

IMPACT OF MARKET STRUCTURE ON SERVICE OPTIONS FOR THE POOR

David Ehrhardt
Consultant
davide@cwjamaica.com

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1. PRO-POOR STRUCTURAL CHECKLIST FOR PPI

In this section we summarise the key pro-poor structural issues Governments should consider when planning to introduce private participation in network utility industries. The analysis is developed in subsequent sections of this paper. Decisions made in these areas will determine to a large extent the impact of private participation on poor communities.

It is important that reforms aimed at assisting the poor be considered explicitly before any major reform is done. This should begin with the collection of data to assess the specific conditions that affect the poor and their specific needs and preferences, rather than relying on generalisations.

Pro-poor issues should be considered as part of an integrated approach to structural reform. This will ensure that pro-poor structural reforms are compatible with the overall approach. For example, it should result in regulation that focuses on network access and is not too onerous for informal vendors and a subsidy regime that is robust to the degree of entry and competition being envisioned.

The most important factor in ensuring that poor communities receive service is establishing a competitive, efficient and well capitalised industry. This will benefit all consumers to the extent that utilities are able to provide good service at least cost and are able to fund capital expenditures to meet demand. It is also more likely to benefit the poor since inefficient undercapitalised utilities are unlikely to be able or willing to take risks or expend capital in meeting the needs of the poor.

In Section 3, we discuss some of the issues to be considered in utility market structure to ensure that all customers benefit from private participation. We recommend that, in general, the following reforms should be considered:

- horizontal unbundling, which introduces competition in each sector of the industry;
- vertical unbundling, which separates ownership or operation of the different sectors of the utility from one another;
- private participation, which may range from BOOTs to privatisation; and
- free entry, which would permit entry into an industry.

The manner in which utilities are reformed along the lines described above will impact on subsidy design and regulation as discussed in sections 5 and 6. Administrative capability is also important in determining the types of reforms implemented.

In section 4 we recommend various pro-poor structural reforms that should be considered explicitly as a part of the overall reform process. In addition to the reforms aimed at improving service and efficiency for all customers, we conclude that the most important reforms specifically targeted to the poor are those which would allow small scale and informal vendors to provide service, even if they are directly competing with the dominant provider.

To facilitate this the major reforms necessary are:

- allowing entry by removing exclusivity laws and licensing requirements;

- allowing vendors to access bulk supplies of water and electricity from existing suppliers at fair prices; and
- allowing interconnection with existing telecommunications networks.

When implementing these reforms, subsidy design should also be taken into account. Pro-poor subsidy design may be enhanced by the following considerations:

- General income subsidies, financed by taxation, are likely to be the most efficient and have the least impact on market structure.
- If the Government is fiscally constrained, then a Universal Service Fund should be considered. This may be difficult to administer.
- If a subsidy is required but there is limited administrative capacity, then a cross-subsidy, with restrictions on free-entry and unbundling may be necessary. This should be assessed on a case by case basis to determine whether competition or cross-subsidies are likely to be more pro-poor. An important factor in this decision is whether the monopoly provider is providing some service already to the poor or can be compelled to do so. If this is not the case, then the poor would not benefit from the cross-subsidy and are likely to be better off with new innovative entrants to the market.
- The administration of a subsidy through several vendors may be complex and may prevent the Government from subsidizing the customers of new entrants. However, free entry and unbundling should not be restricted because of this concern. If an entrant is able to serve the poor without a subsidy, then this should be welcomed.

Regulation will be impacted by the recommended pro-poor reforms. As the structure of the industry changes with pro-poor competition being introduced into various unbundled sections of the utilities, appropriate regulatory responses are likely to include:

- reducing the scope of regulation, so that competitive areas are no longer regulated;
- changing the focus of regulation to regulating the price at which bulk service or network access is provided to competing providers; and
- adding an anti-trust or competition law element to regulation, to prevent providers which have a dominant position in a market from using that position to prevent competition in that or related markets.

At the same time, small entrants should not be regulated even if they have a local monopoly.

2. PROBLEMS IN SERVICE DELIVERY TO THE POOR

On average, in 1996, only about 48% of households in sub-Saharan Africa had access to electricity, ranging from 1% in Burundi to 96% in Senegal. Only about 42% of sub-Saharan Africa had access to safe water. In East Asia and the Pacific, the figure for access to safe

water was 68% and in Latin America about 76% had access.¹ The persons left without access to services in these regions were undoubtedly the poorest.

Generally, rural communities have less access to utility services than urban residents. A survey of electricity coverage in developing countries found that, outside of Africa, while urban coverage exceeded 85%, rural electrification varied widely among the countries surveyed.² In Kenya, for example, less than 2% of the 3.7 million rural households have access to grid electricity. Even if the annual connection rate was 10,000 connections per year, it would take almost 400 years to connect the existing rural population.³ These conditions tend to apply in other utility industries.

In both rural and urban areas, lack of access is usually a function of local geography. Areas where poor people live often do not have utility services, since these services are provided over networks, which do not extend to those areas. There are several reasons why utility services may not be provided to places where poor people live. Some of these are discussed below.

Service providers may simply find it uneconomic to supply poor areas. This may be because of concerns about revenue collection or additional costs. The result is that the infrastructure is not put in place to provide the service. This problem may be compounded if the utility is a state-run monopoly provider. Such utilities have tended to be inefficient and unprofitable. Consequently, the utility may be unable or unwilling to make the necessary capital expenditures to provide service to the poor. In some countries, the percentage of poor people with access to services is actually falling, as state-run utilities are unable to keep up with expanding demand.

Many poor urban areas have been virtually abandoned by the traditional sectors of society. Some areas have levels of violence, which make the staff of the service provider reluctant to enter the area. In some areas of downtown Kingston in Jamaica, for example, technicians of the water and electricity utilities have been physically attacked and shot at. Such concerns may prevent utilities from investing at all in these areas or from maintaining existing networks.

Poor communities often grow up on marginal lands, such as steep hillsides or riverbanks. Such terrain is more difficult to service. The engineering issues in delivering the service may be costly to resolve. In other cases, poor communities may develop in urban peripheries. Costly new trunk mains or transmission lines may need to be extended to the edge of the metropolis, and new distribution systems installed. Utilities may not make the investment, having little hope of recovering the cost through additional tariffs.

¹ Kerf, Michael and Smith, Warrick, 1996, *Privatising Africa's Infrastructure*, African Region Series, World Bank Technical Paper no. 337, World Bank, Washington, D.C.

² Komives, Kristin, Wittingham, Dale, and Wu, Xun, 2000, *Energy Services for the World's Poor*, Annex: Energy Use Around the World – Evidence from Household Survey, Energy and Development Report, World Bank, Washington D.C.

