunications services to rural populations. Fitel attracts and leverages private participation and investment. And it enhances sustainability by spreading the subsidy over five years, which helps maintain a positive cash flow until revenues build up from growing traffic. The pilot project required a subsidy of only US$11 per inhabitant while mobilizing private investment estimated at US$22 per inhabitant. Subsidy administration costs are low: according to Osiptel's operating plan for 2000, after start-up costs (US$1.7 million) Fitel's administrative costs have averaged less than 2 percent of the funds collected.

Improvements are needed, however, in the links between performance and subsidies. First, performance targets and indicators should evolve over time. Since those used are typical for mature networks rather than start-ups, a one-year grace period without penalties might be appropriate. Targets and indicators should also become more demanding over time, putting pressure on the operators to continually improve service. Second, performance targets should reflect use, not just access. Where call charges are below incremental variable costs—as they may well be, since the regulated rural and urban tariffs are similar despite the higher cost of rural service—the operator has no incentive to encourage traffic growth. Yet much of the benefit for the rural population comes from using the facilities, not just having access to them. Moreover, the business case for investors and equipment suppliers may be determined largely by initial capital outlays and subsidies rather than recurrent costs and revenues. A performance target that ties recurrent subsidies to traffic may better align the interests of operators, pay phone retailers, and the economy. But it would be much more complicated to administer and would require Osiptel to monitor financial results, which it does not now do.

The tariff caps are another problem: there are high policing costs for Osiptel, cost shifting from the operator to the pay phone administrator, and reduced incentives for operators to generate traffic.

Given these three problems, a more effective approach might involve fewer performance targets and regulatory controls, less use of penalties, and more emphasis on customer service. Project supervision, for example, which now not only verifies compliance with concessions, contracts, and performance targets and indicators but also seeks to influence project management, would be focused on a few key parameters and stripped of discretionary powers. This alternative approach would require more collegial relationships between operators, civil society, and Osiptel than envisaged in Fitel's original design.

There are three ongoing challenges: First, the risk that private operators will underbid for subsidies and later default on their commitments, even though Osiptel has required operators to post performance bonds.[1] Second, the need to shift Fitel's support to smaller and less accessible localities as technological innovations and network growth reduce the cost of reaching rural areas and as the private sector becomes increasingly willing to provide services on commercial terms. And third, the exemption of cable television and Internet service providers from the levy, which raises concerns about the fairness and economic efficiency of Fitel's funding.

Note

1. The operators are required to provide three financial guarantees: a guarantee ensuring the seriousness of their offer (to prevent the "winner's curse"), an installation guarantee, and a guarantee against default on their contractual obligations.

Reference

Fitel (Fondo de Inversión en Telecomunicaciones). 1998. *1998 Annual Report.* Lima.

Making water affordable

Output-based consumption subsidies in Chile

Andrés Gómez-Lobo

Andrés Gómez-Lobo (agomezlo@econ.facea.uchile.cl) is an assistant professor in the Department of Economics at the University of Chile. Previously he was a consultant at Oxford Economic Research Associates in the United Kingdom. He has undertaken a number of research projects on infrastructure subsidy design and performance, including in Chile, Colombia, Panama, and the United Kingdom. *This case study was funded by the Public-Private Infrastructure Advisory Facility, a multidonor technical assistance program.*

Chile began reforming the provision of water and sanitation services in the late 1980s. It first commercialized—then, in the late 1990s, privatized—most urban service provision. Before reform, tariffs were well below cost. After reform, despite substantial efficiency gains, concerns remained about the affordability of water and sanitation services. To guarantee adequate and affordable services for low-income households, Chile introduced individual means-tested water consumption subsidies in the early 1990s. Although the public authorities determine how the subsidy is applied, the now mostly private companies deliver the service—under a scheme with built-in incentives to ensure cost-effective service delivery by the companies and low wastage by the customers.

In the late 1980s Chile began an overhaul of the legal, economic, and institutional structure of its water and sanitation sector. An important part of the reform was a new tariff setting methodology aimed at raising water prices to the true economic cost of the service. Before the reform water tariffs covered less than 50 percent of this cost—and only 20 percent in regions where production costs were high. Steady tariff increases in the 1990s doubled real charges for Empresa Metropolitana de Obras Sanitarias (EMOS), the service provider in the Santiago metropolitan area and the country's largest water company. Rates increased even more for the smaller companies, especially those operating in high-cost regions.

As a result of these large rate hikes, a new mechanism was required to protect vulnerable households. Since connection is almost universal in Chile's urban areas, the affordability of consumption—not of connection—was the main issue, and a consumption subsidy was the obvious solution. Chile chose a means-tested subsidy targeted to individual customers rather than a traditional geographic or universal subsidy.

The subsidy program, introduced in the early 1990s, relies on the water companies to deliver the service. The government reimburses them for the subsidies on the basis of the actual amount of water consumed by each beneficiary rather than a preestablished amount, a method used in some countries. With the most important water companies having been privatized since 1998, private companies now serve 73 percent of urban clients. So the subsidy scheme is essentially being implemented by private companies on behalf of the government.

How the subsidy works

By law, the subsidy can cover 25–85 percent of a household's water and sewerage bill for up to 20 cubic meters a month (though the limit now used is 15 cubic meters a month), with the client paying the rest. All consumption above the limit is charged at the full tariff.

Each year the Ministry of Planning (Mideplan) determines, for each region, how many subsidies are to be granted and how they are to be applied, following several general principles: The subsidy is based on the willingness to pay for water services among low-income households. Only households that would be unable to purchase what is considered to be a subsistence level of consumption should benefit. And the subsidy should cover only the shortfall between actual charges and willingness to pay.[1] As a crude proxy for willingness to pay, Mideplan uses the benchmark set by the Pan-American Health Organization—that no household should pay more than 5 percent of its monthly income in water and sew-

erage charges. It is unclear whether vulnerable households in Chile would be willing to pay more or less than this 5 percent.

The subsidy scheme is funded entirely from the central government's budget. Using household survey information for each region and each company's published tariffs, Mideplan can determine how many households need a subsidy and how large benefits need to be to meet the benchmark for each region.

To obtain a subsidy, a household must apply to its municipality, which determines its eligibility mainly on the basis of a scoring system called CAS (box 1).[2] Another important criterion is that households must not have payment arrears with the service provider.

The municipality must award subsidies in the order of the applicants' CAS scores. Subsidies are normally renewed yearly for up to three years before a household must reapply. But if a municipality has distributed all the subsidies assigned to it and a new applicant has a lower CAS score than the last beneficiary, the municipality must withdraw the benefit from this last beneficiary and assign it to the more deserving applicant.

Building in incentives

The subsidy scheme has several incentive-based features. One centers on the fact that the amount of subsidy a beneficiary receives depends on the level of

BOX 1 Determining eligibility for subsidies

An eligibility scoring system called CAS is the main targeting instrument used in Chile for distributing means-tested subsidies. It produces a score for each household wishing to be evaluated based on a personal interview at its dwelling. The questionnaire used includes 50 questions on general information, identification of household members, living conditions, crowding conditions, health conditions, comfort, occupation and income, ownership of durable goods, and other socioeconomic indicators. Once the interview is conducted and the CAS score calculated, the score is valid for two years, and the household can use it to apply for many different subsidies. Besides the water subsidy, eligibility for pension payments, family subsidy, free health benefits, and other subsidies is determined on the basis of the CAS score.

Many municipalities outsource the interviews to private survey companies, but still calculate the CAS score. That lowers the risk of collusion between interviewers and households, since interviewers do not know the exact relationship between the households' answers and their CAS score.

consumption, and results from two aspects of the program's design. First, the subsidy is expressed as a percentage of the household's bill. It is therefore a price reduction per cubic meter consumed, and no benefits are given if there is no consumption or delivery of service. Second, the household must pay the full tariff for consumption above the limit of 15 cubic meters a month.

This consumption limit reconciles the need to provide income support to low-income households for basic water consumption with the need to preserve financial incentives for efficient resource use. In essence, the Chilean water subsidy can be thought of as a rising block tariff, where only means-tested households have access to the lower priced initial consumption block.[3]

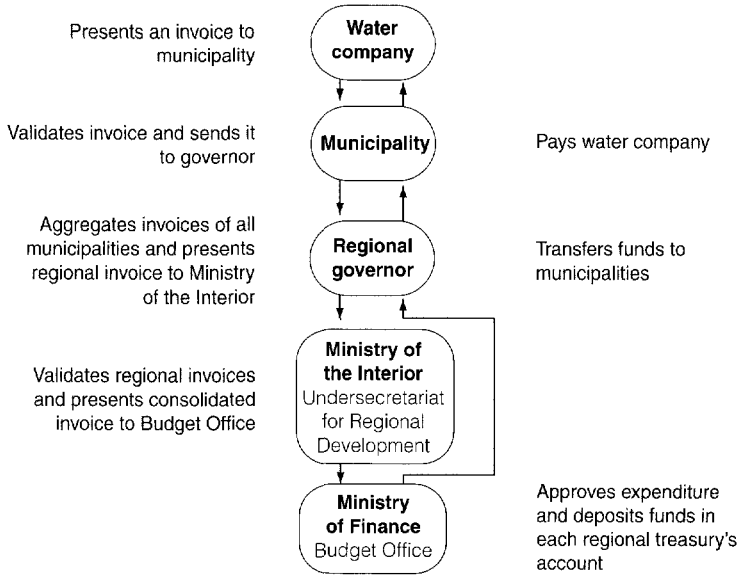
The fact that the subsidy scheme requires households to pay a fraction of the bill even when their consumption does not exceed 15 cubic meters helps to maintain good payment habits among clients. It also preserves service providers' incentive to improve commercial efficiency, since their income depends in part on the payment of this remaining charge. And the additional eligibility requirement of not having payment arrears has led to an improvement in clients' payment record.

Another incentive-based feature of the scheme rests on the relationship between the government and the service provider. This relationship is mediated by the subsidy law and its accompanying regulations.[4] The law requires the companies to bill beneficiary clients net of the subsidy amount and then bill the municipality for the subsidies granted. The municipality is thus a client of the service provider, meaning that it can be charged interest for late payment and that the service can be discontinued as a result of nonpayment (so that in the next payment period the service provider can charge beneficiary households the full amount of the bill).

This setup gives municipalities a strong incentive to transfer payments quickly to operators. The central government funds for the program are earmarked, so municipalities do not stand to benefit financially from withholding payment to the water companies. And the political wrath that could arise if they failed to pay the service providers—and thus lost the benefit for households—is potentially costly.

The financial flows and control of the program are concentrated in the Undersecretariat for Regional Development of the Ministry of the Interior (figure 1). The process requires that the company and municipality have synchronized lists of beneficiary households and that the interior ministry verify that the regional invoice is consistent with the number and value of subsidies for the region approved in the annual budget. The arrangement is clearly bureaucratic,

FIGURE 1 **Financial control and procedures for the subsidy scheme**



and municipalities are often unable to pay the companies' invoices on time. Some companies charge the municipalities interest for the payment delay. The municipalities must bear the interest and debt costs resulting from late payment, since there is no provision in the national water subsidy budget for these charges.

Despite this problem, the fact that companies receive a reimbursement for services and subsidies already delivered has several benefits. The arrangement gives the companies full incentives for providing efficient and reliable service. The subsidies accrue to households, not companies, and the amount of resources distributed is independent of the service provider's operational efficiency. Companies should be indifferent with respect to the subsidy scheme and receive no financial benefit from the program, except perhaps through the reduction of payment arrears by poor households.

Who benefits?

In 1998 nearly 450,000 subsidies were distributed nationally, benefiting almost 13 percent of households by an average US$10 a month. The total cost was US$33.6 million. In some regions where incomes are low and water charges high, close to a third of households received the subsidy. On average,

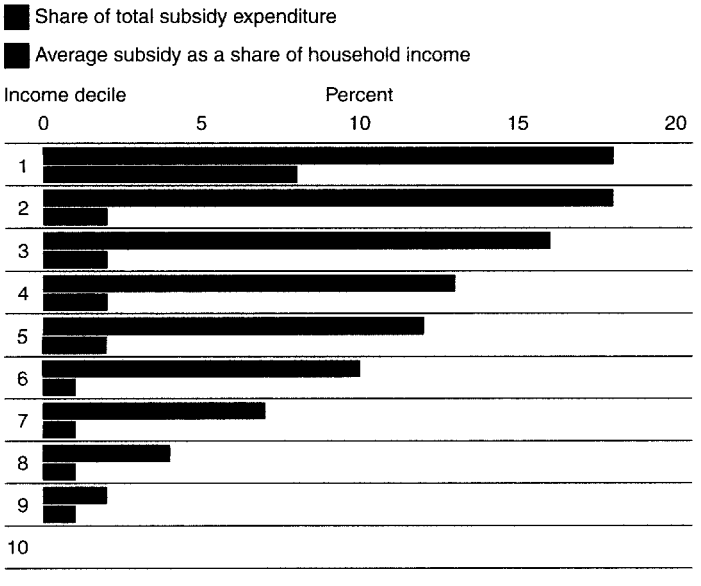
52 percent of benefits in each region accrue to the three lowest income groups, and only 23 percent leak to the five highest income groups (figure 2).[5] Subsidies represent a larger share of income for poorer households, nearly 8 percent for the lowest income group.

What are the lessons?

The introduction of the subsidy—and especially the targeting results achieved—have been key to Chile's ability to raise water tariffs to levels reflecting costs without compromising its social and distributional goals. And the costs to the government of doing so have been low. The cost of the subsidy in 1998, US$33.6 million, was well below the cost of the previous universal subsidy scheme. Before the reforms in 1988 the water and sewerage sector had a financial deficit of 2 percent of assets. But in 1998 this situation was reversed. Companies reported a surplus of close to 4 percent of assets and net profits of US$107 million, more than three times the cost of the subsidy scheme (excluding administrative costs).

Despite the successes of the subsidy program, several issues need to be considered if such a scheme is to be replicated in other countries. First, meter-

FIGURE 2 Distribution of water subsidies across income deciles, November 1998



Note: Income deciles are based on per capita household income. Data include only households with shared or own water connections.
Source: Mideplan (Ministry of Planning), "Encuesta de Caracterización Socioeconómica Nacional" (Santiago, 1998).

ing is a prerequisite for this type of output-based consumption subsidy. For countries with low coverage of meters among low-income households, such a scheme may not be viable. In these countries, however, the most pressing social issue usually is not ensuring that water is affordable, but increasing the number of connections. For that purpose, a means-tested subsidy analogous to the one in Chile would be easier to apply, since metering is not required. Service providers could charge new clients the true cost of connection—perhaps providing some credit by permitting payment in installments—minus a subsidy to eligible households. The government could then reimburse the service providers on the basis of the number of eligible households connected.

Second, the means-tested targeting used in Chile requires a certain amount of institutional capacity, especially at the municipal level. Even in Chile, some municipalities still lack sufficient capacity to adequately administer and control the subsidy scheme. For countries with less institutional capacity such a complex system may not be viable. These countries could adopt simpler targeting mechanisms, for example, a scheme based on a geographic poverty map, like that used in Colombia. Moreover, a scheme using a connection rather than a consumption subsidy will require less institutional capacity, since households' eligibility must be evaluated only once.

Third, an individual means-tested subsidy may be expensive to apply. Chile uses the same targeting instrument to distribute several welfare benefits, lowering the administrative costs significantly. Applying such a scheme for only one subsidy program may be too expensive. Again, however, the administrative costs for a connection subsidy are much lower than those for a consumption subsidy.

Notes

1. This is not to say that no further benefits should accrue to low-income households for purely distributional reasons, only that the best way to meet such goals may be through general welfare programs, not a sectoral consumption subsidy.

2. *CAS* comes from Comités de Asistencia Social Comunal (Communal Social Assistance Committees), which promoted the idea of using a standard measure for allocating social resources among the poor.

3. A consumption-based subsidy requires that each household have a meter. This is not much of an issue in Chile, where metering is almost universal in urban areas.

4. These laws and regulations are available in Spanish at http://www.siss.cl.

5. By comparison, in Colombia, the only other Latin American country with an important formal water subsidy scheme, 37 percent of subsidies reach the five highest income groups.

Easing tariff increases

Financing the transition to cost-covering water tariffs in Guinea

Penelope J. Brook and Alain Locussol

Penelope J. Brook (pbrook@worldbank.org) is program manager of the Rapid Response Unit, Private Sector Advisory Services, at the World Bank. She has worked extensively on the design of infrastructure sector reforms to benefit the poor. Alain Locussol (alocussol@worldbank.org), lead water and sanitation specialist in the Africa Region at the World Bank, was in charge of the World Bank's support for the Guinean water project in 1985–89.

Guinea entered into a lease contract for water services in its major towns and cities in 1989. The government was committed to cost recovery for the services, but wanted to avoid a major tariff shock at the beginning of the contract. So, for the first six years of the contract an International Development Association credit subsidized a declining share of the private operator's verified supply costs while the water tariff was raised until it covered costs. This arrangement jump-started the move toward cost recovery and more sustainable water services—giving credibility to reform in a region and during a time in which there was little experience with private provision of water services—while also setting a time limit on subsidy commitments.

When a public sector water utility does not recover the costs of providing service, it is often unable to extend the system—leaving poorer, marginal areas unconnected to the water grid. Consumers who are connected often receive poor-quality water and intermittent service because there is not enough revenue for treatment and maintenance. Unconnected poor consumers generally pay much more for water than do consumers with access.

Guinea faced this situation in the late 1980s. Its urban water supply system was one of West Africa's least developed. Less than 40 percent of urban dwellers had access to piped water through household connections or standpipes. Where connections existed, service was often interrupted and water treatment inadequate. To improve this situation, in 1989 the government entered into a lease arrangement for private operation of water services in the capital city, Conakry, and 10 other cities and towns. Under a lease contract, because the lessor effectively buys the rights to the income stream from the utility's operations (minus the lease payment), it assumes much of the commercial risk of operations. The lessor's profitability depends on how much it can cut costs while still meeting the quality standards in the lease contract. Thus the lessor has incentives to make operations more efficient.

When the reform was implemented, the water tariff charged to households was far below cost recovery levels. The government was committed to seeing tariffs rise to cover costs, to ensure the financial viability of providing water services and enable their expansion over time. But it wanted to phase in tariff increases gradually, both to ease the burden on consumers and to exhibit improvements in performance before the full costs of those improvements showed up on consumer bills.

The challenge was finding a way to subsidize services while tariffs were raised to cost recovery levels without undermining the private provider's incentives to make service provision, billing, and collection more efficient. In this context an International Development Association (IDA) credit that also financed extension of the water supply system introduced a transparent, limited duration subsidy of the consumer tariff. This subsidy was designed to achieve two objectives. First, the subsidy sought to preserve the operator's incentives to improve performance—by increasing staff productivity, reducing unaccounted-for water, and increasing connections and collection ratios. Second, in the early stages of the contract the subsidy was meant to protect the private operator against foreign exchange risk—a common obstacle to private participation in the water sector.

Bidding for the lease contract was based on the lowest rate that the operator would receive for each cubic meter of water billed and collected, separated into local currency and foreign exchange components, and on the lowest price it would charge customers for new connections. The winning bid, by a consortium of Compagnie Générale des Eaux and SAUR, was 30 percent below consultant estimates and 15 percent below the second-lowest bid.

Two organizations were central to the lease arrangement: a state-owned water authority, Société Nationale des Eaux de Guinée (SONEG), and a water management company, Société d'Exploitation des Eaux de Guinée (SEEG). SONEG owned the water supply facilities in the cities and towns covered by the lease and was responsible for sector development, including servicing debt and planning, financing, and implementing new investments. SONEG was also responsible for setting tariffs, subject to ministerial approval.