³ Hankins, Mark, 2000, *Energy Services for the World's Poor*, chapter 11, Energy and Development Report, World Bank, Washington D.C.

Rural areas may be more difficult to serve for several reasons including that rural communities are more sparsely populated and also tend to have a greater proportion of poor to rich consumers than urban communities.

Squatting is common in poor urban and rural areas. Often, inhabitants do not have formal title to the land occupied. Where land tenure is formalised, poor people will often be tenants, not owners. Lack of freehold title can present various problems for service providers. Utilities may be legally required to contract with the actual owner of the property, or may require that customers have title to the property being served as security against non-payment.

In many slums and rural communities, liability for utility bills may also be uncertain. Poor communities often have more than one family living in a single house. This can pose a problem in billing and collection.

Finally, the mind-set of traditional utilities is sometimes a cause of poor service to poor communities. Most large utilities tend to value structure and order, and are unable to deal effectively with the sometimes disordered environment in poor communities. The special characteristics of poor communities often require alternative approaches which utility companies may not be comfortable with. The problems in the traditional utility approach are explored in more detail in the next section.

3. STRUCTURAL OPTIONS

In response to disappointing service and financial performance by conventional state-owned monopolies, many Governments have undertaken serious reforms. These reforms typically change the structure and ownership of the industry, introducing competition and private capital. In this section we outline structural options available to Governments as they reform their utility sectors. We examine the options in the following groups:

- un-bundling an integrated monopoly provider;
- changes in ownership structure; and
- allowing entry by new providers in some market segments.

The possibilities for new and innovative structures are myriad, and our aim is not to document them all. Rather, it is to provide a framework or typology within which the main options can be identified, and their relationship with each other seen.

3.1 Un-bundling an integrated monopoly provider

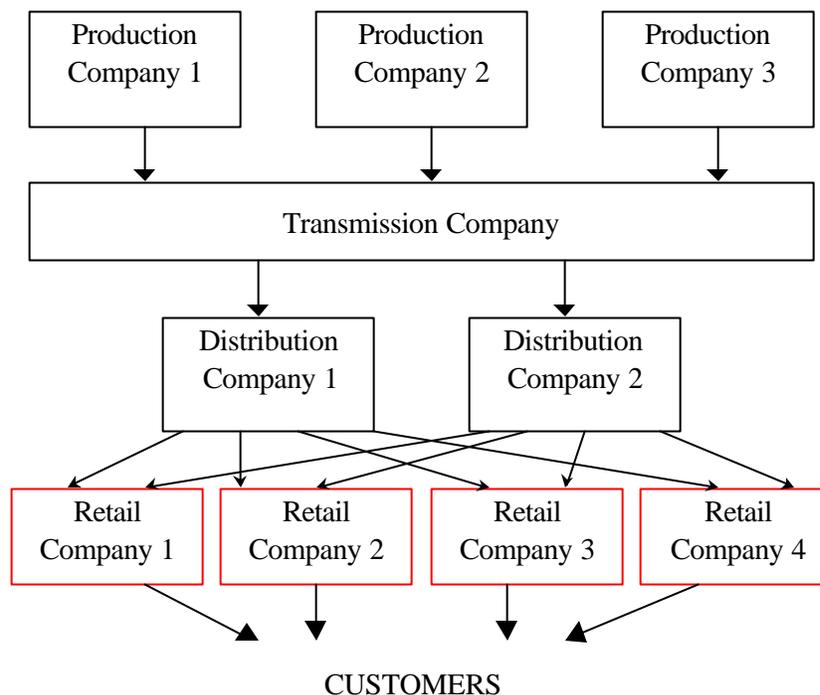
Until the 1980s the accepted structure for a utility provider was a vertically integrated geographic monopoly. In developed countries this started to change in the 1980s.

One of the first high-profile cases was the break-up of AT&T in 1984. The trend spread to the energy industry, notably with unbundling in the United Kingdom in 1989, and later to the water industry as well.

During the 1990s, developing countries started to pursue similar strategies. Across Latin America, in particular, restructuring and privatisation of utility companies accelerated. Competition was also introduced into many of the unbundled industries. For example, in Argentina, the three major vertically integrated companies were broken up and privatised in 1992. This has resulted in 25 generation companies, 22 distribution companies and 1 transmission company. These reforms have often been successful in increasing the efficiency of utilities and making them more responsive to customers.

There are a range of possible options in unbundling utility industries. It is worth providing a conceptual framework to describe the various alternatives. A typography of the options available is shown in Figure 3-1. It illustrates full unbundling of a utility such as water, electricity or gas. The production, transmission, distribution and retail supply of the service are separately operated by different companies.

Figure 3-1: Unbundled industry



Production refers to the abstraction and treatment of water or gas, or the generation of electricity. Transmission includes main trunk lines through which water, gas or electricity are fed from production plant to the distribution network, which carries the service to individual homes. Retailers contract with distributors and customers to sell the service from the distributor's network to the consumer.

In this figure, competition is present in all markets, except for transmission and distribution, where competition is seldom feasible. The two companies shown in distribution are regional monopolies.

Unbundling in telecommunications or transport looks a bit different. This is because the network is not configured to deliver a product to consumers, but rather to connect together customers who wish to communicate with each other.

In telecommunications unbundling has typically involved separation of local telephony, international telephony, wireless telephony, and value-added services. In transport, the equivalent could be para-transit operators providing feeder services to trunk routes operated by larger buses, as well as allowing competition on some or all routes.

3.2 Changes in ownership structure for existing providers

The wave of utility reforms of the 1980s and 1990s included not only unbundling and competition, but also increased involvement of the private sector in the ownership and management of utility companies.

In some developed countries, private participation in infrastructure has long been the norm. In the USA, for example, telecommunications and electricity companies have always been privately owned, as has a significant proportion of the water industry. Similarly in France, about a third of the water systems are privately managed, reflecting a long-standing tradition of concessioning infrastructure provision to private enterprise.

Nevertheless, in many developed countries and most developing countries, infrastructure provision has been the preserve of the public sector, at least from the 1950s to the mid-1980s. This often led to problems, including low levels of efficiency and lack of capital with which to expand services as demand grew.

Private participation has generally been successful in reducing costs and increasing investment in utilities. More and more developed and developing countries have since followed this route. For example:

- in Buenos Aires, Argentina, a concession was awarded to a private consortium for the water and sanitation operating company in 1993;
- in 1996, the sale of generating companies in the electricity sector began in Brazil, with the sale of distribution companies following in the subsequent year; and
- in the Czech Republic, shares in municipal water and sanitation operating companies were sold as part of the voucher privatisation process.

During the 1990's this trend accelerated. In 1990, US\$15.6 billion was invested in privately financed infrastructure projects in developing countries. By 1998, this figure had increased to US\$95.3 billion. From 1990 to 1998, the total value of such investments totalled

US\$496.2 billion. The telecommunications and energy sectors had the largest amount of such investments.⁴

Diverse experiences, ranging from the Anglo-Saxon approach of private ownership of assets to the French model of concessioning or contracting out of infrastructure management, has led to the evolution of a diversity of possible structures involving the private sector. Table 3-1 summarises the main models for private sector participation.

Basically, there is a continuum of options from contracting out discrete services, through 3 year management contracts to privatisation through asset sales. Typically, the longer the contract, the more responsibility for investment the private sector takes, and the more risk. On the other hand, shorter contracts mean more frequent competition for the market, and more flexibility.

Table 3-1: Options for Private Participation

Option	Operation	Management of system	Maintenance ¹			Investment		Ownership of assets
			a	b	c	Planning	Financing	
Service Contract	✓	×	×	×	×	×	×	Public sector
Management contract	✓	✓	✓		×	×	×	
Lease	✓	✓	✓	✓	✓	✓	×	Public sector
Concession	✓	✓	✓	✓	✓	✓	✓	Public sector ²
Asset sale	✓	✓	✓	✓	✓	✓	✓	Company
BOOT (new assets)	✓	×		✓	✓	✓	✓	Company/ Public sector

⁴ Roger, Neil, 1999, Recent Trends in Private Participation in Infrastructure, Viewpoint 196, World Bank, Washington, D.C.

Notes:

- ¹ Three different functions exist: planning (a), carrying out the work (b), and financing the maintenance (c).
- ² The assets are transferred to the concessionaire for a fixed period of time but are owned by the State.
- ³ Allocation of this responsibility varies according to the contract
- Key: ✓= responsibility lies with the private operator
 ×= responsibility lies with the public sector

3.3 Allowing entry by new providers in some market segments

Often reforms have focused on restructuring an existing utility. But changes in industry structure and ownership can also result from the entry of new providers into the business. These new providers may compete with the incumbent, or may serve market niches, which were previously unserved.

New entrants can be a powerful force for change, in their own right and as a catalyst for further structural change in the industry. US telecommunications restructuring and liberalisation, for example, was catalysed by MCI's entry into the market. The extent to which entry is encouraged is therefore another important policy tool.

If competitors are able to enter into the incumbent's market, this will tend to drive prices down in line with costs. Even if competition is limited, the threat of increasing entry will encourage incumbents to lower prices. This may also lead to further unbundling in the future. Box 3-1 describes an example of this process.

Box 3-1: Unbundling Cable and Wireless in Jamaica

In Jamaica, the entrance into the telecommunications market of V-sat licensees and call-back services began to chip away at Cable and Wireless' monopoly in long-distance telephony. These new entrants were encouraged by the existence of cross-subsidies for local telephony from long-distance callers, which raised the price of long-distance services and created price distortions.

Partly in response to this competitive threat, Cable and Wireless has recently agreed to give up its exclusivity in many areas. The consequence of this will be unbundling of the industry, as competitors emerge in cellular, value-added services, and broadband and data transmission.

In the telecommunications sector, in particular, competition in cellular telephony is increasingly being permitted in developing countries. Where competition exists, access has increased and prices have also tended to fall, improving services to all customers, including

the poor.⁵ Poor customers are likely to benefit to a greater extent from these changes in the market, since they are the hardest hit by the inefficiencies of monopoly providers.

New entrants may also improve service simply by providing service where it is not currently offered. This is more likely to be the case in poor communities. In villages in Bangladesh, for example, women entrepreneurs provide pay phone service at a profit using mobile cellular phones.⁶ Poorer customers all across the developing world rely on informal entrepreneurs to provide utility services when the traditional utility fails to deliver.

We will argue that facilitating new entry is one of the most important ways in which structural reform can improve service to poor people. To date this area has not been given enough attention.

4. STRUCTURAL REFORMS TARGETED TO THE POOR

Physical conditions, economic capabilities, social patterns, land tenure arrangements, etc, mean that providing appropriate service to the poor will often require non-standard service delivery mechanisms, service types and tariff and payment mechanisms. But utilities tend to have a one-size fits all approach to service and charging. Private sector participation can help, but in itself may not be sufficient. The tendency to ignore poor and marginal areas may continue. Few of the utility managers will have much contact with the poor areas, or much real understanding of the needs of potential customers there.

Thus, even if an existing utility is disaggregated and privatised as discussed in section 3, we would expect problems of lack of access, inappropriate service types, and to some extent inappropriate pricing to poor people to continue. Therefore it is imperative to make it easier for other providers to serve non-mainstream markets, such as poor areas.

In this section we examine specific structural reforms targeted to the poor. We discuss structural changes that could facilitate innovation in service provision. Examples of these innovations illustrate that in many cases they are a proven success.

The essence of our argument is that flexible and innovative approaches are needed if service is to be improved. While, as we point out in later discussions, some traditional utilities make an effort to develop approaches specifically designed to provide the poor with services, many mainstream utilities often are neither flexible nor innovative. Therefore it will often be beneficial to allow new entrants, who will tend to offer alternative solutions.

To make the case for structural reform, it is important to illustrate the type of innovations new entrants could offer and address the poor reputation which small and informal providers have in many areas. In the following sections we argue that:

⁵ Rossotto, Carlo Maria, Kerf, Michel and Rohlfs, 1999, Jeffrey, Competition in Mobile Telecoms, Viewpoint 184, World Bank, Washington, D.C.

⁶ Wellenius, Bjorn, 2000, Extending Telecommunications Beyond the Market, Viewpoint 206, World Bank, Washington, D.C.

- in some cases, small operators may be able to provide a ‘basic needs’ level of service more cheaply than formal network operators;
- small operators and new entrants may offer cost-quality combinations better suited to poor people’s willingness to pay; and
- new entrants can offer innovative tariff and payment systems which make it easier for poor people to access service.

In general, we would expect that facilitating entry by small and innovative operators will increase choice for poor people.

4.1 Basic needs provision – entrants vs. formal providers

It is well established that poor people often receive service from informal service providers, rather than formal utilities. For example, poor communities may be served by informal para-transit systems such as mini-buses or route-taxis, rather than formal scheduled bus or metro services. Similarly, poor households often take water from water carriers or vendors, not a piped utility system.

In many cases the informal providers’ service is lower quality than the formal network service. It can also have higher unit costs. For example in Guasmo Norte, a squatter community in Guayaquil, Ecuador, residents were paying about US\$9.50 per month for an average of 25 tanks of often contaminated water. This was more expensive than the clean piped water being received by wealthier residents of the city.⁷ Similar examples exist in most developing countries for a variety of services.

People often use inferior services because the formal network does not extend to their communities. There is a widespread assumption that a formal, high quality network service would always be preferred, where it is available. This assumption should be questioned. The high fixed costs of formal network services mean that alternative approaches will in some cases offer poor people better value for money. The limited quantity demanded by poor customers may mean that the overall cost of an informal supplier is less than the cost of a formal supply.