SEEG was owned by the state (49 percent) and the winning consortium of Compagnie Générale des Eaux and SAUR (51 percent). SEEG held the 10-year lease contract with SONEG, which made SEEG responsible for operating and maintaining urban water supply facilities, billing customers, and collecting charges. The private consortium provided management services to SEEG through a separate technical assistance contract.

Making the move to cost-covering tariffs

Before the reform Guinean households paid US$0.12 a cubic meter (1989 U.S. dollars) for water provided through the grid. Initial projections were that the average charge to consumers would need to rise to US$0.76 a cubic meter in 1995, and then fall back to US$0.68 (Triche 1990). This implied a tariff increase of up to 630 percent.

As noted, SEEG was remunerated based on the rate set in the lease contract. That rate was intended to cover SEEG's operating expenses—in both foreign exchange and local currency—and depreciation on its assets, and to provide a return on equity. Over the course of the contract the goal was to raise the tariff paid by consumers to cover the lease contractor rate and to provide an asset rental fee to SONEG, calculated to cover operating expenses, service debt, and finance investment. In other words, the goal was to make water services financially viable and so sustainable. At the same time, tariffs would need to be kept in check through continuing pressure on the operator to reduce costs.

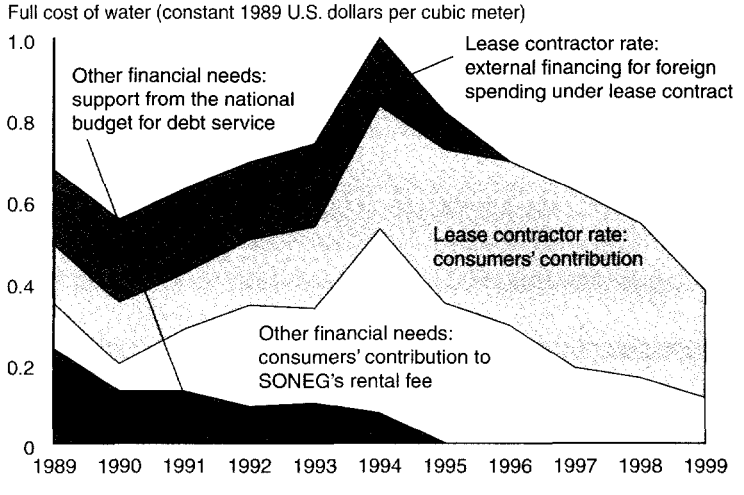
The cost of phasing in increased tariffs was funded by the IDA credit (US$16.9 million), calibrated to finance SEEG's foreign exchange costs by 100 percent for the first four years, and on a declining basis over the next two

years. The credit was combined with a government commitment to finance SONEG's debt service on a declining basis over these first six years. Through this mechanism SEEG obtained the lease contractor rate it had bid, but its financing was shared between consumers and the credit (figure 1).

At the start of the contract SEEG received an advance installment from IDA calculated to be 30 percent of estimated first-year water sales. This advance was compensated by deductions from disbursements of the credit over the next five years. Following this initial payment, the credit was disbursed by the Guinean government based on independently audited statements of collections by SEEG, issued every four months. Access to the credit was thus directly linked to service delivery and collections performance.

At the same time, SEEG made monthly asset rental payments to SONEG. In the first two years the rental fee was set to cover SONEG's operating costs. Over the following four years it rose to cover an increasing portion of SONEG's debt service obligations, with full coverage of these costs by the end of the sixth year. Two years into the contract, SEEG for a time discounted its rental payments to SONEG because of long arrears from public sector clients.

FIGURE 1 Water rates and cost sharing under the lease contract, 1989–99



Source: World Bank data.

Under the lease contract the lease contractor rate could be adjusted quarterly to reflect changes in foreign exchange costs and biannually to reflect changes in local costs. In addition, provision was made to renegotiate the lease contractor rate after four years—when a new, cheaper supply source came online. (This renegotiation did not occur, however.) Consumer prices were adjusted based on a cost-plus formula, intended to reflect changes in service costs for SEEG and SONEG.

Based on this cost adjustment process, the tariff continued to increase after the subsidy was phased out, reaching US$0.83 in 1996, then holding constant in local currency for the rest of the lease contract. By late 1997 the minimum bimonthly payment for service was about US$13 per customer—very high given household incomes. The result was a steep fall in collections and a rise in inactive connections.

Why did tariffs rise so high? One reason was costs that appear high by regional standards—costs driven by low labor productivity, a large continuing presence of expatriate staff, high debt servicing costs, and considerable bad debt. Moreover, regulatory pressures to control these costs were weak—as reflected, for example, in the government's failure to renegotiate a reduction of the lease contractor rate or revise the cost indexation formula after four years of operation. Complicating matters were disputes between SEEG and SONEG over definitions of water losses—and hence responsibility for actions to reduce them.

Improving services and operations

The contract led to many service improvements. Investments in new capacity (external to the lease but financed by IDA and other donors), combined with rehabilitation and maintenance, increased the share of the population with access to safe water from 38 percent in 1989 to 47 percent in 1996. By 1994 piped water in Conakry was in compliance with World Health Organization norms (Gélinas and others 1996, cited in Ménard and Clarke 2000). Household connections increased (if less than originally hoped), and metering increased from 5 percent to 98 percent for private customers, and to 100 percent for government customers. Customer service also improved, with shorter delays for new connections and for repairs to the network.

But the contract did a poor job of reducing physical and commercial losses and achieving big improvements in access. These failures probably contributed to the high tariffs, because production inefficiencies could be passed through to the tariff, and slow progress on connections meant that capital costs were covered by a small customer base. New connections were proba-

bly inhibited by the absence of financing for small social service connections (an approach used successfully in Benin and Côte d'Ivoire) and by abundant alternative water sources, at least during the rainy season. Conakry's annual average of more than 4 meters of rainfall can yield sufficient roof catchment for low-income households even if roofs are small.

With the high price of water from the network, many residents could not or would not pay for it: in 1994 nearly 12,000 connections were inactive because of nonpayment. The record on billing and collection was patchy. In 1987 the public water utility collected on only 12.5 percent of its billings (Ménard and Clarke 2000). Bill collection from private customers improved to about 75 percent with the implementation of the lease contract. But as tariffs rose, collections fell to around 50 percent in 1991–92, rising to about 60 percent in 1993–96. Collecting from the public sector proved even more problematic, particularly after the early years of the contract, with collections falling to 50 percent in 1991 and 10 percent in 1993. SEEG sought legislation to penalize illegal connections and facilitate recovery of arrears, but the legislation failed to receive political support. Following this, little attempt was made to eliminate illegal connections.

Conclusion

A recent analysis of the reform estimates that between 1989 and 1998 the contract generated a net welfare gain in the region of US$33 million (1996 U.S. dollars). Most of this gain went to domestic players, including consumers (Ménard, Clarke, and Zuluaga 2000).

While the subsidy scheme worked smoothly, operating and regulatory performance were mixed. Guinea's experience illustrates the challenges of creating effective performance incentives for private operators when regulations and monitoring are weak and the operator is not fully subject to commercial risk. The lease contract in Guinea, which expired in 1999, was not renewed, and the international partners left the country in early 2001. Given the bad publicity surrounding these events, it may be difficult for SONEG to attract a new private operator through the competitive bidding now being prepared.

The declining, output-based subsidy used to smooth the introduction of Guinea's lease contract holds promise for other developing countries where tariffs are well below cost recovery levels and the long-term capacity to subsidize is limited. But the resulting arrangements are likely to be efficient and sustainable only if the tariff-smoothing process is combined with credible contractual and regulatory mechanisms for achieving cost savings, and these savings are passed on to customers.

Note

This chapter draws extensively on Brook (1999) and Ménard and Clarke (2000). Details on the design of the subsidy arrangement are drawn from Triche (1990). Evidence on results and on the welfare impact of the lease arrangement is drawn from Ménard, Clarke, and Zuluaga (2000). The authors are grateful to George Clarke and Richard Verspyck for comments and to Lorenzo Bertolini for assistance in preparing figure 1.

References

Brook, Penelope J. 1999. "Lessons from the Guinea Water Lease." Public Policy for the Private Sector Note 78. World Bank, Finance, Private Sector, and Infrastructure Network, Washington, D.C.

Gélinas, Yves, Harold Randall, Lucie Robidoux, and Jean-Pierre Schmidt. 1996. "Well Water in Two Districts of Conakry (Republic of Guinea), and Comparisons with the Piped City Water." *Water Resources* 30(9): 2017–26.

Ménard, Claude, and George Clarke. 2000. "A Transitory Regime: Water Supply in Conakry, Guinea." Policy Research Working Paper 2362. World Bank, Development Research Group, Washington, D.C.

Ménard, Claude, George Clarke, and Ana Maria Zuluaga. 2000. "The Welfare Effects of Private Sector Participation in Urban Water Supply in Guinea." Policy Research Working Paper 2361. World Bank, Development Research Group, Washington, D.C.

Triche, Thelma. 1990. "Private Participation in the Delivery of Guinea's Water Supply Services." Policy Research Working Paper 477. World Bank, Washington, D.C.

Maintaining roads

Experience with output-based contracts in Argentina

Gerard Liautaud

Gerard Liautaud (gliautaud@worldbank.org) works in the Latin America and the Caribbean Region of the World Bank. He has managed the Bank's funding for the Argentine roads project and advised the Argentine government over the duration of the Bank's support for the project. The Bank loans total US$435 million and partially fund the project over the period 1997–2002: a loan of US$370 million (75 percent of the funding) for phase 1 and a loan of US$65 million (50 percent) for phase 2. The Argentine government funds the remaining cost of US$215 million from general tax revenue. This case study was funded by the Public-Private Infrastructure Advisory Facility, a multidonor technical assistance program.

Creating capacity and incentives for ongoing maintenance of capital investments is a challenge across all infrastructure sectors, but especially for services that cannot attract cost-covering user fees, such as low-volume roads. The Argentine government has responded to this challenge in its nonconcessioned road network by using output-based contracts with the private sector for rehabilitation and maintenance. The multiyear, lump sum contracts, funded by the government and the World Bank, specify required road service outputs and use incentive-based payment schedules to ensure the quality of the work. After three years of operation the 60 contracts (averaging US$10 million) in the first phase are working well. By 2002 around 75 percent of Argentina's nonconcessioned roads should be operating under output-based contracts.

Road maintenance and rehabilitation have traditionally been procured by the Argentine government through input-based contracts with the private sector. Several goals underlie its shift to output-based contracts: To cut the administrative costs associated with input-based contracts—in particular, the costs arising from the frequent requests for payments to cover necessary increases in inputs. To encourage innovation and cost-effectiveness by giving contractors more responsibility. To develop more stable funding for road maintenance (under traditional arrangements national funding dried up during a fiscal crisis). And to better meet road users' needs.

The contracting is run at the national level by the highways authority. The first step was a nationwide road survey to estimate traffic, define the minimum (rather than optimum) road standards, define the rehabilitation and maintenance required, and identify the size and shape of the subnetworks for contracting out. Roads with traffic in the range of 300–3,000 vehicles a day are eligible for output-based contracting. (Roads with traffic exceeding 3,000 vehicles a day are considered concessionable.) On the basis of the survey information the government set uniform national output indicators for the contracts. To help define the indicators, road users (who spend US$10 billion annually operating vehicles) were surveyed to find out what they consider an acceptable level of service. Contracts were awarded to the lowest lump sum bidder, and a share of the payments to contractors is based on how well they perform against these indicators.

In their initial application, the output-based contracts covered maintenance of paved roads, with payout schedules based on kilometers per month. The next stage covered rehabilitation and maintenance, with contracts requiring lumpy up-front payments to cover rehabilitation costs. A third stage under consideration would cover new construction of low-volume roads (less than 250 vehicles a day).

Starting out with maintenance contracts

Introduced in August 1995, the first output-based contracts are kilometer per month contracts spanning four years (and recently renewed) and covering a network of about 3,600 kilometers of paved roads. The 11 contracts cover roads that were in good to fair condition and expected to require only routine maintenance to remain in that condition over the next few years.

Contractors are paid equal monthly installments for specified services, as long as the quality of outputs complies with the technical specifications. If the outputs do not comply with standards, daily penalties are imposed (and sub-

tracted from future payments) until the necessary repairs are carried out. The penalties are based on deficiencies noted during monthly inspections. No penalties are imposed for the first two or three months following the award of a contract, giving the contractor time to repair any preexisting deficiency.

The contracts are working well. Routine maintenance is costing an average of about US$175 per kilometer a month. About 600 certificates of noncompliance have been issued, giving rise to penalties amounting to only 1 percent (US$300,000) of the total amount of the contracts. Given the satisfactory outcome, the contracts were renewed for four more years with the same contractors.

Adding rehabilitation

On the basis of the experience with the maintenance contracts, a contract was designed for combined rehabilitation and maintenance of paved roads. This contract, called *contrato de recuperación y mantenimiento* (CREMA), requires the contractor to rehabilitate and then maintain a network of roads for five years for a lump sum amount. Each contract covers a network comprising contiguous or area-specific road sections ranging in length from 100 to 300 kilometers. The contract specifies the sections that need rehabilitation and the minimum solution required to ensure a positive net present value for the investment.

Bidding

In designing the contract, different rehabilitation strategies were tested, involving spreading the rehabilitation across the life of the contract to avoid funding spikes, using contracts of different durations, and adjusting the payment schedules to reduce financing costs. The highways authority settled on contracts requiring rehabilitation works to be carried out during the first year, and routine maintenance activities throughout the five-year contract period.

Bidding is done through international competitive tenders. In early bidding rounds the payment schedule called for a 5 percent advance followed by two equal payments of 10 percent, with the rest in equal installments over the next four years. But the bids exceeded official estimates by nearly 100 percent because of high financial costs (since most expenditures would have been in the first year, contractors would have had to borrow). These early rounds were canceled, and a schedule with larger up-front payments was chosen to reduce contractors' financial costs.

Only after the contract is awarded does the contractor prepare a detailed engineering design. On the basis of its own risk assessment, the contractor is

free to propose any rehabilitation solution above the minimum threshold defined in the contract. (This involves judgments about how much up-front rehabilitation is required to get the roads to a level at which they can be cost-effectively maintained.) But the contractor is not allowed to change the agreed financial bid. The decision to postpone the detailed designs until after contract award was made to expedite the bid proposals (and thus the reduction in the rehabilitation and maintenance backlog) and to cut the bidding costs.

Payments and monitoring

The payment schedule is designed to provide incentives for the contractor to maintain the network for the full length of the contract. The contractor receives an advance payment of 5–10 percent, followed by 15–25 percent at the end of the first six months, when specified activities have been executed, and 25 percent at the end of the first year, when rehabilitation works have been completed. Thus up to 60 percent is paid by the end of the first year; the remaining payments are made in 48 equal monthly amounts. In addition, the contract requires a performance guarantee of 20 percent.

The contract allows reimbursement of cost overruns in certain circumstances beyond the control of the contractor, such as earthquakes, hurricanes, and bitumen shortages. The government uses the contractor's schedule of input prices submitted in the bid as a baseline for overrun estimates. The risk of excessive cost overrun is contained by a 25 percent cushion on these prices. If the contractor's estimate exceeds the baseline by more than 25 percent, the contract can be rebid.

In contrast with input-based contracts, under the CREMA payments are made when the contractor achieves a specified level of service. Performance is assessed during monthly on-site inspections by the government engineer and the contractor. Throughout the contract period the rehabilitation works must comply with the specified minimum and maximum standards (box 1). The compliance with maintenance standards is inspected visually on a monthly basis. Penalties for noncompliance are set for each indicator. For example, a pothole left unrepaired beyond the authorized time limit will cost the contractor US$400 a day until it is patched. Penalties are deducted from the monthly payments.

Road users can also monitor performance, voicing concerns about the quality of service in a claim book available at the contractor's site office. Entries in the claim book are publicized in the local media. Contractors must signpost each network with information about how they can be contacted.

BOX 1 Rehabilitation and maintenance indicators

Throughout the contract period rehabilitation works must:

- Meet or exceed the minimum thickness of overlay.
- Not exceed the maximum level of roughness, rut depth, cracking, or raveling.

Regular visual inspections of maintenance activities focus on a few essential items in ensuring compliance with the specifications:

- Potholes, cracking, and rutting.
- The condition of shoulders, culverts and drains, and the roadside environment.
- Guardrails and vertical and horizontal signs.

And a representative of the user community is periodically allowed to participate in monthly inspections.

Bidding for phases 1 and 2

The CREMA program was designed to be implemented in two phases. The first phase involved a network totaling 11,700 kilometers in length, 55 percent of the nonconcessioned national paved network. That network was generally in good to fair condition, with 25 percent in poor condition, and had daily traffic averaging about 750 vehicles. In a process following international competitive bidding practices, 60 contracts were let in 1997, covering subnetworks averaging about 180 kilometers in length.

The contracts were awarded to mostly local construction companies for a total of US$650 million, equivalent to US$11,000 per kilometer a year. With the larger up-front payments, the lowest bids exceeded the budget estimate by about 24 percent. Rehabilitation works accounted for 74 percent of the total bid amount, and routine maintenance for 26 percent. (The costs—US$66,000 per kilometer for rehabilitation over the 8.25-year life of the works and an estimated US$3,000 per kilometer each year for maintenance—are roughly in line with those in other parts of Latin America.) Private sector participation was high, with each contract attracting 5–20 bid proposals. The average contract price was US$10 million.

The second phase involves a network of 4,000 kilometers and 20 contracts. Bidding of the first two subnetworks, initiated in August 2000, received a positive response from the private sector: the lowest evaluated bidders offered financial proposals 5 percent below official estimates. This outcome is probably the result of increasing private sector comfort with the contracting process, a higher share of up-front payments (and thus lower financing costs),

and better estimating by the highways authority. The remaining subnetworks are expected to be tendered in 2001.

Assessing results for phase I contracts

The first phase was successful in many respects during its first three years:

- By requiring contractors to perform their own quality control, the system has cut the government's cost of supervising the network.
- The fixed price contracts reduced the risk of cost overruns. The only cost increases so far have been due to natural disasters or force majeure events (mostly related to El Niño) and have amounted to about 3 percent of the total contract price.
- The requirement that contractors carry out detailed engineering designs before initiating the works has minimized delays in project implementation. In traditional programs such delays are due to lack of stocks of government-prepared subprojects.
- By making the long-term payment obligations legally binding on the government, the CREMA has deterred the Treasury from failing to provide funding for road maintenance.
- The performance indicators have been simple enough to apply and monitor, and they get the desired results. (Output indicators invariably involve a tradeoff between accurate measurement of the road service required and unambiguous and low-cost measurement.)
- The contractors' obligation to maintain the roads over a five-year period has reduced the risk of unsatisfactory quality in the rehabilitation works.
- The system has fostered some innovation in the programming and execution of works, since payments are tied not to rigid specifications on workmanship but to outputs. Nevertheless, as contractors get used to the new system, they are starting to question the appropriateness of uniform national standards and to ask that they be allowed to set the standards once the government has defined the quality of service.
- Ex post financial and economic evaluations showed that the rehabilitation and maintenance funding yields an economic rate of return of 60 percent (at a 12 percent cost of capital). The contracts will reduce the need for capital investments by nearly 30 percent: after the five-year implementation period better quality roads will lead to a drop in ongoing capital and maintenance expenditures from about US$11,300 per kilometer a year to US$8,000.