The apparent paradox of higher unit prices but lower monthly bills follows from the cost structure of service providers. Network utilities provide a service which requires heavy capital expenditures in the distribution network. This means that fixed costs are high. The infrastructure does not require large subsequent expenditures per unit in order for the service to be delivered.

On the other hand, an informal vendor may provide service by trucking water door to door, reselling mobile phone use, or recharging 12 volt batteries. These approaches do not entail large up-front expenditures, but are more costly per unit delivered. So while for most people it will be cheaper to purchase a network service, poor people who consume only small quantities may find it cheaper to use alternate methods.

⁷ p.39, Salmen, Lawrence E., 1987, Listen to the People, Oxford

In Table 4-1, we provide a stylised example of the cost structures of two different approaches to service provision. We can think about these as the options for providing service to an area in which no fixed network yet exists. It could represent telephone service in a Latin American favela, energy supply to an African village or provision of water to an Indian slum.

Table 4-1: Costs for different types of service

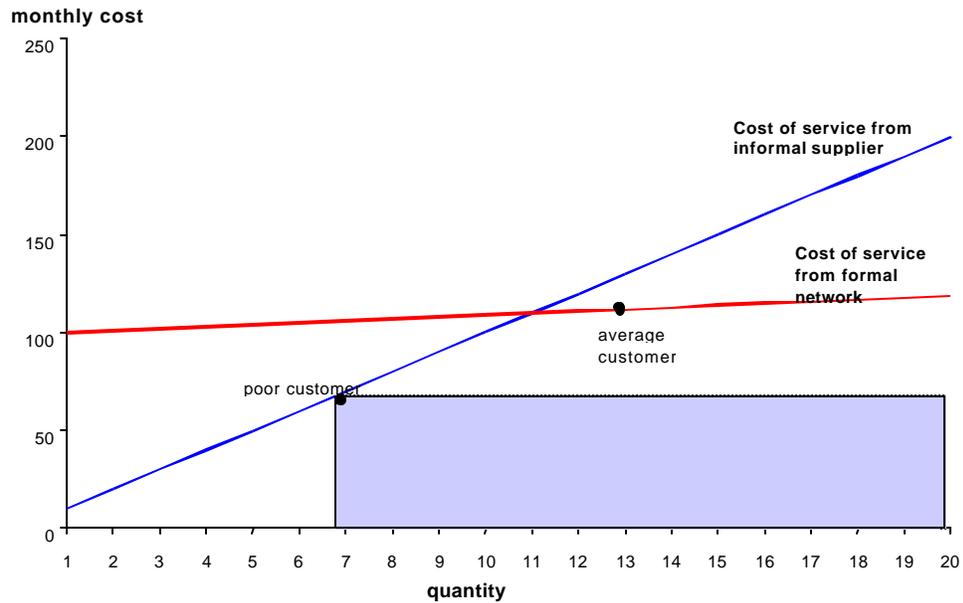
	Fixed cost	Variable cost (per unit)	Total cost for 5 units	Total cost for 15 units
Formal network	100	1	105	115
Informal supplier	0	10	50	150

Table 4-1 assumes that service to the area can be provided either through a formal utility network or by informal suppliers. It shows the fixed and variable costs for each type of provider. Fixed costs for the formal network primarily represents the cost of installing the network. Variable costs are those that occur each time a unit of the service is produced or delivered. These could include fuel cost for electricity generation, or pumping and treatment costs for water supply.

Based on the figures in Figure 4-1 at 11 units, the costs are identical. However, if a consumer uses more than 11 units, service from the formal network is less expensive. Conversely, if a consumer uses less than 11 units, the service from the informal supplier is less expensive.

Figure 4-1 is a graphical representation of Table 4-1. In Figure 4-1 a consumer may choose to consume any price/quantity bundle along either the informal supplier or the formal network supply curve. If a customer cannot afford the formal network's minimum bill of around \$100, then the only option is the informal supplier. In this example, a poor customer is shown to be consuming on the informal supplier's curve. The preferred area for such a consumer is clearly area P shown shaded on the graph, since his desired maximum expenditure is limited to the bill he is already paying and since he would prefer to consume at a lower price and at a higher quantity.

Figure 4-1: Price/Quantity Options



The challenge is for service options to be provided at an intermediate level of price and quantity with flexible payment options, within the poor consumer’s preferred space.

This would be possible if the advantages of a formal provider, including lower cost of capital and better management, could be combined with the entrepreneurship and responsiveness to actual demand of the informal system. A novel approach can be found in Bolivia where the water service provider, Aguas del Illimani offers households the option of paying a reduced connection fee in exchange for supplying labour during the connection process. The provider also offers financing for the connection fees.⁸ Using the framework in Table 4-1 and Figure 4-1, this would be a shift down in the fixed cost of supply from the utility. It results in a lower bill for any given quantity.

More generally, improved access to finance can help to overcome the problems imposed by high connection costs. This issue is discussed later in this section, which also outlines how structural changes can be instrumental in increasing flexibility and the range of options available.

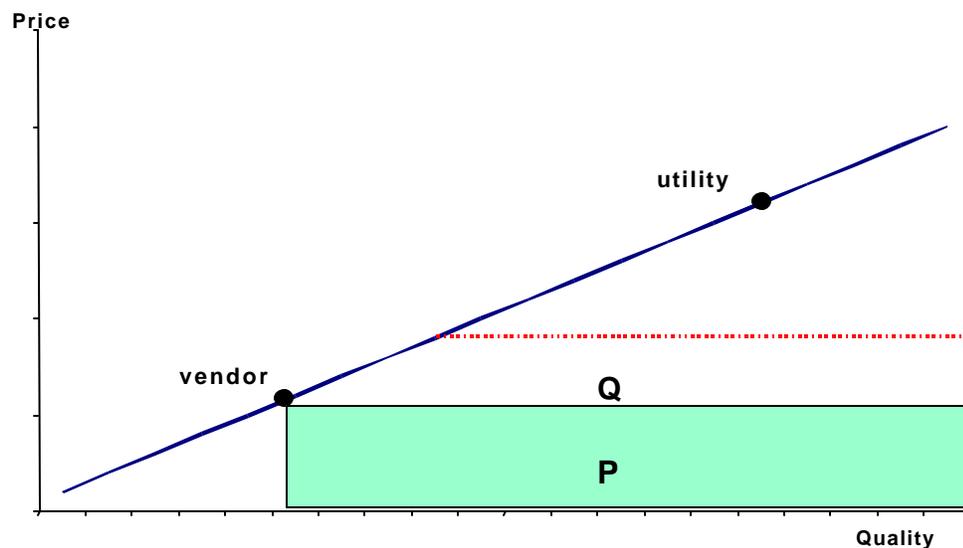
⁸ Komives, Kristin, November 1999, Designing Pro-Poor Water and Sewer Concessions – Early Lessons from Bolivia, World Bank, Private Sector Development Department, Washington, D.C.

4.2 Price and Quality Options

The discussion above can be expanded to take into account the quality dimension. Formal utility service is generally of a high quality. Poor consumers may be purchasing services from informal suppliers at a lower quality than they would like and at a lower price than they are willing to pay. For example, in the water sector, water provided by vendors may be contaminated with harmful bacteria. It is quite likely that these customers would be willing to pay more for a level of service, which is at least safe.

If there is no service being offered in the area, the choice faced by poor customers is especially stark. The dominant utility may need to invest heavily to provide high quality service but an informal provider is likely to have lower costs to provide a lower quality service.

Figure 4-2: Price/Quality Options



These options are illustrated in Figure 4-2. Two possible price/quality bundles are available to all customers. One is provided by the utility and the other by an informal supplier. Poor customers may be forced to choose the option provided by the vendor, because they cannot afford the option provided by the utility. The preferred space of a customer buying from the vendor is clearly in area P shown on the graph. However, as discussed above, poor customers may be willing to pay a higher price for a higher quality, though not at the level provided by the utility. This may be captured in area Q shown on the graph.

The challenge is to provide a more appropriate position on the price/quality spectrum to the poor. The poor would almost certainly want to be provided with certain aspects of quality, such as stable electrical current or water of a sufficient bacteriological quality. However, there is likely to be a price/quality trade-off on other aspects, such as water pressure, hours of electricity supplied and indoor plumbing.

Changes to traditional structures can help open up the possibility of services whose price and quality are better matched to poor people's needs and ability to pay. Allowing alternative suppliers will open up new delivery mechanisms. Providing ways for informal suppliers to interconnect with aspects of the formal service can allow improved service quality and access to finance. For example:

- Teshie, a low income unplanned community in Ghana, grew beyond the dominant water provider's capacity to serve. The network of the utility, the Ghana Water Company, extended to roughly half of the area. The remaining area received no service at all. Entrepreneurs began to serve this latter area using tankers. An association of water tankers was formed, which purchased bulk water from the Ghana Water Company and resold the water to individual tankers. Consequently, customers without a piped connection were now provided with water, which was of a high chemical and bacteriological quality.⁹
- In Guatemala City, a community group, ACOVA (Asociacion Comunitaria de Vecinos en Accion) operates the water supply system for the area. Water sources are comprised of two systems, one older, handed over to ACOVA by the municipality and a newer system constructed by the association. Customers are charged a flat rate of US\$1.50 if they are connected to the old system, which provides water twice per week for two hours. Those connected to the new system, which provides water daily for about two hours each day, pay a variable rate of US\$0.30/m³ for the first 30 meters and US\$0.55 for every m³ after that.¹⁰ Customers may choose to connect to either system. This allows customers with different incomes the ability to choose the quality of service appropriate to their needs.
- The Dar es Salaam City Commission, which is responsible for the provision of sewerage services to the city, operates a sewerage system serving about 20% of the sanitation demands of the city. It also operates a fleet of 4 pit emptying trucks serving the remainder of the city, which relies on septic tanks and pit latrines. This was insufficient to serve the entire area, resulting in waiting lists for the service. Private operators (initially illegal) began supplying cesspool emptying services by truck. Though this is of a lower quality than piped sewerage service, previously unserved customers received a more hygienic option from the informal operators, which was more responsive and cheaper.

4.3 Innovations in payment mechanisms

New entrants may also offer tariff and payment mechanisms more suited to the needs of poor customers. The cost structure of informal operators may allow flexibility for poor consumers. Traditional utilities usually require up-front connection fees and reconnection

⁹ Water Utility Partnership (WUP) Project no. 5, November 1999, Strengthening Capacity of Utilities to Deliver Water Supply and Sanitation Services, Environmental Health and Hygiene Education in Low Income Urban Areas, Case Study of GWCL – Tanker Owner Metering/Payment Collaboration, Operation of Teshie Tanker Owners' Association

¹⁰ Solo, Tova Maria and Snell, Suzanne, May 1998, Water and Sanitation Services for the Urban Poor, UNDP-World Bank, Washington, D.C.

fees, which can be onerous for the poor. Such large one time expenditures are not usually required by informal vendors. Poor customers are therefore able to control their expenditures directly by controlling their consumption.

This can be seen as an option value in the service provided by the informal vendor. This is because customers value the ability to decide when and how much money to spend on the service, rather than being committed to an up-front cost.

In addition, the poor often operate outside the traditional cash economy and may engage in bartering activities, for example, to meet their needs. Informal providers are also more likely to be able design payment mechanisms that can accommodate non-cash transactions. These issues are likely to concern customers who have limited income and savings.

A combination of privatisation, competition and regulation can push even the dominant utility to implement flexible payment mechanisms in response to the needs of the poor. British Telecom, for instance, offers payment options, such as lower up-front fees for irregular users and pre-paid calling facilities so that consumers can control their expenditure ahead of consumption.¹¹

Other innovations may also be expected as entry is liberalised. The following sections review possibilities in the areas of optional tariff structures and improved payment security.