- Rates of return for the contractors have not been assessed. But the competition for the contracts and the fact that only one of the 60 contracts has had to be canceled because of a contractor's financial difficulties suggest that the contracts are financially attractive to the private sector.
- The CREMA program has substantially improved the condition of the network, reducing the share of roads in poor condition from 25 percent to less than 5 percent by the end of 1999. As a result, road users' costs have been reduced by more than 10 percent.
- Damage to roads caused by vehicle overloading is being addressed by asking contractors to provide and operate devices for measuring axle loads on-site and to report any excess load problems to the highways authority. But the contractors still have to rely on the government for enforcement.

Conclusion

Argentina's approach to road maintenance offers an effective means to improve efficiency and public accountability. By holding contractors accountable for the future quality of the roads, output-based contracts keep them more alert to quality during the execution of road works. And by passing some monitoring functions on to contractors—and requiring the permanent presence of their maintenance crews on-site—the contracts guarantee efficient monitoring of pavement and traffic conditions, leading to more timely corrective actions.

In the long run this approach could both reduce the cost of maintenance and improve its quality. The approach is one that could be transferred to other countries. Indeed, pilot initiatives with similar contracts are already under way in Brazil, Chile, Colombia, Guatemala, Paraguay, and Uruguay.

Extending rural electrification

A survey of innovative schemes

Ray Tomkins

Ray Tomkins (ray@eca-uk.com) is an energy economist with wide experience advising on power sector reform and rural electrification in developing countries in Africa, Asia, and Eastern Europe. In 1997 he set up Economic Consulting Associates Ltd., based in London. He was previously a director of London Economics, where he managed the work of the international utilities team.

Output-based contracting for rural electricity services—using private providers and linking payments of subsidies to outputs—could deliver better results than traditional approaches to subsidized electrification. Even so, few rural electrification schemes have explicitly (and successfully) linked subsidies to output targets. This is probably because most electricity sectors remain highly centralized, politicians find it hard to move to cost-covering tariffs, standards are still tightly regulated, and entry is often illegal for small private operators. But recent initiatives provide useful lessons for developing full output-based contracting. Coupled with the examples in this book from other sectors, they suggest that by more precisely targeting subsidies, sharpening incentives for operational efficiency, and mobilizing private investment, output-based contracting could boost consumer access to services and cut funding costs and performance risks for taxpayers and donors.

As a result of low population density, difficult terrain, and low consumption, rural electricity schemes are usually more costly to implement than urban schemes. In addition, low rural incomes can lead to problems of affordability (though where electricity replaces other commercial fuels, such as kerosene, households' energy costs may fall rather than rise). And the long distances mean greater electricity losses and more expensive customer support and equipment maintenance. Thus rural electrification projects have often required subsidies to make them financially viable.

In the past most subsidized rural electrification schemes have been run by high-cost, centralized public utilities charging tariffs that do not cover costs. Cash-constrained governments generally have not explicitly made up the difference. As a result, electrification rates remain extremely low in many developing countries—as low as 10 percent in some African countries, for example. But the wave of electricity sector reform in the developing world—breaking up public monopolies and privatizing generation and distribution—provides an opportunity for a new approach, indeed, demands one.

One approach with much potential is output-based contracting. Its focus on outputs gives operators the flexibility and the incentive to innovate and to respond to consumer preferences. Several countries are implementing or developing rural electrification schemes using elements of output-based contracting.

This chapter reviews the lessons from these cases, focusing on decisions about who should receive the subsidy, how to link the subsidy to performance, how to select projects, and how to monitor contracts.

Emerging approaches

In Argentina a program of exclusive concessions pays private operators the lowest subsidy required to connect consumers in isolated rural areas far from the electricity grid to off-grid services based on renewable energy. Under this program concessionaires must provide service to all who ask for it within an exclusive area. The connection costs are partially subsidized by a World Bank loan, a Global Environment Facility grant, and a special electricity fund run by the Argentine government. Users must contribute at least 10 percent of the costs, with the share depending on capacity to pay in the province and on the size of the system. Connection subsidies are paid to the operator on proof of installation (checked by random audits) and decline over time. One province has negotiated a pilot concession with an existing provincial distribution concessionaire, and three others will award new (negotiated) off-grid electrification concessions in 2001. Where there is no local concessionaire or the operator does not

want to provide service, the new concessions will be offered in a competitive tender for the smallest subsidy. The program, estimated to cost US$120 million, will cover about 70,000 households and at least 1,100 schools and clinics.

A similar approach has been proposed in Cape Verde. Under competitively bid concessions, subsidies would cover part of the cost of installing wind generators or solar photovoltaic systems for houses, street lighting, or electricity sales. Still in the design phase, the proposed scheme would disburse subsidy payments every six months on adequate proof of completed equipment sales or installations.

Chile uses a rural electrification fund with a planned life of 10 years to offer one-time, competitively awarded subsidies to local operators bidding to provide service. The goal of the scheme is 100 percent electrification by 2004. Local operators, often working with community groups, commit to a target for new connections. Their proposals are scored against a checklist of objective criteria, including a cost-benefit analysis, the operator's investment commitment, and social impact. Although grid connections are preferred, renewable off-grid systems can also get support. Operators receive the subsidy up front and must make a minimum contribution to project costs according to a formula set by the government. Operating since 1994 and using annual tenders, the fund had increased rural electrification by 50 percent in 1999. The subsidy paid over this period amounts to US$112 million, while private operators have invested US$60 million.

Panama is applying a variant of this approach—"open season" competition, in which blocks of money are offered to private companies bidding to construct the largest number of connections. Bidders can identify potential connections from a database maintained by the rural electrification office. A social fund (using donor and government funds) disburses payments against agreed construction milestones, with random audits to check installations. Once construction is complete, the assets are transferred to the local private distribution company, which commits to operate and maintain the infrastructure for 20 years. The distribution company calculates the subsidy required for the 20 years, and this is paid up front in a lump sum. In 1999 the program funded just over 100 projects, with an average size of 34 connections. Nonexclusive concessions are also allowed, but so far there have been no takers.

In Asia countries have more commonly turned to cooperatives for rural electrification, applying performance-based subsidies with mixed success. In Bangladesh and the Philippines cooperatives have to meet specified targets—21 in Bangladesh, 8 in the Philippines. Payout of the donor-provided subsi-

dies to the cooperatives depends in part on their achieving the annually negotiated targets, such as reducing system losses, increasing sales, meeting customer connection targets, improving collection rates, and repaying loans. In Bangladesh targets are also the basis for annual bonuses to cooperative employees. The cooperatives' performance has been mixed. While some have achieved the targets, others have suffered financial losses, requiring the diversion of subsidies to offset operating losses.

Deciding what to subsidize

Schemes with output-based characteristics have delivered subsidies as capital grants for extending or creating an isolated grid or for installing small generators powered by diesel or renewable energy. They have also delivered subsidies for connecting consumers. And some schemes have delivered subsidies for rehabilitating networks.

Capital grants have been paid to operators as they begin the construction works, as they complete the works, or in phases as they reach milestones. And sometimes when many areas are being electrified under a phased program, grants are paid as a certain number of villages gain access to electricity or a certain number of consumers get connections.

Most grants have partially funded investments, not consumption. (Consumption subsidies tend to erode operational efficiency and require long-term funding commitments.) Partial funding, requiring a supplementary contribution from users or operators, is a good test of user demand and preferences. The grants can be provided as one-time payments following a grant competition (as in Chile) or paid for the completion of specific investments (as in Argentina and Panama and as planned in Cape Verde). A few schemes plan to pay grants per household, but these tend to be for solar photovoltaic systems for individual buildings and are paid to the supplier on installation or through equipment financing.

In some rural electrification schemes that include off-grid systems (as in Argentina and as proposed in Cape Verde), grants are paid at a declining rate over the project period. The rationale is that the higher initial grants are needed to overcome "first cost" barriers, to help promote self-financing for later development, and to encourage a more rapid connection rate.

Linking payment to performance

Rural electrification schemes have used several output targets:

- Connecting all consumers in an area who wish to be connected and are willing and able to pay the required (subsidized) costs.

- Connecting groups of households or villages in an area.
- Installing systems (such as solar photovoltaics) in houses or buildings.

Other performance targets include reducing electricity losses and improving revenue collection. Measuring performance in these areas is more complex, however, and no known schemes have directly linked the disbursement of aid to such targets.

Where targets are insufficiently defined or monitored or the infrastructure to support delivery of electrification services is missing, problems can result. Grant funding targeted at equipment installation may end up supporting better-off households rather than the poor, because the wealthier are better able to pay their share of the costs. Moreover, even when installation targets are met, electricity services may not be delivered. In India the release of subsidy funds is based on the number of villages electrified. But sometimes the lines have been poorly constructed or household connections not made, so that little electricity flows to consumers. The cooperative schemes in Asia, which use many different performance measures, give greater attention to service delivery, but the weighting of different factors dilutes the direct incentive effect of linking payment to performance.

Choosing projects

Rural electrification projects can be quite small, so that in many countries the number of potential projects could run into the hundreds. In selecting projects, well-defined criteria are important to ensure that funds are allocated efficiently and the program is financially sustainable.

Rural electrification programs with output-based features have all developed a system for ranking and prioritizing projects, taking into account such factors as capital cost, number of consumers, and demand growth. In choosing areas to be electrified, programs need to avoid top-down selection and political patronage.

The key issue is whether projects will be financially viable (with the subsidy)—whether the communities will have sufficient demand and whether they will be able to afford the electricity payments to cover operating costs. Projects that are not financially viable tend to drag the entire program into losses, resulting in the diversion of subsidies to sustaining the existing system rather than expanding access to electricity.

A particularly effective approach to selecting projects is to emphasize the contribution—especially the financial contribution—to be made by the local organization sponsoring the project, whether the community, a cooperative, a

private company, a local authority, or a nongovernmental organization. In Panama the larger the share of financing to be provided by the community, the higher up the priority list a project moves.

The Chilean scheme requires both the users and the distribution company to contribute to the financing. Users must pay the costs of connection from the distribution transformers to the house and of the wiring within the house, roughly 10 percent of the cost of the project. This cost is initially financed by the operators and repaid by the user over time. While the distribution company must contribute a minimum amount calculated by a formula, it may contribute more to increase its chances of receiving a grant. This demand-driven approach to choosing projects helps to ensure that those selected have local support and that there is sufficient willingness to pay for electricity. It also improves the probability that the forecast demand for new connections and electricity will materialize rapidly, thus helping to ensure projects' financial viability, and that the allocation of capital costs and subsidies is targeted toward maximizing the desired output—the delivery of electricity services.

Selecting operators

For selecting operators, some recent schemes have introduced an element of competition, with the grant linked to the number of new connections. The competition has been based on either the smallest grant to supply a given number of consumers or the largest number of consumers for a given grant.

In some cases the competition gives the winner a concession to supply all potential consumers in an area (an exclusive concession). In others, the competition gives the winner only the responsibility to supply specified villages or households (open entry, in which other competitors could supply additional consumers).

The Chilean scheme uses competition for grants but does not offer an exclusive concession. Companies prepare submissions specifying the areas to be electrified and the number of consumers to be connected. These submissions compete for grants, but there is no direct competition between companies to electrify a given area. A drawback of the Chilean approach is the imbalance of information between the companies and local authorities. While municipalities and regional planning agencies may exert some pressure on the companies at the planning stage to keep costs low, their lack of information limits their effectiveness: municipalities have little understanding of electricity distribution, and regional planning agencies little knowledge of geographic constraints to electrification in particular areas.

The proposed scheme in Cape Verde would channel aid through private companies that successfully tender for concessions—one to supply electricity services on Santiago Island and another for the eight other inhabited islands. The companies, which will not have exclusive concessions, will be obligated to sell off-grid electricity systems based on wind or solar photovoltaics or to install such systems and sell the electricity. The successful tenderers will be those asking the smallest fee (subsidy) to start up and manage the concession to provide these services. Other companies might enter the same market, ensuring some competition, but they would have to compete against the subsidized concessionaire. Also possible, however, is that only one company would emerge, as the same company could bid for both concessions. A tender for the concessions was launched but did not attract sufficient interest, largely because the costs are high, the ability to pay is low, and the grant was insufficiently attractive. The scheme is being redesigned.

Nonexclusive area concessioning is also used in mini-grid or off-grid schemes, such as for village mini-grids or household photovoltaic systems, with the rights granted to firms resembling a license or dealership. Such schemes should aim to build the delivery capability of local private firms to sustain the connection rate and ensure equipment maintenance. They can provide incentives based on installations achieved or on equipment subsidies. More advanced forms focus on energy service companies, which provide consumers both equipment and ongoing maintenance for a regular fee. The companies also provide the financing for consumers, supported by a grant or equipment financing.

The concession approach appears attractive because it offers instant market aggregation, keeps transactions costs for the government relatively low, and simplifies the flow of finance. But in isolated rural areas markets may be neither large nor viable enough to attract substantial private participation and competition for the market at any level of subsidy. An alternative is to build delivery capability among small enterprises through business advisory services and business development and working capital financing. This approach, though initially slower, may ultimately be more financially sustainable. One variation of this approach, the "dealer sales" model for delivering household solar systems, is being tried in a number of countries, particularly in Asia, such as Bangladesh, China, and India.

Exclusive and nonexclusive concessions differ in the information rights and incentives they provide for identifying viable projects ("prospecting"). In an exclusive concession the concessionaire has the right to supply all consumers in a defined area but also the obligation to connect consumers. To determine whether extending the grid is economic and what it will cost, the concession-

aire needs to carry out preinvestment studies. In return for bearing the cost of these studies, the concessionaire gains exclusive right to the information.

For nonexclusive concessions, the information about prospective connections needs to be publicly available, so private companies would not be keen to carry out such studies. If public bodies provide the information (as the rural electrification office in Panama does), the costs of gathering the information could be subsidized, with the subsidy linked directly to the number or size of areas mapped.

Monitoring performance and ensuring accountability

Concessions and other models for subsidized private participation in rural electrification create a contractual relationship for carrying out such obligations as extending the grid at a specified rate, connecting new customers, meeting investment targets, and installing off-grid equipment. These obligations need to be monitored and enforced—by the local authority granting the concession, a national regulator, a rural electrification agency, or even the utility (for technical standards, for example). One well-tested approach is to have a dedicated rural electrification agency carry out the monitoring. The agency can also play a supporting role, acting as a catalyst for private sector and local participation and providing financial, technical, and managerial support. A dedicated, independent agency can provide a focused supporting framework for the effective disbursement of performance-related subsidies.

Where a demand-based approach is adopted, as in Chile, the local community will feel a close link to the scheme and can be expected to alert regulators or the government if promised programs are not delivered. Panama's scheme, which disburses subsidies in phases based on a schedule for connections, relies on random audits instead. But once a project is connected to the main grid, it becomes the responsibility of the distribution company, and the project area is regulated just as any other area would be. Isolated grids are regulated by contract with local communities. A similar arrangement is used in Chile.

In Cape Verde it was originally hoped that using multiple concessionaires, and thus introducing competition, would mean that prices to users would not need to be regulated. But with the redesign aimed at making the concessions more attractive, in part by reducing the threat of entry by competitors, it is now expected that stronger regulation of prices and standards will be needed.

Conclusion

Why has output-based contracting been so limited in electricity? Several factors play a role:

- Output-based contracting is best implemented by an organization in close touch with local conditions. But until recently most utilities have stayed under centralized control, and the stringent technical (safety) standards required tends to keep centralized utilities involved even where local participation is strong.
- The large funding required for rural electrification subsidies (including donor funding) has usually been administered centrally. In addition, utilities have found it hard to move away from using "hidden" cross-subsidies.
- The remoteness and small scale of individual connections have made it hard to put in place an effective monitoring system for measuring performance against output targets.

The experience with contracts using output-based elements suggests several lessons. Delegating responsibility for evaluating and selecting schemes to the lowest practicable administrative level (as in Chile and Panama) helps to ensure that the projects selected are those most likely to be financially viable. And combining demand-based project selection with community responsibility for a substantial share of project costs (by using tariffs that are not too heavily subsidized, as in the Philippines, or by encouraging the community to bear some of the investment costs, as in Chile) helps to ensure that projects achieve output targets.

There is strong evidence that subsidies should be directed toward access to electricity rather than consumption. Investment subsidies can directly link the disbursement of aid to the most important output indicator—the number of newly electrified villages or new household connections.

Competition for grants can lead to the lowest capital subsidy per new connection and create incentives to minimize operating costs. State-owned companies serving rural communities and cooperatives face no direct pressure to keep costs low unless the regulator, government, or municipality is vigilant. Private companies, having won a competition at a fixed or regulated tariff, have their own incentives to minimize costs.

Concessions, grant competitions, demand-based project selection, and disbursement against milestones are all promising approaches. Many variants on these methods are possible, and indeed, approaches will need to be fine-tuned to fit each country's circumstances. Strong supporting measures can enhance success, including a sound investment climate and an agency dedicated to promoting efficient, financially sustainable schemes of rural electrification.

Educating mothers for health

Output-based incentives for teaching oral rehydration in Bangladesh

Sadia Chowdhury

Sadia Chowdhury (schowdhury@worldbank.org) is a senior health specialist at the World Bank. Before joining the Bank in 1998, she worked as director of the Health and Population Division of the Bangladesh Rural Advancement Committee (BRAC), a nongovernmental development organization with an annual budget of US$131 million and more than 25,000 full-time staff. Together with Oxfam, BRAC funded and ran a trial of the oral rehydration program. Bilateral donors funded the subsequent rollout of BRAC's large-scale program, run in three phases over 10 years.

Reducing infant deaths from diarrheal diseases poses a major challenge in many developing countries. Education of mothers can be an effective way to address this challenge, but it is time-consuming and often difficult to monitor. In Bangladesh a nongovernmental organization launched an education program aimed at teaching mothers how to prepare and use oral rehydration solution to treat diarrhea. To ensure that the teaching was effective, the program relied on output-based incentives, tying field-workers' pay to fast-cycle feedback on performance against output indicators. Monitoring results show that the approach worked: the mothers learned effectively. And over 10 years the program reached 12 million households.

Diarrhea was the leading cause of infant mortality in Bangladesh during the 1980s. Diarrhea leads to the loss of fluids and electrolytes, resulting in mild to severe dehydration and, in some cases, death. Because it is the loss of fluids and electrolytes that causes illness and death, it is essential that they be replaced. Intravenous therapy is critical for treating cases of severe dehydration, but the means are expensive and difficult to transport. A severely dehydrated person would require 5–10 bags of saline. One bag cost 100 taka (Tk) in Bangladeshi villages in 1983, when the average income was Tk 1,500 a year (Chowdhury and Cash 1996; Shepard, Brenzel, and Kenneth 1985). Moreover, administering this therapy requires sterile fluid, needles, tubing, and trained professionals.

Choosing the solution

Seeking a solution, the Bangladesh Rural Advancement Committee (BRAC), a nongovernmental organization, realized that what was needed was an inexpensive therapy easily administered by nonprofessionals using no special equipment. BRAC saw that the best option was a fluid that could be given orally, which would eliminate the need for sterile equipment. An oral rehydration solution was developed in Bangladesh, clinically tested, and perfected so that it was effective in treating dehydration from all types of diarrhea in infants and children, even cases of severe dehydration, as long as the children were alert and could drink the fluid. To work, though, the solution needed to be available in the community and used effectively as soon as an episode of diarrhea began.