4.3.1 Optional tariffs

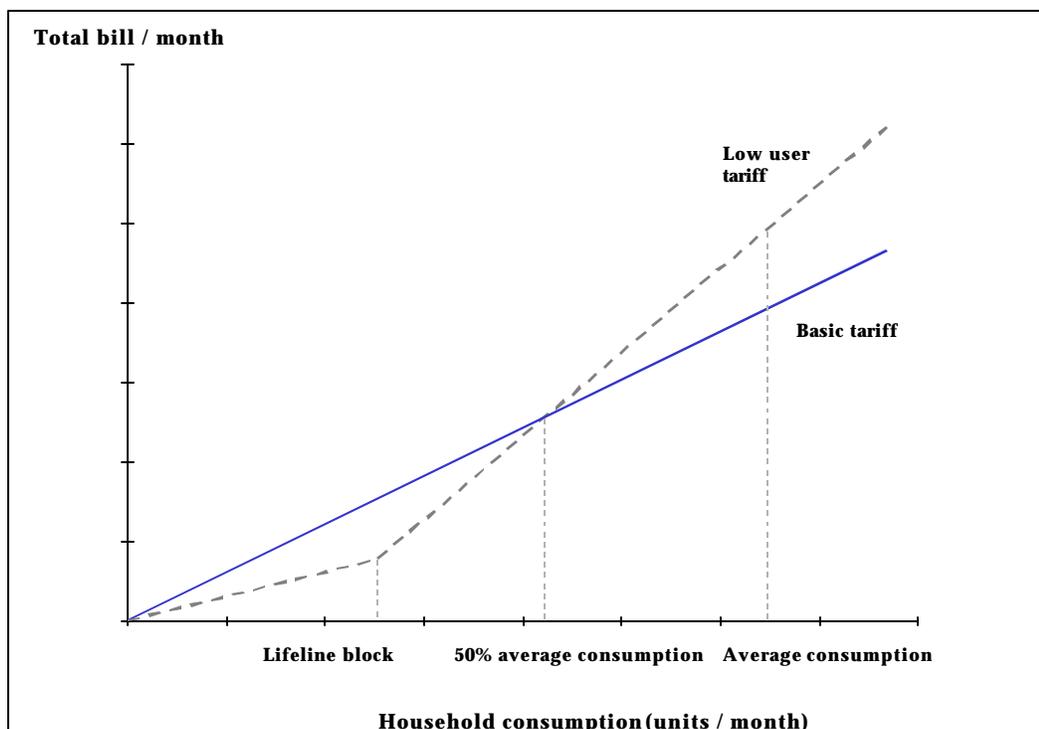
Utilities generally charge a single rate for household use. An optional tariff refers to a rate structure which allows consumers to choose from two tariff options. For example, a customer could choose to pay a lower monthly fee but a higher per unit charge, or to pay a higher monthly fixed fee and a lower per unit charge. If well designed, optional tariffs can lower customers' bills, while at the same time increasing the utility's profits. Monopoly providers seldom implement such services, because they seem risky. However, in competitive markets the practice is common.¹²

Figure 4-3 shows a theoretical example of an optional tariff. The solid line represents the standard tariff, based on a fixed price per unit.

¹¹ Wellenius, 2000

¹² The telecommunications market in the United States is an example.

Figure 4-3: Optional tariff example



The dashed line represents the tariff option designed for low income consumers. Here, the unit charge for low levels of consumption is below the standard tariff. However, the charge for all units after an initial ‘lifeline block’ is significantly higher than the standard tariff.

Such optional tariff mechanisms can be an incentive-compatible, viable alternative to subsidised tariffs. Monopoly distributors could offer them but seldom do. Where competition between retailers exists, optional tariffs are more commonly offered, as entrants and innovators use them to compete with the incumbent.

4.3.2 Payment security mechanisms

Utilities are often unwilling to provide service to predominantly poor areas because of the risk of non-payment. Alternative payment security mechanisms would improve the likelihood of payment and reduce the risk to the service provider.

Monopoly utilities seldom offer innovative security mechanisms, but new entrants could. For example, a large furniture chain, with a strong system for extending and collecting hire-purchase credit, could also become an electricity retailer, and take a charge over household

chattels as security. This allows more financial security in supplying to those without freehold title.

Similarly, pre-payment arrangements reduce the risk to the service provider. In addition to increasing payment security, they allow easier budgeting by the poor household. Again, allowing entrants is often necessary to drive this kind of innovation. For example in cellular services, dominant providers in the United States would not sell to ghetto areas. Competition allowed innovative providers to develop a strategy, which provided service and was profitable. These companies sold cellular handsets to customers below cost, taking a risk that their use of the service would compensate. Then they pre-sold blocks of calls to customers in amounts that were affordable. As a consequence, the vendor had security by way of pre-payment and the customer had a service that was affordable and flexible.

Other examples of this strategy can be found in surprising places. For example, in parts of Africa, people use rechargeable 12 volt batteries for electricity supply. The batteries are recharged for a fee at privately operated charging facilities. While unit costs are far higher than for a grid-based supply, the battery charging approach does offer the advantage of being a pay as you go system, facilitating budgeting. The supplier has the benefit of pre-payment, removing credit risk. For some customers with low and variable incomes, it is possible that these advantages offset the disadvantages of higher unit costs and lower convenience.

4.4 Lessons from experience with small operators

Examples of small, innovative utility and transport operators currently exist all across the developing world. For example:

- in Paraguay, there are about 300 to 400 private individuals and firms (called *aguateros*) supplying good quality piped water to areas not served by the public water company. These range from “mom and pop” operations supplying their own neighbourhood, to larger companies serving as many as 800 connections. A World Bank-UNDP Water and Sanitation Program review concluded “Aguaterias have been operating successfully for a good ten years and quality of service is increasing as experience, competition and consumer activism have increased over time”;¹³
- in Yemen, small scale electricity providers supply rural towns and villages not served by the public utility. These range from individual households who generate for their own use and supply a few neighbours to larger operators supplying up to 200 households, using diesel generators. The result is that electricity use in rural areas of Yemen is very high compared to other middle income countries;¹⁴
- in Jamaica, informal (sometimes illegal) taxi operators provide curb to curb service for many customers who are unable to access the legitimate bus service in their neighbourhoods. The legitimate bus operators often refuse to enter certain urban areas that are prone to violence or certain rural areas, where the roads have not been

¹³ Solo and Snell, May 1998

¹⁴ Ehrhardt, David and Burdon, Rebecca, May 1999, Free Entry in Infrastructure, World Bank, Private Sector Development Department, Washington, D.C.

maintained. These informal taxis are entirely private and have become a popular means for individuals to make a living;¹⁵

- in Malang, East Java (Indonesia), a community based private company operates a small bore reticulated neighbourhood sewerage system with off-site treatment. This system serves about 1,000 households and has been replicated in neighbouring communities; and¹⁶
- in South Africa, a ‘telecenters’ programme offers communal facilities typically with one or more telephone lines, fax machines, computers and other communications and information processing equipment, with training facilities to assist users. The programme was launched and managed by local entrepreneurs or community organisations and are self-financed except for a limited subsidy.¹⁷

Table 4-2 summarises the services small entrants offer and also the problems raised.

Table 4-2: Innovations in market structure targeted to the poor

Function	Possible Innovations	Problem Addressed	Possible Concerns with Approach
Production	Off-grid electricity generation Bore-holes or wells Route-taxis and other para-transit solutions	Provides access to persons not served by the main networks	Informal operators may not adhere to safety or environmental standards
Distribution or Reticulation	Water trucking Small-scale electricity distribution Small bore reticulated sewerage system	Provides flexibility in price and quantity	Informal systems may be unreliable
Retail supply/reselling	Pre-payment cards for services Reselling phone services Community security for payment Optional tariff structures	Provides security for vendor and flexibility for consumer	Arrangements between the formal utility and the vendor could be complicated by issues such as assigning responsibility for customer service, supply quality, etc.

¹⁵ The government of Jamaica has recently reformed the transportation system extensively, including buying back the franchises from the private operators who were providing sub-standard service.