At this stage BRAC weighed several options for a diarrhea prevention program:

- Having trained personnel provide treatment at fixed government facilities.
- Providing safe water and sanitation.
- Making packets of oral rehydration solution broadly available through commercial outlets.
- Teaching mothers how to make the solution at home with commonly available ingredients.

A treatment program relying on trained personnel was rejected because there were too few facilities and health workers. An effort focused only on improving water and sanitation was also rejected, because experience with tubewell programs to supply safe drinking water showed that when the wells were broken, people resorted to unsafe sources of water.

Marketing packets of oral rehydration solution had many advantages. The product was easily identified, it was a complete mix, and it could be eas-

ily distributed to all small shops. But it was impossible for Bangladesh to produce the volume needed. Treating all episodes of diarrhea only in children under five—79 million in 1989—would require about 200 million packets a year. The government had the capacity to produce only about a third of that. Moreover, the annual cost of US$16 million was onerous.

Commercial production and marketing of packets also appeared impractical, as people had limited purchasing power and the distribution system was weak. Moreover, the printed instructions for mixing and administering the solution could not be read by the 80 percent or so of the population who were illiterate. But the main flaw of a commercial initiative was that it would not include efforts to build people's awareness of the deleterious effects of diarrhea and the effectiveness of oral rehydration solution in combating it—crucial in overcoming social and cultural barriers to the solution's use.

For all these reasons, the option chosen was to teach mothers to prepare an oral rehydration solution and treat their children themselves. So in 1980 BRAC launched a pilot program supported by its own funds and by Oxfam. After the pilot the teaching program was rolled out in three phases over 10 years, with the US$9.3 million cost funded by different donors. The donor funding was disbursed every quarter as a reimbursement of expenditures. The cost of teaching each household was estimated at US$0.75.

Teaching mothers

The teaching program had three aims:

- To reduce diarrhea-related illness and deaths, particularly among children under five.
- To teach at least one woman in each household to prepare the oral rehydration solution.
- To raise awareness in the community about diarrhea prevention.

Using mainly one-on-one and group communication techniques, this program taught a 10-point health message, including how to prepare the solution using local ingredients and a simple but accurate measuring system (box 1). The solution is prepared from a three-finger pinch of *lobon* (common table salt) and one fistful of *gur* (unrefined brown sugar) in half a *seer* (467 cubic centimeters) of water. The *lobon-gur* solution has almost all the essential properties: it is simple, cheap, safe, effective, and readily available (BRAC 1980).

The female health workers teaching women how to prepare the solution first had to overcome some suspicion and confusion. They had to convince villagers that the solution was not harmful. And because the last time health

Box 1 What the program taught each mother

- What diarrhea is and how it is transmitted.
- How to prepare the rehydration solution.
- What can go wrong if the quantities are not right (too much salt, too large a dose).
- When to consult a doctor.

workers had appeared in villages was to teach family planning, they had to overcome an assumption that the solution was a contraceptive.

In the program's first phase most health workers were from the district where the program was being implemented. This allowed the health workers access to their families, and it eased communication with mothers, since the health workers could talk to them in their own dialect. The health workers had to be 20–35 years old and have at least 10 years of schooling.

Teams consisting of 14–16 health workers and a team coordinator worked together in a village (unless a village was small). They visited all the households, with each worker covering an average of 10 a day. Before leaving a household, they made sure that the mother had understood the messages by asking questions about each of the 10 points. Most important, they had the mother make the solution. The health workers reviewed the accuracy of the measurements and then asked the woman to repeat the process. If a health worker was dissatisfied with the woman's level of understanding, she repeated the entire session. Each session took about 20–30 minutes. By December 1990 the health workers had reached two-thirds of the country's rural households—around 12 million.

Creating incentives through the salary system

There was concern that a normal monthly salary system would make the health workers more task oriented than results oriented, particularly as the program began to expand. So an incentive system was developed that linked their earnings to results—mothers' knowledge of diarrhea and their ability to prepare the solution.

A monitor visited 10 percent of the mothers a health worker had taught over the past month, asked them questions about the 10-point message, and had them prepare the solution. To determine the health worker's pay, the mothers' responses were graded from A to D and the number of mothers receiving each

grade was multiplied by 10, since only 10 percent were interviewed. For each A the health worker received Tk 4, and for each D, nothing (table 1).

This salary system put the emphasis squarely on ensuring that mothers learned correctly. During the pilot phase health workers received Tk 600 a month on average (US$40 at the 1980 exchange rate, a good income in rural areas). The range was Tk 400–700. With the minimum salary set at Tk 250, much of the pay was based on performance. (There was no incentive-based salary system for male workers, and questions were raised about gender bias.)

The incentive system improved teaching methods. Before it was introduced, only the health workers prepared the solution during a teaching session. But the performance-based salary increased their incentives to ensure that the mothers had learned to prepare the solution correctly, so the health workers began to ask the mothers to demonstrate. This also increased the mothers' interest in the teaching session.

Monitoring and evaluating results

The program's results were monitored both internally and externally in all phases. Monitoring costs were estimated at about 4 percent of project costs.

Internal monitoring

The salary system required an effective, built-in monitoring system. During the pilot phase each health worker gave a list of the mothers she had taught that day to her supervisor, who randomly selected 10 percent of the mothers and assigned a monitor to interview them. Men were recruited to work as monitors, as the job required extensive travel.

TABLE 1 Rate paid for each grade

Mother's performance	Grade	Rate (taka)
Remembered all 10 points and prepared the solution correctly	A	4
Remembered 7–9 points and prepared the solution correctly	B	2
Remembered fewer than 7 points but prepared the solution correctly	C	1
Failed to prepare the solution correctly	D	0

Note: In 1981 the rates for grades B and C were increased by Tk 1.
Source: Chowdhury and Cash 1996; BRAC 1984; Bhatia, Cash, and Cornaz 1983.

In the expanded program the selection of mothers had to be done at a higher level and the monitors kept separate from the health worker teams to prevent collusion. The lists were sent to Dhaka, where monitors were randomly assigned to visit 5–10 percent of the mothers a month. One technique used to ensure the veracity and accuracy of the monitors' reports was to ask them to record the name of each mother's youngest child. This information was then compared with that collected by the health worker to confirm that the monitor had visited the right mother.

BRAC's Research and Evaluation Division played an invaluable role in helping the program to continually increase its effectiveness. An emphasis on evaluation as a means to improve results rather than to punish the workers helped to create a positive attitude. The division encouraged field-workers and supervisors to suggest ways to improve the system, and their ideas often led to research that helped to verify field observations.

External monitoring

The monitoring also required an analysis of the solutions prepared by the mothers. For this purpose, the International Center for Diarrheal Disease Research helped BRAC set up field laboratories. As a quality control measure, the center reanalyzed 10 percent of the samples. In addition, its staff made routine supervisory visits to the field laboratories (Chowdhury and Cash 1996).

During periodic visits a technical advisory committee of international experts provided valuable technical assistance to the program. And the donors conducted independent assessments of the program at the end of each phase.

Conclusion

Monitoring showed that 90 percent of mothers scored in the A and B categories. Two years later only 65 percent of these mothers scored A or B. To increase retention, follow-up education was introduced on local radio and television and in schools. Mortality rates fell after the program was implemented, but it is hard to isolate the effects of the oral therapy from other factors.

Analysis showed that the program had characteristics that allow scaling up: It dealt with a problem common to all of Bangladesh. The intervention was relatively simple. It was also inexpensive, requiring households to purchase only salt and *gur*. The training and messages built on existing skills and knowledge, such as cooking and child care, and were culturally acceptable. The health workers' performance could be measured through the knowledge

acquired by mothers. Though the program was large, it was possible to put in place an administrative structure of checks and balances and rigorous supervision. Finally, the program had a clear goal and specific outcome indicators.

BRAC's experience with the output-based salary system shows that the approach can be successful in certain circumstances. First, the outcomes sought must be tangible and quantifiable. Second, there must be an independent monitoring unit, something that many organizations may not have. And third, it must be possible to dismiss nonperforming employees rather than reassigning them to other positions, as required by labor laws in many countries. BRAC has only recently begun to use the technique again—in a community-based education program with four clearly defined HIV/AIDS messages.

References

Abed, F. H. 1999. "Development Cooperation on the Brink of a New Century: What Role for NGOs?" UvA Development Lecture. Amsterdam Research Institute for Global Issues and Development Studies.

Bhatia, S., R. A. Cash, and I. Cornaz. 1983. "Evaluation of the Oral Therapy Extension Programme of the Bangladesh Rural Advancement Committee." Swiss Agency for Development and Cooperation, Bern.

BRAC (Bangladesh Rural Advancement Committee). 1980. "Oral Therapy Extension Program Phase I." Dhaka.

———. 1984. *Report of Phase I of the Oral Therapy Extension Program.* Dhaka.

Chowdhury, A. M. R. 1986. "Evaluation of a Community-Based ORT Program in Rural Bangladesh." Doctoral thesis. University of London.

Chowdhury, A. M. R., and R. A. Cash. 1996. *A Simple Solution: Teaching Millions to Treat Diarrhoea at Home.* Dhaka: University Press.

Shepard, D. S., L. E. Brenzel, and K. T. Kenneth. 1985. "Cost-Effectiveness of Oral Rehydration Therapy for Diarrheal Disease." Harvard School of Public Health, Institute for Health Research, Boston.

Promoting preventive health care

Paying for performance in Haiti

Rena Eichler, Paul Auxila, and John Pollock

Rena Eichler (reichler@msh.org) is a health economist at Management Sciences for Health (MSH), a U.S.-based nongovernmental organization working in developing countries. She is based in MSH's Washington, D.C., office and has worked on performance-based payment schemes in Haiti and Kenya. Paul Auxila, also at MSH, leads the Haiti project. John Pollock provides U.S.-based support to the Haiti project from MSH's central office in Boston, Massachusetts.

In Haiti nongovernmental organizations provide basic health services such as immunization and prenatal and maternal care. In an effort to improve the effectiveness of some of these organizations, the U.S. Agency for International Development introduced performance-based contracting in 1999. The providers had been operating under a payment system that reimbursed their expenses up to a ceiling. The new system set performance targets and withheld a portion of their historical budget, allowing them to earn back the withheld amount plus a bonus if they met the targets. A one-year pilot involving three of the providers showed some marked improvements in performance.

Those paying for health care services in developing countries typically have not required the providers to guarantee their performance. Public payers tend to fund public institutions to maintain capacity (paying salaries and recurrent costs) rather than to ensure that consumers receive high-quality services. Any contracts with private providers generally have not held them accountable for performance. Donors have tended to adopt similar practices, providing lump sum grants or reimbursing public providers and nongovernmental organizations (NGOs) for documented expenditures. As a result, providers tend to focus on securing funds rather than improving efficiency or the quality of care.

In this context, in 1995 the U.S. Agency for International Development (USAID) launched a 10-year project in Haiti aimed at strengthening the capacity of NGOs to deliver primary health care services. A key part of this effort was the introduction of a performance-based payment system. The challenge was to develop a system based on attainment of goals without imposing an excessive burden of monitoring and reporting requirements.

Following competitive tenders, USAID awarded funding for the two-phase, US$92 million project to Management Sciences for Health (MSH), a U.S.-based NGO operating in developing countries. MSH manages and disburses the funds. During the first five-year phase, beginning in 1995, the project provided funding to 23 NGOs, an established group that had received USAID support in the past. For the second five-year phase, beginning in 2000, the number of NGOs increased to 33.

When the project began, the immediate need was to develop rapid mechanisms for funding NGOs so that they could provide critical basic health services, including maternal and child health and family planning services. Initially, and in line with general practice, NGOs were reimbursed for expenses up to a ceiling that was essentially a negotiated budget. Under this expenditure-based financing NGOs submit a proposed annual budget and a plan showing how they intend to ensure the delivery of a basic package of services. Then each month they submit cost reports with detailed documentation of their expenditures for reimbursement. NGOs are free to set their own fees for services. Most charge patients for drugs, and some for consultations.

Switching to performance-based contracts

A 1997 population-based survey to review the existing system found that NGO performance was extremely uneven. In vaccinations a good performer reached 70 percent of the target population, while the worst performer

reached only 7 percent. One NGO made sure that 80 percent of women knew how to prepare an oral rehydration solution; another educated only 44 percent. Some NGOs provided the minimum two prenatal visits to 43 percent of pregnant women; others reached only 21 percent. These wide-ranging results were not correlated with costs (average costs per patient visit ranged from US$1.35 to US$51.93).

So in 1999 MSH decided to test a new approach—performance-based payment. The new payment system was expected to lead to efficient delivery of high-quality services in several ways:

- Because institutions receive a bonus if they achieve performance targets, they feel strong incentives to attain those targets.
- Because institutions assume financial risk for improving performance, they feel strong incentives to use resources efficiently and effectively.
- Because institutions are paid on the basis of results, they face strong incentives to improve management, motivate staff, and innovate.

Three NGOs, serving about 534,000 people, participated in a one-year pilot study. Under the performance-based system NGOs receive an up-front payment and then a quarterly sum rather than submitting their expenditures every month. At the end of a defined period—one year in this case—performance is measured and the size of the bonus determined.

To ensure that the NGOs viewed the change as advantageous, MSH used a collaborative approach in designing the new system. NGOs demonstrating the leadership and institutional capacity to respond to the system were invited to meetings to express their views about the pilot. Because these meetings occurred after NGOs had signed contracts for fiscal 1999 (October 1998–September 1999), they were willing to renegotiate only if the new contract could make them better off.

The meetings led to agreement on a new contract that would pay 95 percent of the budget under the expenditure-based contract—but would also pay a bonus of as much as 10 percent of that budget. The NGOs thus assumed a financial risk: if they failed to attain performance targets, they would lose 5 percent of the budget under the original contract. But they were willing to do so because they also had the possibility of earning 5 percent more than the budget.

Seven performance indicators were chosen, and a target was negotiated for each indicator and linked to a share of the bonus (table 1). (Negotiating with MSH, each NGO then translated the general targets into specific targets.) Five indicators related to improving health impact,

TABLE 1 Performance indicators, targets, and weights in bonus

Indicator	Target	Share of bonus
Women using oral rehydration therapy to treat diarrhea in children	15% increase	10%
Children ages 12–23 months receiving full vaccination coverage	10% increase	20%
Pregnant women receiving at least 3 prenatal visits	20% increase	10%
Discontinuation rate for oral and injectable contraceptives	25% reduction	20%
Clinics with at least 4 modern methods of family planning; outreach points with at least 3	100% of clinics; 50% of outreach points	20%
Average waiting time for attention to a child	50% reduction	10%
Participation in local health organizing committee (UCS) and coordination with the Ministry of Health	UCS defined	10%

Source: Authors' compilation.

one to increasing consumer satisfaction by reducing waiting time, and one to improving community participation and coordination with the Ministry of Health.

Another goal of the project was to improve institutional sustainability. To facilitate learning and sharing, the project helped create a network of local NGOs. Regular meetings encouraged NGOs to share strategies that have succeeded or failed in the challenging Haitian environment. The project also provided technical assistance, to help NGOs review their pricing policies and develop a plan to generate revenue through sources unrelated to health services. CORE, a cost and revenue analysis tool, was used to help NGOs identify unit costs, revenues, and staff utilization (MSH 1998). The goal was to promote a culture of information-based decisionmaking to improve efficiency.

Measuring performance

Since payment is tied to performance, the NGOs agreed that reporting on their own performance would create incentive problems. MSH contracted a neutral third party—l'Institut Haitien de l'Enfance (IHE), a local survey research firm—to measure baseline and end-of-pilot performance.

Using the standard cluster sampling methodology recommended by the World Health Organization (WHO 1991), IHE sampled households in each NGO's service area to measure immunization coverage, based on both immunization cards and reports from caretakers. IHE determined the percentage of women using oral rehydration solution to treat diarrhea through exit interviews at clinics with women who brought children in for other reasons. It reviewed a sample of medical records to find out what share of pregnant women had had three or more prenatal visits. Discontinuation rates for oral and injectable contraceptives were determined by reviewing family planning registers to identify women who had discontinued use, had not chosen another method, and had not expressed a desire to have a child. And average waiting time was determined through measures in a sample of institutions at different intervals.

This survey needs to be done annually, first to set up a baseline and then to check performance against this baseline. The annual cost is US$40,000, less than US$1 per person benefiting from the project.

The results one year later

The most striking result was the increase in immunization coverage in all three NGO service areas (table 2). In two of the three areas the share of mothers who reported using oral rehydration therapy increased—and so did the share who reported using it correctly. Performance was relatively weak in meeting prenatal care and contraception targets, probably because of the need for ongoing counseling and behavioral change. The availability of modern contraceptive methods increased substantially.

Waiting time was judged to be an invalid indicator of quality because people who have to travel long distances to obtain lab tests might wait an entire day for results rather than come back. A new indicator of client satisfaction is being developed for the next phase. And because no easily measurable and verifiable indicator could be devised for community participation and collaboration with the Ministry of Health, the bonus linked to this performance indicator was given to all three NGOs.

All the NGOs in the pilot received more revenue than they would have under the expenditure-based scheme—and all supported continuing performance-based payment. The shift from justifying expenditures to focusing on results inspired them to question their model of service delivery and experiment with changes. The NGOs' possibility of earning bonuses sharpened staff's focus on achieving goals and led to innovation, including greater efforts to involve the community.

TABLE 2 Results of performance-based payment pilot

Indicator	NGO 1 Base	NGO 1 Target	NGO 1 Results
Percentage of women using oral rehydration therapy	43	50	47
Percentage of women using oral rehydration therapy correctly	71	80	81
Immunization coverage (percentage of children ages 12–23 months)	40	44	79
Prenatal visits (percentage of pregnant women with at least 3)	32	38	36
Contraceptive discontinuation rate (percent)	32	24	43
Clinics with 4+ modern family planning methods	6	9	9

Note: Base data refer to September 1999, results to April 2000.
Source: Authors' compilation.

To motivate staff to focus on results, two of the three NGOs introduced bonus schemes for staff. And one introduced a bonus scheme for community health agents, cutting their salary in half and reserving the rest for bonuses tied to performance. But when it found that transferring this much risk to relatively low-paid staff lessened their motivation, it increased the fixed share of payment and reduced the share from bonuses. Another NGO set up a bonus scheme for local organizations with which it works, and all considered allocating a share of any bonus they earn to clinics in their network on the basis of performance.

The performance-based payment also motivated NGOs to request assistance in strengthening their strategic planning, strategic pricing, cost and revenue analysis, human resource management, and measurement of client perceptions of quality.

The future

The results of the pilot suggest that performance-based payment is a powerful way to hold NGOs accountable for results. The challenge is to define indicators that relate directly to health impact, client satisfaction, and institutional sustainability and to measure and monitor performance in a way that is not prohibitively expensive.

MSH staff and the NGOs in the pilot will work together to develop new indicators and improve processes for measuring and verifying performance.

NGO 2			NGO 3		
Base	Target	Results	Base	Target	Results
56	64	50	56	64	86
53	59	26	61	67	74
49	54	69	35	38	73
49	59	44	18	21	16
43	32	30	26	20	12
2	5	5	0	5	5

More NGOs will be incorporated into the performance-based payment system each year. And to increase performance incentives, a model being considered for fiscal 2002 would reduce the share of payment based on historical budgets and phase in a capitation (a fixed payment for providing defined services to an enrolled patient) combined with rewards for results.

Note

This chapter is based on a longer paper by the same authors, "Performance-Based Payment to Improve the Impact of Health Services: Evidence from Haiti," available at http://www.worldbank.org/wbi/healthflagship/journal/index.htm.

References

MSH (Management Sciences for Health). 1998. *CORE: A Tool for Cost and Revenue Analysis.* Boston.

WHO (World Health Organization). 1991. *The EPI Coverage Survey.* WHO/EPI/MLM/91.10. Geneva.

Improving primary health care

Output-based contracting in Romania

Cristian Vladescu and Silviu Radulescu

Cristian Vladescu (cvladescu@buc.osf.ro) is executive president of the Center for Health Policy and Services in Bucharest and an associate professor in the Faculty of Sociology and Social Assistance of Bucharest University. Silviu Radulescu (sradulescu@worldbank.org) is a health specialist with the Europe and Central Asia Human Development Unit at the World Bank. Both authors were involved in the early design of health reforms in some of the Romanian districts piloting the new approach to primary health care. The pilot was part of a major project to restructure health sector financing and management. Begun in 1991, the project was supported by a US$150 million World Bank loan.

In 1994 the Romanian government introduced a pilot scheme of output-based contracts for the provision of primary health services. The contracts were aimed at supporting efforts to develop the independent provision of primary services, to increase the share of health spending going to preventive care, and to improve access to health services, especially in rural areas. To help achieve these objectives, the scheme relied on output-based financial incentives and competition between doctors for patients. The pilot resulted in higher patient satisfaction, more primary care services for patients, and higher incomes for doctors. But the weak regulatory and monitoring capability of the purchasing authorities diluted the benefits. Now, with modifications based on lessons from the pilot, the scheme has been extended across the entire country.

Under Romania's old health care system patients had little confidence in primary care services and often bypassed them, seeking care directly from specialist physicians and hospitals. Treatment was free, in theory, at the point of service for all levels of care—though many paid under the table for better service, especially for specialist care. Primary care doctors faced little incentive for giving preventive care or ensuring patient satisfaction. Their incomes (low compared with the average income, and much lower than doctors' relative incomes in OECD countries) were determined by seniority and length of service, with no link to the quality or volume of services provided. And patients were simply assigned to practitioners on the basis of their residence or employment. Fragmentation led to both gaps and overlaps in primary care services. And as a result of resource scarcity (public health spending averaged around 3 percent of GDP in 1990–97) and a distribution of power in favor of hospitals, primary care centers had even less access to drugs and equipment than other levels of care.

In the early 1990s Romania started to reform its health sector—to shift the balance from hospital services toward primary care, and from curative care toward preventive; to address inequities in access to basic services resulting from inadequate staffing (especially in rural areas) and funding; and to give patients choice over their doctor.

As part of the reform a pilot scheme introduced output-based contracts for primary care in 8 of the country's 40 districts, covering about 4 million people, between 1994 and 1996. The contracts anticipated moves to set up an autonomous national health insurance fund (financed by a 7 percent tax on salaries and a 7 percent levy on employers) and develop an accreditation system for health care providers to improve the quality of care.

Designing the payment system

The new contracting system used competition backed by financial incentives as a mechanism for shifting resources. In designing the contracts policymakers had to strike a balance: to avoid under- or overspecifying service requirements, to set workable and monitorable performance targets, to allow the flexibility to respond to demand, and to protect the funding system against abuse and budget blowouts.

In the eight pilot districts one-year service contracts were concluded between doctors and district health authorities, ending the doctors' status as hospital employees. The contracts covered primary health services (curative and preventive) for the patients registered with each doctor, and the services continued to be free. Doctors had to be accredited, but the criteria were basic

and contracts were offered to all general practitioners with an open-ended employment contract with public hospitals.

Patients were allowed to choose their family doctor and to switch after three months. To hold a contract, a family doctor had to have at least 500 registered patients (fewer would suggest poor service and would result in an inefficient allocation of funds to cover the fixed costs of running a medical practice). The optimum number of patients was deemed to be 1,500.

The payments to doctors combined a capitation adjusted for patients' ages (about 60 percent of the total) and reimbursement for about 30 fee-for-service items (about 40 percent). A capitation is a fixed payment for providing a list of services for a set period to an enrolled patient. Providers received the payment whether or not the patient used the services, so in principle they had an incentive to keep their patients healthy. The capitation was also meant to give physicians in areas with a surplus of providers an incentive to move to areas with a deficit, where it would be easier to build up patient lists. The balance between capitation and fee-for-service payments was calibrated so as to create incentives for both quantity and quality of service.

The capitation was increased for work in remote areas and difficult conditions (by 20–60 percent) and for professional qualifications (5 percent for specialists, 10 percent for senior specialists)—and reduced for not providing coverage at night (5 percent) or on weekends (10 percent). (The contract required 24-hour availability for emergencies.) These adjustments were designed as incentives to increase access in underserved areas and improve the scope and quality of services.

The contract provided no clear guidelines on what was expected for the capitation, however, and defined fee-for-service requirements only in general terms. The fee-for-service payments covered primary and secondary clinical preventive care, including periodic checkups, immunizations, pregnancy and child development monitoring, cancer and tuberculosis detection, and public health activities. These payments were expected to create a strong incentive to provide more preventive services, which are in lower demand.

To calculate payments to doctors, their outputs were converted into points reflecting relative values. To discourage doctors from registering too many patients, points were progressively reduced above two thresholds—by 50 percent above 1,500 registered patients and by 70 percent over 2,000. And to take into account the higher demand for services by infants and the elderly, these patients were assigned three to four times as many points as a young adult. The monetary value of a point was determined quarterly by dividing

the budget for paying family doctors in the eight districts by the points reported. The contract required doctors to submit monthly reports on changes in their patient list and on the number of fee-for-service items provided. District health authorities had the right to audit the doctors' records.

Assessing the results

The small number of indicators collected for routine monitoring has limited analysis of the pilot's results. Most data were collected for calculating payments and are in paper form rather than electronic, hampering their use. Moreover, most are aggregate, preventing before-and-after comparisons of such indicators as immunization rates and the share of patients getting pre- and postnatal checkups. A one-time evaluation in most of the districts showed large variations, reflecting inconsistent interpretation of what services are to be reimbursed and a lack of specificity in the guidelines.

The data that are available show steady growth in the share of the population registered with family doctors—from 72 percent in the first quarter to 82 percent after one year and 86 percent after two years—with registration averaging 8 percentage points higher in urban than in rural areas. (The rest of the people may be receiving no care or still seeking care at hospitals.) Few patients have changed doctors, though the number differed significantly among districts.

Two years after the pilot started the average patient lists in urban and rural areas were almost the same (about 1,740), although there were more people per physician in rural areas (2,125) than in urban (1,929). The smallest lists (the highest density of physicians) occurred in the urban areas of a poorer district (about 1,200) and the rural areas of relatively well-off districts (1,300–1,400)—and the largest lists in the rural areas of a poorer district (nearly 2,500). This pattern suggests that in poorer districts family doctors prefer to practice in urban settings, even though that means a lower income, and that better-off districts attract more doctors, who have to build up rural practices even if they live in towns.

Family doctors increased their output, providing 21 percent more consultations and 40 percent more home visits, and at the end of 1996, 87 percent were providing emergency coverage at night or on weekends. The doctors identified higher patient expectations as a major factor in their increased workload. Indeed, surveys revealed that family doctors had become more client oriented. And interviews of both doctors and patients provided some evidence of a reduction in informal payments (already relatively low at this level of care).

In the first months there was a tendency toward "inflation" of fee-for-service items. Payments for these exceeded the 40 percent initially estimated

as a maximum, so payment rules were changed and monitoring mechanisms strengthened. When fee-for-service points exceeded 65 percent of the capitation points, they were reimbursed at only 50 percent of their value. Auditing reports for reimbursement became a major task for the inspectors hired by district health authorities. Feedback from doctors suggests that the audits were uneven and erratic, reducing the credibility of the payment scheme.

For an average family doctor with a specialist qualification, caring for about 1,700 patients, the capitation accounted for about 65–70 percent of income and fee-for-service for the rest. Incomes increased by 15 percent on average (to about US$180–200 a month), with more than 80 percent of participating doctors experiencing an increase. The range of incomes also increased, with the top 5 percent earning more than four times as much as the bottom 5 percent.

Technical efficiency has increased in primary care, with output growing more than payments to service providers. But an effect on the overall efficiency of health services is difficult to prove. Although referrals to hospitals and polyclinics reportedly declined (by 8 percent in 1996), there are doubts about the quality of the data. There seemed to be no effect on hospital admissions, which increased by 3.6 percent in 1996, in line with the national trend (a 4 percent increase).

Weighing the prognosis

By introducing competition for patients, the scheme was expected to encourage doctors to expand their services rather than refer patients to hospitals, reducing health care costs. Although family doctors do report fewer referrals, there has been no significant change in hospital admissions. In urban areas with an adequate supply of doctors, however, competition does seem to be producing the desired results.

Still, a lack of influence on the utilization of hospitals and specialist care would not be surprising, since no disincentives to unnecessary referrals were built into the payment system. Moreover, most patients still expect to be easily referred to specialists, and therefore would find family doctors responsive to that expectation more attractive. Giving family doctors budgets for purchasing specialist services seems an attractive solution, but it would require the purchasing agency to have technical competencies for monitoring purchases. A more realistic solution is to focus on developing monitoring capacity in the purchasing agency and professional associations, improving equipment and increasing the range of clinical skills offered by family doctors, and changing patients' expectations.

The new delivery and payment arrangements had a positive effect on the quality of services. But the effect was limited by doctors' lack of control over resource management—which prevented them from influencing nurses' performance and improving the physical conditions of practice—and by the lack of incentives and conditions for professional development. Although the regulations for the pilot provided for a practice budget that would have allowed doctors to make autonomous decisions about expenditures on equipment or maintenance, in reality they had no possibilities for doing so because of budgetary constraints. Attendance by family doctors at training courses was poor, in part because of the lack of financial resources and a good system for ensuring that a substitute would be available.

The "optimum" list size of 1,500 patients proved too small to improve the distribution of family doctors, providing insufficient competition, and the disincentives over the threshold of 1,500 proved too steep. Further undermining competition, district health authorities turned out to be unwilling to make the "hard" decision of denying contracts to family doctors with small lists. Moreover, no mechanisms were designed to provide financial support for physicians moving to underserved areas, and the incentives from bonuses proved too weak.

The underspecification of requirements for the capitation led doctors to see it as an entitlement. Among fee-for-service items, the technical quality of some was questionable and difficult to monitor (such as cervical screening, routine examinations, and detection of breast and prostate cancer), and the frequency with which they were provided varied widely. This is unsurprising, given the lack of clear guidelines for these services, the inadequate equipment, and the uneven training of physicians.

After a new health insurance law came into effect in 1998, payment mechanisms similar to those piloted in the eight districts were introduced for general practitioners throughout the country for services contracted by newly established district health insurance funds. Lessons from the pilot led to some changes, however:

- To reduce the complexity of the capitation, the number of age groups and rates was reduced.
- Regulations on the capitation describe more clearly the services that need to be provided.
- The threshold above which the capitation is reduced was set at 2,000 (3,000 in localities with insufficient family doctors).
- A 100 percent bonus was added to the capitation for family doctors practicing in remote or low-income areas.

- For vaccinations, fee-for-service payments were simplified (awarding all vaccinations the same number of points), and family doctors can claim payments for vaccinating patients not on their lists (such as children temporarily residing or attending schools in the doctor's practice area).
- Requirements for routine checkups are more clearly defined.
- To reward effective intervention (rather than mere reporting of clinical activities of uncertain quality), more points are awarded for screening and detection of cancer and tuberculosis, but only after confirmation by a specialist physician.
- An allowance based on the number of registered patients was introduced to cover all practice costs. This allowance is managed by the doctors, who have gained significant discretion over spending on staff and maintenance.
- Rather than setting a cap on individual doctors' fee-for-service payments, the new system splits the primary care budget into allocations for capitation, fee-for-service, and practice budgets.
- The College of Physicians, established in 1997, has started to develop practice guidelines and requires doctors to participate in continuous medical education as a condition for periodic recertification. District-level accreditation committees have been established, with joint representation from the College of Physicians and district insurance funds.

The new health insurance system led to a 25 percent (real) increase in health spending in 1999 compared with the mid-1990s. This increase allowed a significant rise in doctors' incomes, the main element in primary care costs. But by the end of 2000 pressures from the increasing costs of drugs and hospital care were reversing the initial shift in resources toward primary care.

Conclusion

Romania's output-based payment scheme for primary care physicians, along with free choice of provider for patients, has the potential to improve the quality of services and increase doctors' productivity. But purchasing authorities operating in a weak regulatory environment, with insufficient capacity and experience, have faced serious difficulties in monitoring both the number and the quality of services reported (billed) by providers. The changes have not yet significantly reduced the use of hospital services or redistributed providers to improve access in rural areas. The system may need to establish more credibility before it can encourage patients to change their behavior and doctors to move to underserved areas.

Pursuing output-based education

The evolution of contracts for schools in the United Kingdom

David Goldstone

David Goldstone (david.goldstone@partnershipsuk.org.uk) is project director at Partnerships U.K. He has been involved in projects in the school sector and currently leads a joint venture with the National Health Service that will deliver new investment in primary care facilities and services. Partnerships U.K. is a joint venture between the public and private sectors but works exclusively for the public sector to develop, procure, and implement public-private partnerships.

The private sector has provided investment funding and services for U.K. public schools under output-based contracts since 1997. Under these contracts firms provide accommodation and related services, while teachers, still employed by the public sector, provide the core education services. Firms bid their lowest price, and payments to the winning bidder begin only when services become available at defined standards. The contracts have evolved from building new schools, to providing maintenance and rehabilitation across many schools, to setting up and supporting information technology systems while incorporating learning targets for students. Contracts focused on facilities can improve education outcomes, but only to a limited extent—raising questions about whether output-based contracting could be extended to education services.

New schools have traditionally been procured by local governments through input-based construction contracts specifying the inputs—or the entire design—in great detail. Once a school was built, the local authority and the school were responsible for managing and maintaining the asset and delivering such services as cleaning, catering, security, and utilities.

But the input-based approach has had a rather inglorious history of leading to delays in construction, significant cost overruns, and maintenance costs that became steadily less affordable. A key attraction of the output-based contract, pioneered in the United Kingdom by the Private Finance Initiative in the early 1990s for asset-intensive transport and government accommodation services, is its focus on outputs—what is required rather than how it is to be delivered (box 1). That transfers the risk of cost and time overruns from the school and local authority to the contractor, which is paid only when the outputs are delivered. In most cases the private contractor must raise finance in the private sector to cover the initial construction works.

Under this approach the contract goes beyond just the provision of the asset—the school. By transferring responsibility and risk for the ongoing management, maintenance, and operation of the asset to the contractor, it gives the contractor the incentive to develop design solutions that take into account the costs of managing the asset over its entire life. This ensures that the contractor does not design an asset that is cheap to build but unaffordably expensive to manage and maintain over the rest of its life—as the public sector often has in the past.

This approach offers important advantages to the government, not only more efficient risk allocation and access to private sector expertise but also the delivery of new assets without pressure on government resources. The

1 Public-private contracting for education services

Key features of the output-based approach:

- A competitive bidding process (reputable bidder with lowest price and best value for money wins).
- Specification of the outputs required, not the method of delivery.
- Procurement of a service, not the underlying asset.
- Allocation of risks to the party best able to manage them.
- Value for money as the overriding objective.
- Value for money assessed over the whole life of the asset.
- Payment for service as received, not as asset delivered.

approach started later in education than in other asset-intensive service sectors, largely because local authority regulations constrained it until 1996.

Moving from single to bundled contracts

The first stage of the Private Finance Initiative in U.K. schools was an output-based contract for a single school in the Dorset area of southwest England (table 1). This first contract set a precedent in defining outputs that has been widely followed as school projects have evolved. The contract defined output requirements in terms of the conditions that would make a room or space "available" for use, such as the level of lighting, heating, and ventilation. It also defined standards for ongoing services, such as cleaning, catering, and building and grounds maintenance.

The contractor's incentive to meet the requirements was established mainly through the fact that payment would occur only when the output standard was met. If a space (or the entire school) was not available for use, no payment relating to that space would be made. Deductions for nonavailability were weighted to reflect the operational importance of different areas—with faculty offices, for example, weighted less than classrooms. Deductions could also be made if rooms were available but the performance standards had not been met.

TABLE 1 Selected output-based schools contracts *in the United Kingdom*

Local authority and contract date	Schools	Requirement	Pupils	Value (millions of U.S. dollars)
Dorset, 1997	1	Replace secondary school	1,000	35.6
Stoke, 2000	122	Refurbish or replace all schools	38,000	185.0
Dudley, 1999	104	Provide managed information and communications technology service for all schools	44,000	49.8
Glasgow, 2000	29	Refurbish or replace secondary schools and provide managed information and communications technology service	30,000	540.6

Source: Author's compilation.

Payments are made in roughly equal installments (minus any penalties) from the date of first availability over the life of the contract. They are partially indexed to reflect the fact that some of the contractor's costs (such as running costs) will rise with inflation, while its capital costs will be incurred early in the contract, financed by borrowing at a fixed rate, and therefore do not require indexation.

The next step was to bundle groups of schools into one project. This approach offered a range of benefits, including lower transaction costs for both the public and the private sector. Several such projects are now in operation. The new facilities have generally been delivered on time and to cost and have met—and in some cases exceeded—expectations. But the projects have involved little innovation.

The next stage of contracting began to address this issue. The Stoke schools project, covering all 122 schools in Stoke on Trent, defined its requirements in terms of standards that should apply to categories of accommodation in any school, rather than school by school as in previous contracts. The specification document was brief—much briefer than those for many single-school schemes, which have typically given a lot of detail about such issues as site constraints and design aesthetics. Covering, as before, only such areas as thermal comfort, ventilation, lighting, and fixtures, the specifications defined for each standard a performance level that would make the accommodation available, a level at which it would be available but performance deductions could be made, and a level at which it was nonavailable and no payment would be made. By focusing purely on accommodation standards, the local authority gave the contractor complete discretion over how to meet the standards.

As a result of the Stoke project's focus on high-level outputs, the contractor's solution has shown much more innovation than those in many single-site schemes. For example, many schools that the local council expected to be refurbished or repaired are being demolished and replaced, because this solution is more cost effective over the 25-year life of the contract.

The payment arrangements in the Stoke scheme have higher-powered incentives too. If nonavailability continues for a long time or recurs often, the payment deductions can exceed the total payment for the affected space and start to eat into payments for other parts of the contract. Thus the contractor's incentive to meet the output requirements increases as its exposure increases.

Extending standards to learning

Contracts developed from the focus on school buildings to encompass the installation and maintenance of information and communications technology

systems across many school properties. These contracts have extended output requirements to education performance.

Output standards and incentive structures centering on education performance began with the Dudley Grid for Learning scheme. In this project the contractor is providing a managed information and communications technology service—an integrated network, with hardware (computer labs with personal computers and printers, a personal computer in each classroom) and software (word processing, spreadsheets), access to email and the Internet for everyone, school administration systems, user support such as data backup and help desks, and maintenance. The project includes refreshing the technology over the 10-year life of the contract and extending use of the facilities to the wider community to support lifelong learning and strengthen community links.

Payment for the service is based on performance against availability, usage, and learning gain targets. Availability payments are based on the availability of the required services and facilities for use at the required standards, and usage payments on the number of pupil log-ins during each school term. The usage payments are designed to give the contractor an incentive to make the service useful to pupils in doing their work: the more they use it, the more the contractor will be paid.