¹⁶ Solo and Snell, May 1998

¹⁷ Wellenius, 2000

While small-scale service providers exist around the world, they are often marginalised. Water carriers, route-taxis, small electricity distributors and the like are often actively discouraged by Governments. They may be illegal, for example where the formal utility has an exclusive franchise. They lack access to subsidies and to the capital markets. They may be disadvantaged by regulatory provisions drafted with formal network providers in mind. Box 4-1 summarises the situation in transport.

Box 4-1: Small transport operators¹⁸

Plying the streets of Bangkok, Lagos, Istanbul and other cities of the developing world are fleets of small, low-performance vehicles driven by private operators that serve low-income neighbourhoods. In some places, environmentally-friendly, pedal-powered modes, like the pedicabs of Manila, provide lifts between markets and squatter settlements, whose narrow alleys and walkways are impenetrable to motor vehicles. In other places like Kingston, Jamaica, station wagons and minivans fiercely compete with public buses, providing curb-to-curb delivery for a premium fare. And in increasing numbers of cities and towns around the world, dozens of young men on mopeds and motorcycles congregate at major intersections, offering feeder connections between mainline bus routes and nearby neighbourhoods at a reasonable fare.

These privately operated, small-scale services are referred to as paratransit. The sector operates informally and illicitly, somewhat in the background, and outside the officially sanctioned public transport sector. In some cases operators lack the necessary permits or registration for market entry in what is a regulated, restricted marketplace. In other cases operators fail to meet certification requirements for commercial common-carrier vehicles, such as minimum size, maximum age or fitness standards. Other violations include lack of liability insurance, absence of a commercial driving permit, and operation of an unclassified or sub-standard vehicle.

Paratransit services are notable gap-fillers. They exist in large part to fill service voids left by the formal public transport operators. Rapid motorisation, poor road facilities and the inability to strategically plan for the future have given rise to horrendous traffic congestion in many mega-cities of the developing world. Formal transport services are rarely up to the task of satisfying escalating travel demands. Most public transport operators exist as protected monopolies, and accordingly lack the incentive to contain costs, operate efficiently, or respond to shifting market demands. Buses are often old, break-down frequently and crawl in slow-moving traffic. It is only because regulations and rules are laxly enforced that unlicensed operators are informally able to step in and pick up where (formal) public transport operators have left off.

¹⁸ Edited extract from Cervero, 2000, "Informal Transport: Mobility Needs of the Developing World". Paper prepared for UNCHS, January.

This discrimination against small operators has its roots in valid concerns. Small operators are often higher cost (per unit) and lower quality, than formal operators are. They often have very poor safety standards. Water may be contaminated, electricity distribution systems may expose passers-by to electric shock, and mini-buses may be overcrowded and poorly maintained. Similarly, small operators may harm the environment by over-abstracting from ground water or emitting excessive exhaust fumes. Small operators may also form cartels and price-gouge consumers.

In light of these problems, it often seemed preferable to do away with small operators all together and replace them with efficient formal sector suppliers. We now know this approach has not worked. Formal utilities have not expanded to provide high quality low cost services in many poor areas. Conventional reforms such as privatisation and unbundling have helped by increasing efficiency and access to capital. But this is no panacea. In many countries incumbent network operators will be too expensive or otherwise inappropriate for poor areas, or they may just take too long to expand service.

In light of this, the best approach will often be to change the structure of the industry by facilitating, rather than discouraging, new entrants, including small and informal operators.

Achieving such structural reform will generally require, first and foremost, regulatory changes. These changes should:

- lift legal prohibitions on entry into the market in most cases;
- remove biases against small operators in tariffs, quality and other regulations;
- provide effective, simple rules preventing small operators from engaging in unsafe or environmentally harmful practices; and
- assist small operators to provide lower cost, higher quality services by facilitating interconnection with formal network operators, where requested.

Key elements of these regulatory changes are discussed further in section 6. Ideally, these regulatory changes would be introduced as an overlay on top of a conventional privatisation and disaggregation programme of the sort described in section 3.

However, even where a country is not yet ready for a wide-reaching reform of an existing utility, it may still be beneficial to facilitate small operators. Small private operators are only likely to flourish if they provide customers with better service than the incumbent is, or serve an area in which the incumbent does not operate. Therefore, facilitating small operators will generally tend to increase the range of service options available to the poor.

5. IMPLICATIONS FOR SUBSIDIES

Another background paper addresses subsidy design explicitly. This paper is therefore not concerned with optimal subsidy design. Rather, the purpose of this section is to show the relationship between choice of structure and choice of subsidy mechanism. To do this, it shows which subsidy types are compatible with which market structures and the policy implications of these relationships.

Changing market structure raises two potential problems for subsidy design:

- “cherry-picking” entrants may make large cross-subsidies unsustainable; and
- it may be harder to deliver subsidies when there are numerous suppliers.

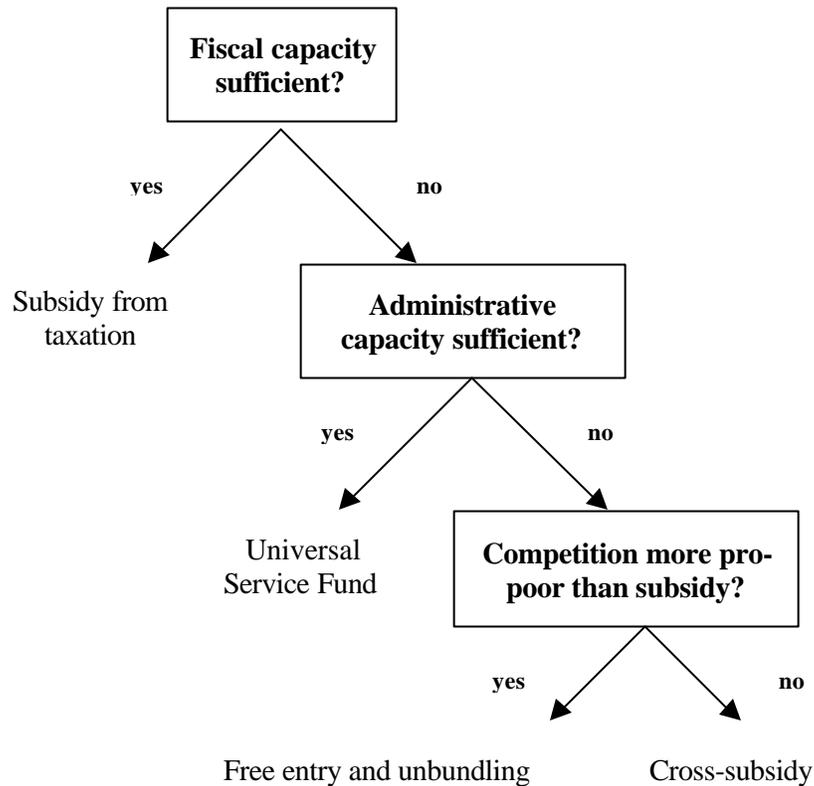
Many utilities use cross-subsidies as an instrument of social policy. If the incumbent is charging rich customers above cost in order to supply poor customers below cost, then “cherry-picking” could occur if competition were introduced. An entrant could supply rich customers below the cost charged by the incumbent, thereby picking off its customers. The subsidy mechanism would break down since the incumbent would have a reduced base of rich customers with which to subsidise the same number of poor customers.