The learning gain payments increase over the life of the contract, after performance benchmarks are established in the early years. In the second half of the contract period, in years 5–10, 15 percent of the payment will be based on the impact on education outcomes. This impact will be assessed by an independent third party on the basis of such criteria as pupils' and teachers' attitudes about using technology in learning, attendance levels, and educational attainment, including performance on national achievement tests.

By including payments linked to education outcomes, the Dudley contract begins to match the contractor's objectives much more closely with those of the teachers. Equally important from the contractor's point of view, the risk related to education outcomes is a relatively small part of the total project risk and so is proportionate to the level of influence that the contractor's performance can have on education outcomes.

A more recent project, the Glasgow Secondary Schools Project, is unique in many respects, but its key feature is its strategic focus on achieving rapid improvement in education performance across the whole secondary school population in a big city. This project is the only one that has combined a whole system approach to accommodation requirements with a require-

ment for fully managed information and communications technology service. The Glasgow schools contract was signed at the end of July 2000 by the local council and the 3ED consortium. The principal service providers under 3ED's contract are a construction company, a business services firm, and several information and communications technology firms. The technology agreement will run for 12 years, and the accommodation requirements for 30 years. With the new technology installed almost immediately after the contract was signed, education benefits are already being achieved.

As in the Stoke project, the focus on outputs allows the contractor to opt for new construction as a way to meet the council's requirements for many of the schools in the scheme. The council had expected 2 of the 29 schools to be rebuilt, but the contractor is rebuilding 11.

The specifications and payments relating to accommodation requirements are similar to those in earlier school projects. But as in the Dudley project, the technology elements of the agreement require the contractor to enhance education performance, and payment is at risk if it does not. The main emphasis is on availability of the technology service. A sliding scale of penalties tied to the impact of the problems on the teaching process creates an incentive to ensure continuity of service.

The Glasgow contract also features a learning gain element, with deductions made if achievements in reading, writing, and mathematics (in national tests for pupils age 13) do not improve by agreed margins each year. This element accounts for only 5 percent of the payment linked to the information and communications technology, but it is significant in aligning the interests of the contractor with those of the teachers. As in the Dudley scheme, the contractor's risk relating to education outcomes is supposed to be proportionate to the influence it can bring to bear.

The contractor's current rate of progress suggests that all 29 Glasgow secondary schools will have been replaced, expanded, or refurbished—with fully managed information and communications technology services installed and operational—within two years of the contract signing. Moreover, according to the published comparator, the contractor will do all this for 9 percent less cost than the council could have if it had carried out the project itself.

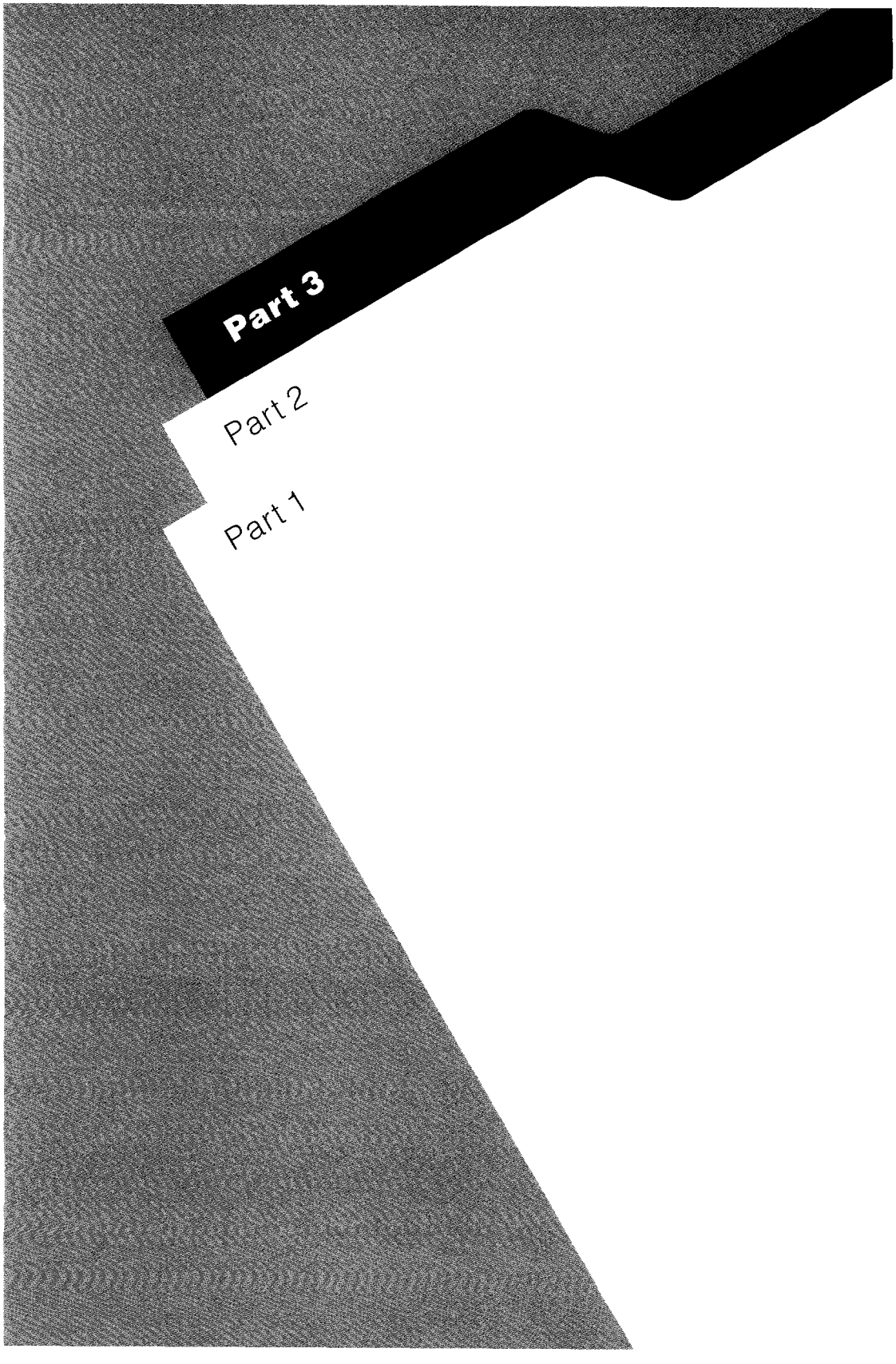
Could the scope be widened?

Better school facilities and up-to-date technology are widely recognized as beneficial in education—in boosting students' and teachers' morale and motivation, in making modern education methods possible, and in enabling teach-

ers to focus on teaching rather than dealing with failures in facilities or systems. In this way output-based schools contracts can have an impact on education outcomes—but only a limited one. Much more important than facilities and technology are the quality of teaching, the management of the school, and the nature of the school's intake.

Could the scope of education contracts be widened? To do so would require specifications and performance and payment regimes for contractors that focus on education outcomes for the pupils. In drawing up such regimes, local authorities would have to decide whether to measure performance against an absolute standard, based on, say, national targets, or against a target reflecting the schools' intake and historical performance. These would be difficult issues to resolve both technically—where to pitch the standards?—and commercially—how would the contractor respond to, and price, the risks involved?

Difficult issues touching on education policy would be raised—for example, relating to a contractor's ability to influence a school's intake or to exclude pupils, and to its employment policies for teachers. And contractors exposed to risk linked to education performance would want full control over the inputs that affect outcomes and so might challenge existing public sector approaches to delivering education services—a political hot potato.


Part 3
Part 2
Part 1

Designing output-based aid schemes: a checklist

Warrick Smith

Any discussion about designing output-based aid schemes must begin with an understanding of the underlying strategy—in particular, how it differs from traditional ways of funding and delivering public services.

Traditional approaches to providing health, education, infrastructure, and other public services channel public funding (whether sourced from domestic taxpayers or international development assistance) to the labor, materials, and other inputs consumed by state-owned monopolies, with at best indirect links between funding and the delivery of services. In the developing world especially, results have often been disappointing. Incentives for efficiency and innovation have been weak. Accountability for performance has been dismal. And opportunities for leveraging scarce public resources through private financing have been limited.

Output-based aid seeks to address these weaknesses by delegating service delivery to a third party under contracts that link payment to the outputs or results delivered. It thus has the potential to improve incentives and accountability while also expanding opportunities for mobilizing private financing. The focus shifts not only from inputs to outputs, but also toward the Holy Grail of development outcomes.

From strategy to implementation

The extent to which the potential benefits of output-based aid can be realized depends critically on the design of individual schemes. There are no standard models or blueprints, and approaches need to be adapted to the characteristics of the service and to the environment in which it will be delivered.

As with any policy intervention, the design of output-based aid schemes often involves tradeoffs between goals—such as providing high-powered incentives for efficiency, attracting sufficient interest from service providers, ensuring effective monitoring of performance, and minimizing

administrative costs. Further complicating design is that many issues are interrelated. For example, the definition of the service to be provided may be influenced by budgetary constraints—and in turn may influence the definition of eligible service providers, the amount and structure of payments, the duration of the contract, and the design of appropriate monitoring arrangements.

For these and other reasons, designing effective output-based aid schemes is neither simple nor mechanical. But while many of the issues are challenging, they are not altogether novel. Indeed, important insights can be gained from the solutions to similar issues in other areas, particularly in private infrastructure arrangements.[1]

To navigate the key issues in designing output-based aid schemes, it may be helpful to group them under eight headings—a checklist of major design questions:

- *Clarifying the role and sustainability of public funding.* What is the rationale for public funding? How might budgetary constraints and sustainability issues influence design?
- *Deciding who will be eligible to receive services that attract public funding.* Who are the intended recipients? How will they be targeted?
- *Deciding who will be eligible to provide services.* What criteria should govern eligibility?
- *Choosing the market environment.* Will services be provided in a competitive or monopolistic market?
- *Defining performance.* What should the service package include? How should key performance standards be defined?
- *Linking payment to performance.* What should be the form and size of payment? How will payments be structured?
- *Shaping other aspects of the contract.* What should be the form and duration of the contract? How will issues of contractual adaptation and dispute settlement be addressed?
- *Structuring the administration of the scheme.* What should be the scope of the scheme? Who should be responsible for administering the scheme?

Clarifying the role and sustainability of public funding

One of the hallmarks of output-based aid is a clear focus on the intended results. This means that policymakers and their advisers must clarify the reasons for public funding and consider the feasibility and sustainability of that funding from a budgetary standpoint.

Establishing the policy rationale for public funding

Many public services can be financed through user fees, without recourse to taxpayer or donor funding. This is increasingly the case for infrastructure services such as electricity, telecommunications, water supply, and many modes of transportation, and for many health and education services. But reliance on user fees alone can give rise to efficiency and equity concerns.

Efficiency concerns will arise if a service has characteristics that make individual preferences as expressed through user fees a poor measure of social welfare. For services that have "merit good" features—as some education services do, for example—consumption creates benefits for society in addition to those captured by individual consumers.[2] For these services, reliance on user fees alone would lead to underconsumption relative to the socially optimal level. For services that have "public good" features—such as public defense and public health interventions—the benefits from consumption are not depleted by additional users, and it is difficult or impossible to exclude people from the benefits even if they are unwilling to pay for them. For this reason, user fees usually are not a feasible financing strategy for services with the characteristics of pure public goods.

Equity concerns will arise if reliance on user fees limits the ability of the poorest members of society to meet their basic needs. This is a particularly pressing challenge in the developing world, where 2.8 billion people live on less than $2 a day (in purchasing power parity terms). And these concerns can be particularly acute in rural areas, where providing services is often more expensive than in urban settings. Complementing user fees with subsidies can be an important part of strategies for promoting universal access to public services. The need for such support will have to be assessed case by case, however, taking into account the costs of providing the service and recipients' willingness and ability to pay for it (box 1).

Questions to consider

- Can the service be adequately funded from user fees alone?
- When public funding is proposed on the basis of "merit good" considerations, has the gap between recipients' willingness to pay and the expected social benefits been assessed?
- When public funding is proposed on the basis of "public good" considerations, has the basis for this claim been assessed?
- When public funding is proposed on the basis of affordability concerns, have recipients' willingness and ability to pay been assessed?

Box 1 Subsidies and affordability

Traditional approaches to pricing public services have often relied on untested assumptions about the willingness and ability of users to contribute to the financing of the services through user fees. For example, publicly provided infrastructure services in developing countries have typically been priced substantially below the full economic costs of supply, ostensibly to help the poor. But the main beneficiaries have tended to be the more affluent, with the poorest lacking access to any service or paying considerably more for poor-quality substitutes (see World Bank 1994).

In reviewing the need for subsidies for a public service, a first step is to assess users' willingness and ability to pay. One way to do this is through surveys, for which there are established techniques. Another is to look at actual expenditure on substitute services. In many developing countries, for example, the poor often pay prices for water from tankers or other informal providers that are 10–15 times the price for services provided through household connections by an efficient supplier.

Many societies espouse a goal that expenditure on certain basic services should not exceed a fixed percentage of household income. Chile's subsidy policy, for example, is based on a view that subsistence-level water and sanitation services should account for no more than 5 percent of a household's income. Governments considering such policies need to determine whether they can mobilize sufficient funding for the required subsidies in the near term.

Considering the sustainability of financing

Budgetary and donor resources are subject to many competing demands, placing practical limits on public funding for services no matter how compelling the policy rationale. The volume and sustainability of the funding available are therefore key considerations in designing output-based aid schemes, particularly for those involving multiyear commitments. These considerations may influence the size and focus of the scheme, including the services eligible for public funding, the amount of subsidies that can be paid, and the pool of eligible recipients. (For simplicity, the term *subsidy* is used here for public payments designed to address either efficiency or equity concerns.)

Sustainability considerations may be particularly important in choosing the action that will attract public funding. Subsidies for consumption typically require a long-term commitment unless they are directed to one-time events, such as immunizations, or are part of a transition strategy for moving to user fees that fully cover costs, as in Guinea's water sector (see chapter 3). In some

cases it might be more feasible to direct subsidies to household or community connections to such services as water and electricity, leaving consumption to be financed from user fees.

Well-designed output-based aid schemes can help ease budgetary constraints. Improving the targeting of subsidies and strengthening the incentives for efficiency can increase the impact of a given level of public funding. Schemes can also help mobilize private financing in support of service provision.[3] In Peru the rural telecommunications scheme required a subsidy of US$11 per inhabitant, but mobilized an estimated US$22 per inhabitant in additional private investment (see chapter 1). Indeed, in many cases even a relatively modest subsidy payment may be enough to make larger projects attractive to private providers. These factors, coupled with improved accountability for results, can also help reduce resistance to funding assistance programs among taxpayers and donors.

Questions to consider

- What is the budget envelope for financing subsidies for the service, and how long will that funding be secure?
- How will budgetary constraints influence the size and focus of the scheme, including the amount of subsidies that can be paid and the pool of eligible recipients?
- How will sustainability considerations influence the choice of action that will attract public funding?

Deciding who will be eligible to receive services that attract public funding

Both the policy rationale for public funding and budgetary constraints will influence the designation of people eligible to receive subsidized services. Where public funding is justified by merit good or public good considerations, the pool of intended recipients may include most members of society. Where subsidies are aimed at making services more affordable, the pool is usually smaller.

Precisely targeting the people to receive subsidies can be information intensive and costly. In some cases existing census or other data may provide reliable information for means testing of households. Where such information is lacking, some pragmatism may be required, with targeting strategies taking into account the costs of generating reliable information and the potential for errors of inclusion (including an unintended recipient) and of exclusion (excluding an intended recipient). In some cases area of residence may be a reasonable proxy for household income. This criterion determines eligibility for some subsidies in

Colombia, for example. And many rural electrification schemes simply assume that those living in rural areas are relatively poor (see chapter 5).

Subsidies can sometimes be designed so that recipients signal their eligibility. For example, if a subsidy is directed to a low-cost service option, more affluent citizens will be less likely to choose that option. Peru's rural telecommunications scheme directs subsidies to pay phones, in the knowledge that more affluent people will prefer the convenience of their own household or mobile phones. Similarly, subsidies directed to new household connections to infrastructure services will exclude those already connected. Recipients might also be required to take some positive action to qualify for subsidized services, such as registering with local authorities. And they might be required to meet some additional condition, such as paying a share of the bill, as in the water supply scheme in Chile (see chapter 2).

When the pool of potential recipients is large, some mechanism may be needed for determining priorities. In many parts of Africa less than 10 percent of the population has access to electricity. Where do you begin? One practical approach is to allow service providers to address the pool of potential recipients progressively, on the basis of cost and recipients' willingness and ability to pay user fees to complement the available subsidies.

The intended recipients—and the broader community—can also play other important roles in the design and implementation of output-based aid schemes (box 2).

Questions to consider

- When subsidies are justified by affordability concerns, how will intended recipients be identified?
- When the pool of potential recipients is large, how will priorities be determined?
- How will the perspectives of recipients and communities be incorporated into the design of the scheme?

Deciding who will be eligible to provide services

Output-based aid schemes need to mobilize competent service providers that respond to incentives for performance. What criteria should apply?

For some services, the eligible providers may need to be limited to those with certain technical qualifications—for example, adequate training to provide specialized health services. The definition of qualifications needs to take into account policy concerns about the nature of the service to be delivered, trade-

BOX 2 Involving recipients and communities

Traditional approaches to delivering public services have been dominated by the perspectives of public sector suppliers. Output-based aid creates opportunities for increasing the input and involvement of the intended recipients and the broader community in three ways:

- *Designing and evaluating schemes.* Recipients and communities can help clarify the need for subsidies and ensure that service specifications take into account local needs and preferences. They can also help evaluate the operation of schemes, especially important in pilot projects.
- *Providing services.* Small-scale entrepreneurs and community groups can in some cases play the role of service providers.
- *Monitoring services.* Where communities are not involved in providing services, they might play roles in monitoring and verifying the performance of service providers.

offs between cost and quality, and the effect on the supply response. Requiring unnecessarily high qualifications can increase the cost of service provision and reduce the number of potential providers. In some cases it may be necessary or desirable to offer training to expand the pool of potential providers.

The ownership and governance structure of potential service providers may be another important consideration in determining eligibility. Output-based aid schemes rely on high-powered financial incentives for performance, which means that service providers need to be motivated by such incentives, and also have the flexibility to adapt delivery processes and experiment with innovative financing arrangements. Effective contractual discipline and oversight require the service provider to be at arm's length from the scheme's administrators and from regulatory authorities. And effective competition—whether in the market for providing the services or in the bidding for monopoly franchises that attract public funding—requires a reasonably level playing field between potential providers.

Including incumbent public enterprises among eligible providers usually creates difficulties on all these criteria. Moreover, any private financing mobilized by public enterprises generally involves at least an implicit government guarantee, reducing the potential benefits of output-based aid. Private entrepreneurs and firms—local and foreign—more clearly meet these tests. Nongovernmental organizations or community groups might also be potential suppliers.

A range of other design issues also affect success in mobilizing effective supplier interest (box 3).

Questions to consider

- Is it necessary to impose technical qualifications for eligible service providers? If so, what is the appropriate level and form? Is it necessary to offer training?
- Does the definition of eligibility take into account the ownership and governance structures of potential service providers?
- How will other features of the scheme influence the ability to mobilize a supply response?

Choosing the market environment

Traditional approaches to delivering public services have relied on monopolistic supply arrangements. Output-based aid schemes allow more competitive approaches. The choice of approach has important implications for the incentives faced by service providers and the intensity of regulatory oversight required.

Advances in technology and in economic thinking are expanding the scope for competitive delivery of many services traditionally reserved for monopolies. Competition has become the norm in telecommunications and

BOX 3 Mobilizing a supply response

To be effective, output-based aid schemes need to attract competent service providers and, ideally, to mobilize private financing to complement public resources. These considerations need to be taken into account in designing all aspects of a scheme.

Particularly for new and innovative schemes, early efforts may be required to identify potential service providers and to obtain their input on the design of the scheme. Knowing their views on the feasible level of risk sharing, as reflected in such matters as the performance standards and the level and structure of payments, will often be critical to mobilizing an adequate supply response.

The scale of the scheme can also influence the level and source of supplier interest. Schemes requiring substantial investment and service commitments may be too large for local entrepreneurs in many developing countries, while small schemes will be less likely to attract interest from major international firms.

Finally, the credibility of the payment scheme may be critical to mobilizing private financing. Ensuring credibility requires thinking about the security provided by contracts, the choice of scheme administrator, and, in some cases, additional measures such as escrow accounts.

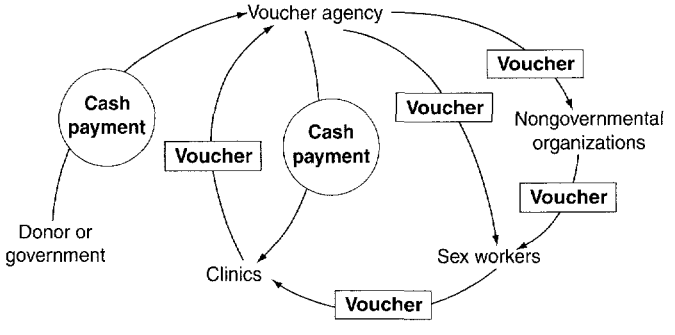
increasingly common in electricity and gas supply and in many modes of transportation. Competition is also being used to spur efficient delivery of a range of other public services, including education and health care. When feasible, competition between service providers improves incentives for efficiency, innovation, and consumer responsiveness while reducing the regulatory burden.

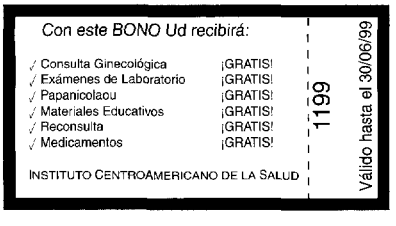
Under competitive approaches, service providers are compensated on evidence that they have served an eligible recipient. This evidence might take many forms, including vouchers that targeted recipients have

BOX 4 Using competition to improve health services in Nicaragua

Nicaragua has used a voucher scheme to support the delivery of health services to female sex workers since 1995 (before then, government clinics provided services). Targeted participants receive vouchers (see sample below) entitling them to a specified set of diagnostic and counseling services from their choice of preidentified clinics, which include both private (for profit) firms and nongovernmental organizations. The clinics redeem the vouchers for payment from the voucher agency. The voucher scheme is credited with expanding the use of the services, improving their quality, and reducing costs (Harper and others 2000).

How the voucher scheme works

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Source: Diagram adapted from Harper and others (2000); voucher from Instituto CentroAmericano de la Salud.

exchanged for services from their chosen provider. Vouchers are being used for a variety of public services, including health services in Nicaragua (box 4). Effective competition may require relaxing regulatory barriers to market entry and in some cases educating recipients or requiring service providers to publish information so that the recipients can exercise well-informed choice.[4]

Competition between providers may not be feasible in very small markets or where service delivery depends on investments with characteristics of a natural monopoly, which may be the case for some infrastructure services, for example. In other cases competition might be technically feasible but deliberately constrained—for example, where a monopoly structure is chosen to help mobilize private financing or to facilitate cross-subsidization between users or services.[5] Restricting competition when it is technically feasible is costly, however, particularly when access to services is low. The tradeoffs between competitive and monopolistic approaches thus need to be carefully evaluated in each case.

Where monopolistic service delivery is chosen, efforts are needed to ensure adequate regulatory oversight and to involve intended recipients more closely in the design of the scheme. The scope of the monopoly also needs to be carefully defined. Should there be a single national monopoly or a number of smaller, local monopolies? While a single national monopoly may offer potential economies of scale, this advantage needs to be weighed against the potential benefits of having several local monopoly franchises: a smaller financing burden on service providers, the ability to adapt approaches to local conditions and preferences, and the potential for using "yardstick" competition between providers. In choosing between a single monopoly and several, the size of the market and the significance of scale economies will often be decisive. Where contracts for monopolistic service delivery are being awarded, some of the benefits of competition can be obtained by tapping competition for the market (box 5).

Questions to consider

- Is competitive delivery of the service feasible? If so, what measures are needed to ensure that competition is effective?
- If monopolistic delivery is chosen, what will be the scope of the monopoly and what measures will be taken to ensure effective regulatory oversight and opportunities for input by recipients?

BOX 5 **Forms of competition in public services**

Output-based aid schemes might tap one of three forms of competition:

- *Competition in the market*—where service providers compete directly with one another to supply intended recipients. Where feasible, this form of competition usually offers the greatest advantages.
- *Competition for the market*—where potential service providers bid for the right to supply a monopolistic market under a time-bound franchise. Well-designed bidding processes can serve as a market test of the required level of funding. Rebidding franchises at the end of the contract period can help to sharpen incentives for performance.
- *"Yardstick" competition*—where comparative data on the performance of different service providers are used to simulate some features of competition in the market. For example, the relative performance of suppliers in different service areas might influence performance standards or be tied to the reward system to strengthen incentives for performance. Experience with this approach in infrastructure is potentially transferable to a wider range of public services.

Defining performance

The contract between the scheme administrator and the service provider must clearly define the services to be provided and the key standards of performance. The approach taken has important consequences for the costs of the scheme, the incentives faced by service providers, and the strategy for monitoring and verifying performance.

Setting the scope of the service package

The service agreement might cover a package of related services or focus on a single service. For example, health contracts might cover the full range of services available from primary care providers (as in Romania); a package of related services, such as immunization and prenatal and maternal care (as in Haiti); or a single service, such as training in oral rehydration therapy (as in Bangladesh). Education contracts might cover the delivery of education services or focus on the provision and maintenance of facilities used in delivering education (as in early schemes in the United Kingdom). In the roads sector in Argentina initial contracts included only maintenance but were later extended to rehabilitation as well.

The coverage of the service agreement will depend on the policy objective, budgetary constraints, and potential economies of scale and scope in putting together an integrated service package. It will also depend on the

implications for attracting supplier interest, as there may be tradeoffs between the breadth or depth of the service package and the amount of performance risk that can be transferred to service providers. For example, schemes seeking to shift significant performance risk to service providers may need to start with a more narrowly defined service package, expanding the scope as suppliers and their creditors become more familiar with the arrangement. This was the approach taken in the roads sector in Argentina and the education sector in the United Kingdom, for example.

Even when the service agreement covers a range of related services, it may be possible to focus the subsidy payment on a subset of services or actions when the service provider will have access to user fees. An infrastructure service agreement, for example, could cover a range of actions required in delivering services, but target subsidies to new household or community connections.

Questions to consider

- What services will be included in the service agreement?
- How will the breadth of the service package affect the amount of performance risk that can be transferred to service providers?
- When the agreement covers a package of services and the service provider will have access to user fees, is it desirable to focus subsidy payments on a subset of services or actions?

Specifying performance

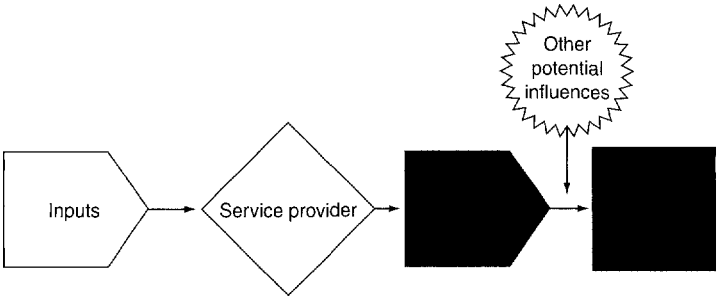
The services covered by the service agreement can be defined in different ways, with implications for the complexity of the contract, the incentives and performance risk faced by service providers, the cost of subsidies, and the ease of monitoring and verifying performance.

The definition of some services might involve only a few key parameters, such as inoculation with a specified vaccine through a clean syringe. For others, there might be a larger set of parameters. For many health services, for example, effective delivery might require diagnosis, testing, and counseling. Similarly, water supply services might involve consideration of the quality of water provided, the hours per day of availability, the pressure of delivery, responsiveness to service disruptions, billing arrangements, and a host of other matters. The number and nature of the service characteristics that potentially require definition will vary according to the service as well as the approach taken to incentives in the contract. In structuring incentives, it is important to distinguish between measures that focus on inputs, outputs, and outcomes (box 6).

BOX 6 Inputs, outputs, and outcomes

Performance under output-based aid schemes may be defined by reference to inputs, outputs, or outcomes.

- *Inputs* are the resources consumed in producing and delivering a service—such as labor, technology, or physical materials.
- *Outputs* are the immediate results of the service provider's activities—such as the number and quality of the health, education, or infrastructure services provided.
- *Outcomes* are the ultimate effects of services on the community—such as improvements in health or in educational attainment. Outcomes may be influenced by factors other than the activities of the service provider, which distinguishes them from outputs.



Measures focusing on outcomes and outputs create opportunities and incentives for service providers to discover new and better ways of achieving the desired results. A focus on education outcomes, for example, allows service providers to experiment with a range of approaches that achieve better results than traditional ones. A focus on outputs, such as the delivery of electricity services in rural areas, would give service providers opportunities and incentives to try new models of service delivery.

Outcome-related measures are also attractive because they directly target the larger social objective. But outcomes are often difficult to measure with precision and are usually subject to influences beyond the control of the service provider. Success in achieving an intended outcome of eliminating a particular disease, for example, might be influenced not only by the health services provided, but also by the actions of service recipients, the performance of providers of other services, and a range of other factors. And achievement of an intended outcome of improving educational attainment

might be influenced by such factors as differences between individuals and the support provided by families.

In these cases making the service provider's compensation completely dependent on outcomes would be inappropriate, and the high level of performance risk involved might deter potential service providers or lead to demands for larger payments. Nevertheless, some schemes link at least a small part of the service provider's compensation to outcomes beyond the provider's control to align its interests with those of the scheme administrator. For example, contracts for providing and maintaining school facilities in the United Kingdom link part of the payment to the impact on education outcomes, including attendance levels and educational attainment as measured by performance on national achievement tests (see chapter 9).

Measures focusing on outputs—such as the quantity and quality of services provided—are more clearly limited to matters within the service provider's control. Monitoring and verifying the quantity of services provided is relatively easy. But it can sometimes be difficult to assess the quality of those services without at least some reference to the inputs consumed. For example, it is often hard to evaluate the quality of professional services without reference to the qualifications of the provider. Similarly, when service delivery requires the construction or rehabilitation of long-lived assets that are intended to be transferred to the state at the end of the contract period, the scheme administrator may not be indifferent about the construction materials used. Of course, heavy reliance on input-related measures requires much more detailed contracts and limits opportunities and incentives for innovation. The tradeoffs between outcome-, output-, and input-related measures of performance thus need to be carefully evaluated in each case.

Reducing the number of defined service parameters can simplify contracting and monitoring. But the performance measures need to be chosen with care. In Haiti's health care scheme, for example, the waiting time in health clinics was originally included as a proxy for quality. But this indicator was found to be unreliable in a setting where people often must travel long distances for services and might wait an entire day for test results rather than come back (see chapter 7). When schemes focus on a subset of measures, they also need to ensure that this does not lead service providers to neglect other important matters or that it does not otherwise produce perverse results. In a scheme intended to promote recycling of household waste

BOX 7 **Establishing minimum quality standards**

Performance specifications need to incorporate judgments about the minimum level of service quality. Quality has a cost, however, and budgetary constraints may require careful evaluation of the tradeoffs, particularly when the alternative for intended recipients might be no service at all.

Schemes can sometimes be designed to allow recipients to choose a mix of price and quality that reflects their individual preferences and budgetary priorities. For example, a voucher scheme might allow recipients to choose from a range of service packages—and to "top up" the minimum entitlement by paying additional user fees.

In other cases schemes may need to establish a uniform set of minimum performance standards for a large number of recipients. When this is necessary, it is important to ensure that the performance specifications take into account the views of intended recipients. It might also be feasible to define different service packages for different service areas, to match local conditions and preferences.

in the United Kingdom, for example, focusing on the amount of recyclable material collected rather than the amount recycled resulted in carefully segregated waste being incinerated (U.K. National Audit Office 2001). And when contracts specify multiple service parameters, it may be appropriate to signal the relative importance placed on each, as health care contracts in Haiti do (see chapter 7).

Embedded in any set of performance specifications are judgments about minimum acceptable quality. There are important tradeoffs between quality and cost, however, and these need to be carefully evaluated in each case (box 7).

Questions to consider

- Will service requirements be defined in terms of outcomes, outputs, or inputs—or some combination of these?
- Can the number of defined service parameters be reduced without risking the neglect of other important matters or otherwise leading to perverse results?
- When service requirements are defined in terms of multiple parameters, how will performance against each be weighted?
- Do minimum quality standards reflect appropriate tradeoffs between quality and cost? Do they reflect the priorities of intended recipients?

Linking payment to performance

How an output-based aid scheme links payment to service delivery influences the cost of the scheme, the incentives and risks faced by providers, and the supply response mobilized, including private financing. Key questions relate to the form and amount of payment and to its structure.

Determining the form and amount of payment

Cash is the most flexible, most transparent, and, usually, most appropriate form of payment for service providers in output-based aid schemes. Noncash forms of compensation—such as tax credits or the conferral of special rights or privileges—are less flexible and transparent and can complicate the calibration of payment to results.[6]

In some cases governments might borrow from international financial institutions to finance the provision of subsidies, as the government of Guinea did for water consumption subsidies (see chapter 3). But using access to concessional finance as the sole form of "payment" to service providers under output-based aid schemes can be problematic. If the financing is made available only after the service has been delivered, the critical need for financing will usually have passed. If the financing is made available up front, incentives for performance are dulled and opportunities for mobilizing private financing are forgone.

The amount of payment required depends on the cost of providing the service to the specified standard, less any user fees from recipients. But the actual cost of providing the service is often unknown when a scheme is being designed. A first approximation could draw on benchmarks from incumbent suppliers. But by providing strong incentives for efficiency, well-designed output-based aid schemes lower costs. A recent survey of experience in contracting out services in OECD countries found cost savings averaging around 8–14 percent over a range of services, with savings of 50 percent or more in some cases (Hodge 1999). The actual savings depend on many factors, including the relative efficiency of the incumbent provider, the opportunities and incentives for innovation provided by the contract, the premium required by the service provider to compensate for payment or other risks, and the process used to award contracts.

The process for awarding contracts can be used to reduce costs and provide a market test of the amount of payment required. One strategy for doing so is to award contracts competitively to qualified service providers on the basis of the least payment required to provide the service.[7] In the rural

telecommunications scheme in Peru this strategy resulted in bids 41 percent lower than official estimates and 74 percent lower than an earlier offer from the incumbent telecommunications operator (see chapter 1).

Questions to consider

- Is there any basis for considering noncash forms of payment?
- What benchmarks will be used to estimate the likely costs of supplying the service to the required standard?
- Will contracts be awarded through a process that helps in determining (and minimizing) the payment required?

Structuring the payment

Output-based aid schemes that link payments completely to performance, and withhold payment until satisfactory delivery of services has been verified, create high-powered incentives for performance. Incentives can also be fine-tuned by deducting payments for subpar performance and including bonus payments for service that exceeds minimum requirements. Where multiple dimensions of performance are specified, payments can also be calibrated to reflect the relative weight attached to each, as in the health service contracts in Haiti.

In some cases it may be necessary to include some payment that is not dependent on performance, such as when the service provider is required to bear significant performance risks. This might also be necessary as a transitional measure where suppliers have traditionally been compensated on the basis of expenditures rather than outputs. In the health scheme in Haiti, for example, initially only 10 percent of service providers' compensation depended on performance. As service providers become more familiar with the system, it should be possible to reduce the share of payments unrelated to performance.

Even in schemes where payment depends fully on performance, it might be appropriate to share some risks between the service provider, the scheme, and even the service recipients. When the delivery of a service depends heavily on an input whose price tends to fluctuate, for example, a mechanism for adjusting payments or permitted user fees might be needed to reduce the risk faced by the service provider, particularly when longer-term contracts are involved. Payment might still depend fully on delivery, but changes in the cost of the key input could be reflected in the size of the payments or user fees. Care needs to be taken, however, to avoid reducing the service provider's incentives to negotiate hard with its suppliers.

A credible scheme assuring payment on delivery should help service providers mobilize the financing they need to deliver the services. But when significant investments are required and local capital markets are underdeveloped, some part of the payment may need to be made up front to ensure sufficient supplier interest at reasonable prices. For example, Peru's rural telecommunications scheme paid 35 percent of the subsidy at the start of the project and 25 percent once the facilities were installed (see chapter 1). Argentina's road rehabilitation and maintenance contracts included advance payments of 5–10 percent, followed by 15–25 percent at the end of the first six months, when specified activities had been completed, and 25 percent at the end of the first year, when rehabilitation works had been completed (see chapter 4).[8] When up-front payments are made, it may be necessary to obtain performance bonds or similar guarantees from service providers.[9]

The balance required between up-front and post-performance payment needs to be tested in each case, taking into account the investment required and the feasible level of private financing. This reinforces the importance of consulting closely with potential service providers when designing the scheme. The appropriate balance may change over time as suppliers and their creditors develop greater familiarity with and confidence in the scheme.

Questions to consider

- How will payments be tied to particular dimensions of performance, and will penalty and bonus payments be used to fine-tune incentives?
- Is it necessary to include payments not dependent on performance? If so, what share of the total payment will they be?
- Is it appropriate to share some risks with service providers, such as changes in the prices of essential inputs?
- Is it necessary to include up-front payments? If so, what share of the total payment will they be, and how will the risk of subsequent nonperformance be addressed?

Shaping other aspects of the contract

Clear definition of the services to be provided and the payment arrangements is clearly central to the service agreement. But a range of other issues require attention, including the legal nature of the contract, its duration, and the mechanisms it provides for adjusting its terms during its life and for resolving potential disputes.

Performance contracting between government entities often relies on "quasi-contracts" that are not legally binding.[10] In contrast, the enforceability of

contracts in output-based aid schemes is essential to eliciting a supply response, providing strong incentives for efficiency, and mobilizing private financing. Indeed, the existence of a binding contract may be the basis on which banks or other financial intermediaries extend credit to service providers, as is the case with similar agreements in private infrastructure projects.

The appropriate duration of the contract depends in large part on the investments the service provider needs to make to deliver the service. The term of the contract usually needs to be long enough to allow the investment costs to be amortized over its life. Argentina's road maintenance and rehabilitation concessions are for 5 years, Guinea's water lease was for 10 years, and Peru's rural telecommunications scheme involves (nonexclusive) licenses for 20 years. When the service provider will have access to user fees, it may be possible to limit the commitment for subsidy payments to a period shorter than the service agreement. Subsidy payments under Guinea's water lease were limited to the first six years, and in Peru's rural telecommunications scheme to the first five, after which time the service providers were expected to rely on user fees alone.