This problem should not be overstated. Economies of scale in network services means that some degree of cross-subsidy will always be possible, even when entry is liberalised. Only large cross-subsidies will become untenable under liberalisation. Where liberalisation does force a reduction in cross-subsidies, there are several options open:

- improve the targeting of subsidies, so that the total subsidy required is reduced, while the truly needy are still assisted;
- provide subsidies from direct taxation, reducing reliance on cross-subsidies; or
- introduce a Universal Service Fund. This is a mechanism designed to preserve cross-subsidies in a competitive market. All service providers must pay a levy into a fund. The fund then pays a subsidy to those utilities supplying poor customers at below cost. This concept has been implemented in utility markets in developed countries. A Universal Service Fund can be implemented in a market structure neutral manner, based on the number of customers served in the various regions. A problem with this approach is that it may be difficult to administer, particularly if small scale providers are involved.

Figure 5-1 shows a decision tree for providing subsidies as a market is liberalised.

Figure 5-1: Decision tree for source of funding



If a subsidy is desired, and funds are available from the general budget, then a tax-payer funded subsidy should be considered. However, if the Government lacks the fiscal capacity for this, then funding for the subsidy will have to come from the industry itself.

The next issue to consider is administrative capacity. If the implementing agency has a high degree of administrative capability, then a Universal Service Fund may be desirable. If not, the Government needs to decide whether competition or cross-subsidies are more helpful to the poor.

If competition will be more effective in delivering service to the poor, then free entry should be encouraged. If not, cross-subsidies may be chosen, and competition restricted.

Regardless of how a utility-specific subsidy is financed, the entry of competitors may complicate the distribution of the subsidy. Administrative complexity may prevent the extension of the subsidy regime to new entrant suppliers. Consider the following example.

In Jamaica, standpipes are put into many rural and poor urban communities by the monopoly, state-owned water utility. The standpipes are metered and the charge is paid by

the municipal government to the utility. The service is free to customers using the standpipe.

Imagine now that other water providers wished to enter the market. The issue is whether the entry of competitors would affect the subsidy. The Government may wish to “level the playing field” by providing similar subsidies to standpipes installed by the competing water vendors. All the entrants’ standpipes would need metering, monitoring and reporting arrangements. Entrants may not be set up to implement careful monitoring. As a result, the system is likely to be difficult to administer.

The burden of administering subsidies multiplies with the entry of competitors. This will be particularly severe if the entrants themselves have low administrative capability and are not able to generate the necessary information. If customers tend to switch between competitors on a regular basis, this will complicate matters even further.

These issues could lead policymakers to conclude that it is not feasible to subsidise customers of entrant utilities. However this does not mean that free entry should be restricted. If a vendor enters a market where subsidies exist and is still able to supply the poor and make a profit, this should be encouraged. The Government may continue to provide a subsidy to customers of the dominant supplier, if this is deemed necessary.

6. REGULATION UNDER PRO-POOR MARKET STRUCTURES

This section discusses how changes in market structure may lead to changes in regulatory design requirements. Another background paper deals with regulatory design in greater detail. We will therefore not attempt to design an optimal pro-poor regulatory structure.

Rather, the key messages of this section are that to allow and support pro-poor structural changes, regulation should:

- allow new entrants to access existing networks on fair terms;
- be light-handed, so as not to burden small and informal providers; and
- reduce, as competition increases.

In a context of free entry and unbundling of the utility industries, the focus of regulation should shift from the traditional regulation of retail supply prices to the regulation of network access. This is because unbundling implies that networks no longer serve customers, per se, but intermediaries.

Networks are critical in a competitive environment since competing utilities may need access to a transmission and distribution mechanism to sell their products. If a transmission company was able to refuse the use of the network or price its use unfairly, then this would limit competition.

Regulation is therefore needed to ensure that network owners do not overcharge or price their competitors out of the market. For example, a community association may wish to provide an electricity distribution network in an unserved area. If the formal utility operator already has an electricity line in the vicinity, the best approach will probably be for the

community association to purchase bulk power from the utility for distribution and resale over the community association's network. To facilitate this, the regulator may need to set rules requiring the formal utility to sell wholesale electricity to the community association and other small scale distributors.

Anti-trust law is also important in the context of an unbundled market, to prevent abuse of dominance by large service providers.

If entry is allowed, small-scale vendors may emerge to provide service to poor areas, which are not being served by the monopoly. Such a provider may, for a time, itself be a regional monopoly, to the extent that no other service exists. The question arises as to whether these small operators should be regulated under such circumstances.

In many of the examples cited in this paper, providers have supplied very small markets, from tens of persons to a few hundred. The traditional approach to regulation in this context may be a significant burden on an informal provider. It is possible that the imposition of rigorous rate of return or price cap regulation on these providers would discourage their entry in the first place.

What can be said with some degree of certainty is that, as long as the dominant provider is regulated, people would be no worse off with the unregulated informal vendor, since they still have the option of using the regulated provider. In other words, a price cap on the dominant utility translates to a price cap for smaller utilities, since they are competing with one another.

Given this logic, it seems that the better option is to benefit from the gains provided by the entrant, rather than impose regulation and risk getting no service at all.

The following two examples are instructive, in that the former is successful, whereas the latter is not:

- In New Zealand, the telecommunications market has simple price regulations on the local loop owned by the dominant service provider. However, new entrants into the market are not regulated. This results in effective regulation on new entrants, since they are competing with the dominant utility, whose price is directly regulated.
- In Columbia, in contrast, the regulator attempts to apply detailed rate of return regulations across over 6,000 water utilities of varying sizes. This approach is difficult and complex. All providers are burdened by regulation but none are regulated effectively. Regulation would probably be improved by establishing categories of providers and by applying light-handed rules for small or informal operators.

In this type of environment, the focus of the regulator may also be important. If the regulator is focused on the dominant provider, it may not properly understand the issues involved in free entry. The regulator may also be "captured" by the dominant provider, insofar as it adopts the perspective of the utility. This problem could be avoided by establishing a regulatory environment that is not focused on the incumbent. For example, in

New Zealand, many utilities are not regulated at all but are simply required to register with the Government.¹⁹

¹⁹ One disadvantage of the New Zealand approach is that it has left interconnection regimes to be settled in court, not regulated. This has led to long and costly disputes over access to networks and may have slowed entry into the market.