Longer-term contracts need to anticipate possible developments during the life of the arrangement. Because anticipating all contingencies is impossible, it is usually prudent to include mechanisms for adjusting contractual terms to unforeseen developments. Particularly when significant investments are required that depend heavily on access to subsidy payments, these mechanisms need to take into account the risk investors may face from opportunistic government action once the investment has been made.[11]

In most cases disputes over the interpretation or application of a service contract will be subject to the jurisdiction of the courts in the host country. But it is usually important to establish mechanisms for the amicable settlement of disputes and—particularly when foreign firms are required to make significant investments—to consider international commercial arbitration.

Questions to consider

- What measures need to be taken to ensure that the contract is legally enforceable?
- What is the optimal duration of the service contract? Does the commitment to provide public funding need to be of the same duration?
- With longer-term contracts, have measures been put in place to facilitate adjustments of the contract to unforeseen developments?
- Have adequate measures been put in place to deal with possible disputes?

Structuring the administration of the scheme

Output-based aid schemes need to be administered competently and at reasonable cost. This requires consideration of the scope of the scheme, the nature of the scheme administrator, and the assignment of responsibilities.

Defining the scope of the scheme

The scope of output-based aid schemes has three main dimensions:

- *Sectoral.* Should the scheme cover a single sector, such as rural electrification, or a broader range of related sectors, such as rural infrastructure services?
- *Geographic.* Should the scheme cover a single subnational jurisdiction, or the country as a whole?
- *Funding.* Should the scheme rely on funding from only one source, or allow the pooling of resources from several sources?

Schemes with a broad sectoral and geographic scope offer potential economies of scale that can reduce administrative costs. For example, the means testing of households in Chile is cost-effective only because the system is used to determine the eligibility for subsidies for a wide range of services. Broader approaches also allow the pooling of expertise, which may be scarce in some countries, and can be helpful in sharing lessons across a range of projects. Schemes that cover two or more similar sectors (such as rural water and electricity) may also allow the bundling of services, offering potential cost savings in service delivery (see Sommer 2001).

Schemes that are open to multiple funding sources can reduce administrative costs and help to ensure that funding is sustainable. They can also aid the coordination of donor activities, which can be important in ensuring that the disciplines of output-based aid approaches are not undermined. The feasibility of this approach depends on the extent to which potential sources of funding share common objectives.

Some pilot schemes might initially cover a relatively narrow set of sectors and geographic areas and rely on a single funding source. In these cases it may be possible to design the scheme in a way that facilitates broadening over time.

Questions to consider

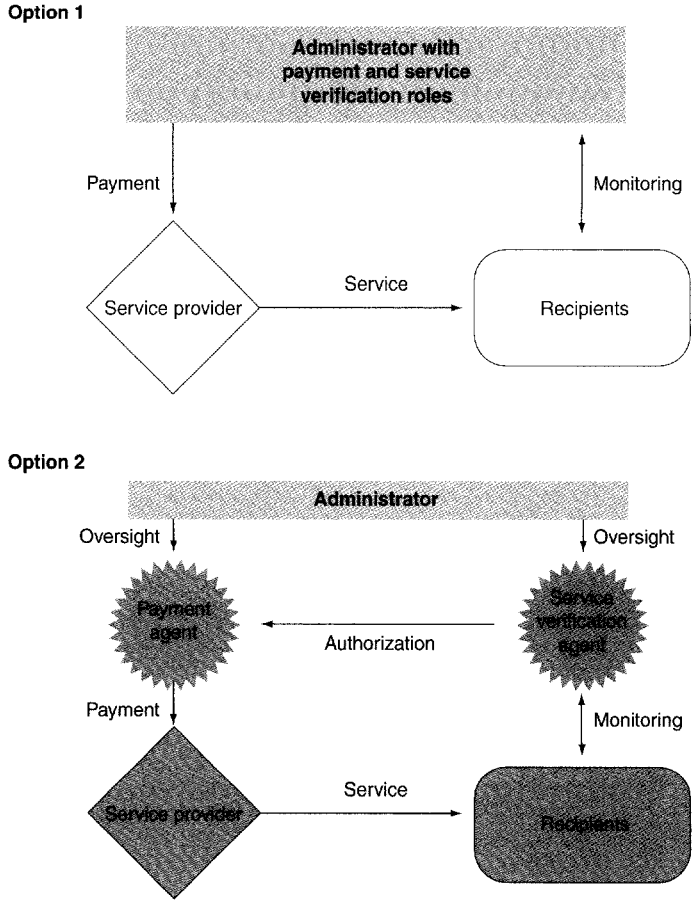
- Are the scheme's sectoral and geographic scope appropriate?
- Does the scheme allow the pooling of multiple funding sources?
- If a pilot scheme is established initially with a relatively narrow sectoral, geographic, or funding scope, does the scheme's design facilitate broadening over time?

Selecting the scheme administrator and assigning responsibilities

All schemes require an entity responsible for their overall management. This role might be performed by existing or new public agencies or contracted out to private firms or to nongovernmental organizations. The credibility and competence of the scheme administrator will be critical to winning the confidence of prospective service providers and thus helping to mobilize a supply response and private financing.

The administration of output-based aid schemes can involve a range of distinct activities—mobilizing resources, designing contracts, awarding con-

FIGURE 1 **Administrative structures—two options**



tracts (including conducting bidding), distributing vouchers or similar instruments, monitoring and verifying service delivery, and paying service providers. There may also be ancillary activities related to marketing the scheme to prospective suppliers and providing capacity building services. These roles might be performed by the scheme administrator or allocated among several entities (figure 1).

The critical responsibility for monitoring and verifying service delivery might be retained by the scheme administrator or contracted out to other entities. Potential candidates include existing regulatory bodies (as in Peru's rural telecommunications scheme), independent institutes (as in Haiti's health care scheme), private consulting firms, and local communities. The appropriate choice will depend on such factors as the expertise required, the need to ensure an arm's-length relationship with service providers, the need to ensure high standards of probity, the administrative costs (including potential economies in bundling responsibilities), and the benefits from involving communities in implementing the scheme.

Questions to consider

- Is there an existing public agency with the competence and credibility to administer the scheme? If not, will a new public entity be created, or will administration be contracted out?
- Will the scheme administrator undertake all responsibilities under the scheme, or will some of these be contracted out to other entities?

Leveraging experience

Output-based aid is a relatively novel approach to financing and delivering public services. But those designing and implementing output-based aid schemes can draw on a large body of relevant experience, particularly in private infrastructure arrangements. Moreover, many schemes are begun as pilots, to test and refine approaches. Building on the lessons from these pilots, output-based aid schemes usually expand progressively within countries, as with roads in Argentina, education in the United Kingdom, and health services in Haiti. There are also important opportunities to leverage lessons of experience across countries and sectors.

The potential for leveraging lessons across countries for a particular service is clear. The design of a scheme for supplying water or education services in one country can provide important insights for schemes covering the same services

BOX 8 **Measuring progress**

Output-based aid strategies can be implemented in a variety of ways. Progress in applying the key principles can be measured at the level of individual schemes against the following criteria:

- Targeting of development outcomes—reflected in the approach to designating eligible recipients and in the role of outcome-related performance measures.
- Accountability for results—reflected in the extent to which payment depends on achievement of the specified results.
- Incentives for efficiency—reflected in the form and extent of competition and of contract-based incentives.
- Opportunities for innovation—reflected in the balance between input-, output-, and outcome-related performance measures.
- Mobilization of private financing—reflected in the amount of private financing leveraged by the public resources.

Cost-effectiveness is also an important consideration. Pilot schemes usually have relatively high design and implementation costs, reflecting the additional costs associated with pioneering new approaches and the small number of service recipients over which costs are nominally allocated. Follow-on or expanded schemes usually improve cost-effectiveness because they can draw on the lessons of pilots and allocate costs over a larger pool of recipients. Assessments of cost-effectiveness also need to take account of benefits that can spill over to services outside the scope of the service agreement. International experience shows, for example, that contracting out service delivery usually inspires improved performance by public sector providers of the same or similar services (see Hodge 1999).

in other countries. Transferring lessons is particularly important for such matters as specifying performance standards, but can extend to many other aspects of design and administration. While care needs to be taken to avoid cookie-cutter approaches, efforts to distill and disseminate lessons of experience will reduce the costs of designing schemes and avoid needless repetition of mistakes.

There are also opportunities to leverage experience—and in some cases resources—across sectors. The unique characteristics of each public service cannot be ignored. But many common issues arise in designing output-based aid schemes, ranging from the design of contracts to the structure of administrative arrangements. Within a single country there may be advantages in drawing on common approaches to targeting intended recipients, engaging with communities, mobilizing local financing, and dealing with contract design issues—and even in using common entities for administering at least

parts of different schemes. Insights and lessons that transcend sectors can also be shared across countries. Taking full advantage of this opportunity may require a change in mind-set for professionals unaccustomed to looking beyond traditional sector boundaries.

Ultimately, output-based aid strategies and particular schemes will need to be evaluated by the same standard they seek to apply to providers of public services—on the basis of results (box 8).

Notes

Warrick Smith is manager of the World Bank's Private Provision of Public Services Group. This checklist benefited greatly from many conversations with Penelope J. Brook as well as comments on drafts from various members of the Private Provision of Public Services Group. All shortcomings remain the responsibility of the author.

1. For a useful review of design issues associated with infrastructure concessions see Kerf and others (1998).

2. There is often room for debate about what services have the characteristics of merit goods and the extent to which any social benefits exceed the benefits captured by individual users. In some cases underconsumption may result from inadequate understanding by users of the benefits they can derive from consumption, suggesting that public education could be an important part of the policy response.

3. While private financing typically has a higher nominal cost, public financing usually reflects implicit contingent claims against all taxpayers (see Klein 1997).

4. For a review of issues relating to voucher schemes for public services see OECD (1999b) and Steurele and others (2000).

5. Cross-subsidy approaches involve charging higher prices for some services or categories of users to allow lower prices to be charged for others. They require monopoly provision to prevent those paying the higher prices from defecting to other options. Because service providers have no natural incentive to provide the underpriced services (they lose money on each transaction), heavy-handed regulation is required to make the arrangement work; as a result, this approach is not feasible or effective in all environments. Indeed, cross-subsidy systems ostensibly designed to help the poor may act against their interests in many developing countries by both destroying incentives to offer them services and restricting their access to other service options.

6. Under monopolistic schemes, exclusive access to user fees from more affluent users in the service area may itself constitute a form of implicit subsidy. But schemes that do not involve an explicit payment are not considered to be output-based aid schemes here, even when retention of the monopoly or the level of permitted tariffs is conditional on meeting certain performance standards.

7. A variation on this approach is to specify the subsidy and to award franchises on the basis of the user fee component, other obligations assumed by the service provider under the scheme, or some combination of the two.

8. The Argentine case also reinforces the need for careful market testing of the scheme: an initial bidding round offering a smaller share of up-front payments had to be canceled when bids exceeded official estimates by nearly 100 percent because of high financing costs.

9. In Peru firms awarded licenses for rural telecommunications services were required to provide three financial guarantees: a guarantee ensuring the seriousness of their offer, an installation guarantee, and a guarantee against default on their contractual obligations (see chapter 1).

10. For a review of issues associated with performance contracting between government entities see OECD (1999a).

11. For a review of how private infrastructure schemes address issues of political and regulatory risk relevant to output-based aid schemes see Smith (1998).

References

Harper, Malcolm, Jorge Arroyo, Tushar Bhattacharya, and Tom Bulman. 2000. *Public Services through Private Enterprise: Micro-Privatisation for Improved Delivery.* London: Intermediate Technology Publications.

Hodge, Graeme. 1999. *Privatization: An International Review of Performance.* Boulder, Colo.: Westview Press.

Kerf, Michel, R. David Gray, Timothy Irwin, Celine Levesque, and Robert R. Taylor. 1998. *Concessions for Infrastructure: A Guide to Their Design and Award.* World Bank Technical Paper 399. Washington, D.C.

Klein, Michael. 1997. "The Risk Premium for Evaluating Public Projects." *Oxford Review of Economic Policy* 13(4): 29–42.

OECD (Organisation for Economic Co-operation and Development). 1999a. *Performance Contracting: Lessons from Performance Contracting Case Studies and a Framework for Public Sector Performance Contracting.* PUMA/PAC (99)2. OECD Programme on Public Management and Governance (PUMA). Paris.

———. 1999b. *Voucher Programs and Their Role in Distributing Public Services.* Paris.

Smith, Warrick. 1998. "Covering Political and Regulatory Risk in Private Infrastructure." In Timothy Irwin, Michael Klein, Guillermo Perry, and Mateen Thobani, eds., *Dealing with Public Risk in Private Infrastructure*. Washington, D.C.: World Bank.

Sommer, Dirk. 2001. "Multi-Utilities: Policy." Viewpoint 228. World Bank, Private Sector and Infrastructure Network, Washington, D.C.

Steurele, C. Eugene, Van Doorn Ooms, George Peterson, and Robert D. Reischauer, eds. 2000. *Vouchers and the Provision of Public Services*. Washington, D.C.: Brookings Institution Press.

U.K. National Audit Office. 2001. *Measuring the Performance of Government Departments*. London.

World Bank. 1994. *World Development Report 1994: Infrastructure for Development*. New York: Oxford University Press.

Suggested readings

Baker, Bill, and Sophie Tremolet. 2000. "Utility Reform: Regulating Quality Standards to Improve Access for the Poor." Viewpoint 219. World Bank, Private Sector and Infrastructure Network, Washington, D.C.
Determining the quality standards that should apply to service delivery is a critical element in identifying parameters and indicators of performance for output-based schemes. This paper, focusing on infrastructure, notes the importance of thinking carefully about the implications of quality standards for costs, particularly where the objective is to expand services for the poor.

Domberger, Simon. 1998. *The Contracting Organization: A Strategic Guide to Outsourcing.* New York: Oxford University Press.
This seminal book on contracting for services explains when it makes sense to contract out and what the key determinants of success are. Chapter 9 focuses on the issues that arise in public sector contracting, reviewing the prospects and limitations of contracting out service delivery and noting critical design challenges.

Foster, Vivien. 2000. "Measuring the Impact of Energy Reform: Practical Options." Viewpoint 210. World Bank, Private Sector and Infrastructure Network, Washington, D.C.
To be effective, output-based elements of sectoral reform require good indicators of impact. Few reforms in infrastructure have included systematic efforts to assess the impact of reform on access to services for the poor. This paper suggests approaches to identifying meaningful, measurable indicators of the impact of energy reforms.

Glennerster, Rachel, and Michael Kremer. 2000. "A Better Way to Spur Medical Research and Development." *Regulation* 23(2): 34–39.
This article looks at the possibilities for spurring research on effective vaccines against communicable diseases—such as HIV, malaria, and tuberculosis—by

complementing traditional funding approaches (direct funding and patent revenues) with purchase precommitments for future vaccines.

Harper, Malcolm, Jorge Arroyo, Tushar Bhattacharya, and Tom Bulman. 2000. *Public Services through Private Enterprise: Micro-Privatisation for Improved Delivery.* London: Intermediate Technology Publications.
This book looks at the potential and options in developing countries for contracting out the provision of infrastructure and social services to small-scale private and community enterprises. It includes 24 case studies from Asia, Africa, Europe, Latin America, and the United States.

Hodge, Graeme. 1999. *Privatization: An International Review of Performance.* Boulder, Colo.: Westview Press.
Chapters 6 and 7 of this book review privatization reforms, focusing on the challenges of performance-based contracts with private entities. The chapters identify indicators against which the impact of these contracts might be measured and analyze the identifiable impacts of the contracting out that has been done.

Hoxby, Caroline. [http://post.economics.harvard.edu/faculty/hoxby/papers.html].
The Web site of Caroline Hoxby, an associate professor of economics at Harvard University, provides a series of papers on the use of vouchers for education services and their impact on school performance.

Illinois Department of Children and Family Services. 2000. *Performance Contracting in Illinois' Child Welfare System.* Chicago.
In 1997 the state of Illinois introduced performance contracting to increase the success with which children in foster care were placed in permanent homes. The program has transformed the state's child welfare system from one of the poorest performing in the United States to a national leader in permanent placements.

Jadresic, Alejandro. 2000. "Promoting Private Investment in Rural Electrification." Viewpoint 214. World Bank, Private Sector and Infrastructure Network, Washington, D.C.
One of the earliest and most thorough energy reformers, Chile has also been one of the more innovative in restructuring its subsidy schemes. Its rural electrification program includes subsidies designed to be consistent with the

broad principles of energy reform—decentralizing decisions to the regional and community level, introducing competition (between technologies as well as suppliers), and requiring that all partners in the process (users and private companies as well as the state) contribute to the financing of expansion projects.

Klein, Michael. 1998. "Bidding for Concessions: The Impact of Contract Design." Viewpoint 158. World Bank, Finance, Private Sector, and Infrastructure Network, Washington, D.C.
Infrastructure concession contracts set out the performance obligations and rights of concessionaires and the incentives and risks under which they operate, including pricing arrangements. This paper examines the design of infrastructure concession contracts in relation to bidding processes.

Klein, Michael. 1998. "Rebidding for Concessions." Viewpoint 161. World Bank, Finance, Private Sector, and Infrastructure Network, Washington, D.C.
This paper looks at the issues that come into play in a decision about whether to rebid a concession—issues relating to the incentives for investment and maintenance that the incumbent faces. The paper also examines the case for rebidding.

Levesque, Celine, Michel Kerf, David Gary, Timothy Irwin, and Robert Taylor. 1998. *Concessions for Infrastructure: A Guide to Their Design and Award.* World Bank Technical Paper 399. Washington, D.C.
Concessions give private companies the right to provide a particular infrastructure service. This book-length paper sheds light on the most important and difficult issues involved in designing, awarding, implementing, and monitoring concessions in the infrastructure sector.

OECD (Organisation for Economic Co-operation and Development). 1999. *Performance Contracting: Lessons from Performance Contracting Case Studies and a Framework for Public Sector Performance Contracting.* PUMA/PAC (99)2. OECD Programme on Public Management and Governance (PUMA). Paris.
This two-part report on public sector performance contracting combines case studies from nine OECD countries (Australia, Belgium, Canada, Denmark, Finland, France, New Zealand, Norway, and Spain) with an analytical framework for determining the relevance and design of performance contracts in different contexts.

Scott, Graham. 2001. *Public Management in New Zealand: Lessons and Challenges.* Wellington: New Zealand Business Roundtable.
New Zealand undertook a series of significant public sector reforms starting in 1987. This book surveys these reforms and their impact. Chapter 7 focuses on the issues in setting and monitoring performance specifications for core public services.

Vinson, Elisa. 1999. "Performance Contracting in Six State Human Services Agencies." Urban Institute, Washington, D.C.
This paper looks at the activities of state agencies in Florida, Illinois, Maine, Minnesota, North Carolina, and Oklahoma that have used performance contracting to improve adoption, job placement, and related services and reviews early evidence on the impact of alternative contracting arrangements.

Wellenius, Björn. 1997. "Extending Telecommunications Service to Rural Areas: The Chilean Experience—Awarding Subsidies through Competitive Bidding." Viewpoint 105. World Bank, Private Sector and Infrastructure Network, Washington, D.C.
After Chile privatized its telecommunications industry in the late 1980s, service provision expanded rapidly—but around 10 percent of Chileans still lived in rural localities without even a public telephone. This paper describes the least-subsidy bidding scheme used to mobilize the private sector to extend public telephone service to these areas.

Private Sector Advisory Services
The World Bank
1818 H Street NW
Washington, DC 20433, USA

Telephone: 202 473 3256 or 202 458 1111

Web site: rru.worldbank.org

Email: psasquery@worldbank.org
or rru@worldbank.org

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