

REGULATION OF QUALITY OF INFRASTRUCTURE SERVICES IN DEVELOPING COUNTRIES

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1. INTRODUCTION

This paper examines the role and the design of quality of service regulation in the context of liberalisation and privatisation of infrastructure and improving access to infrastructure services for the poor.^{1,2}

A number of market failures form legitimate motivations for oversight of the quality of infrastructure services, but the corresponding regulations often act against the interests of the poor. In particular, the current approach to quality regulation of infrastructure services in developing countries is often too rigid, to the extent that it focuses on the quality of the services provided to those who are already connected to the network and those who have higher quality expectations. This tends to limit the adoption of and innovation in low-cost solutions for extending services to the poor, whether via traditional infrastructure or alternative suppliers. This in turn raises the cost of access for low-income communities and households and results in lower connection rates and lower service use levels.

To be more conducive to improving infrastructure services for the poor, the institutional arrangements in respect of quality need to make more allowance:

- For the co-existence of alternative suppliers at different quality levels;
- For centralised suppliers providing different customer groups with different quality levels;
- For interventions which are closely focused on the perceived problems (for example, providing information where consumers find quality hard to discern); and,
- Where (and only where) homogenous quality standards are the best instrument, for standards which are set with the interests of the poor in mind.

The structure of the rest of this paper is as follows.

In *Section 2*, we examine the rationale for regulating the quality of infrastructure services. We argue that there might be a role for quality regulation in the presence of market failures, but only if the government can deliver a better outcome than the market, and if the costs of regulation are adequately considered.

We consider the choice of instrument to address quality issues. This should depend on the market failure the intervention intends to correct and on the extra benefits versus the costs of each regulatory

¹ By infrastructure services, we mean services considered to be basic requirements for development and which have traditionally been supplied via networks, i.e. water, sanitation, energy, telecommunications and transport.

² We note that this topic has not been explored in a satisfactory manner to date, since the debate about improving access usually tends to focus on the price, rather than on the quality of the service, without taking account of the potential relationship between the two. The focus on centralised infrastructure provision also tend to obscure the fact that quality of service provision can be varied to better serve the needs of the poor.

instrument. Whatever the instrument, differentiated quality requirements may serve the poor more adequately.

In **Section 3**, we review the experience of quality regulation of infrastructure services in developing countries. We discuss the record of main utility providers in terms of quality of service and point to cases where they have diversified supply quality in order to meet the needs of the poor. We look at alternative providers' quality of supply for services to the poor and at ways they have been regulated.

In **Section 4**, we recommend an approach to quality of infrastructure services in developing countries, with a view to addressing the needs of the poorest customers. We also highlight areas where further research is required so that quality issues can be approached in better ways in the future.

In **Appendix A**, we present a checklist of instruments governments may want to consider when deciding how to implement their approach to quality of infrastructure services.

Appendix B contains a summary bibliography of sources on the topic.

Note: examples are shown in Italics to illustrate the discussion. The reader can follow the logical flow of the argument without reading these examples.

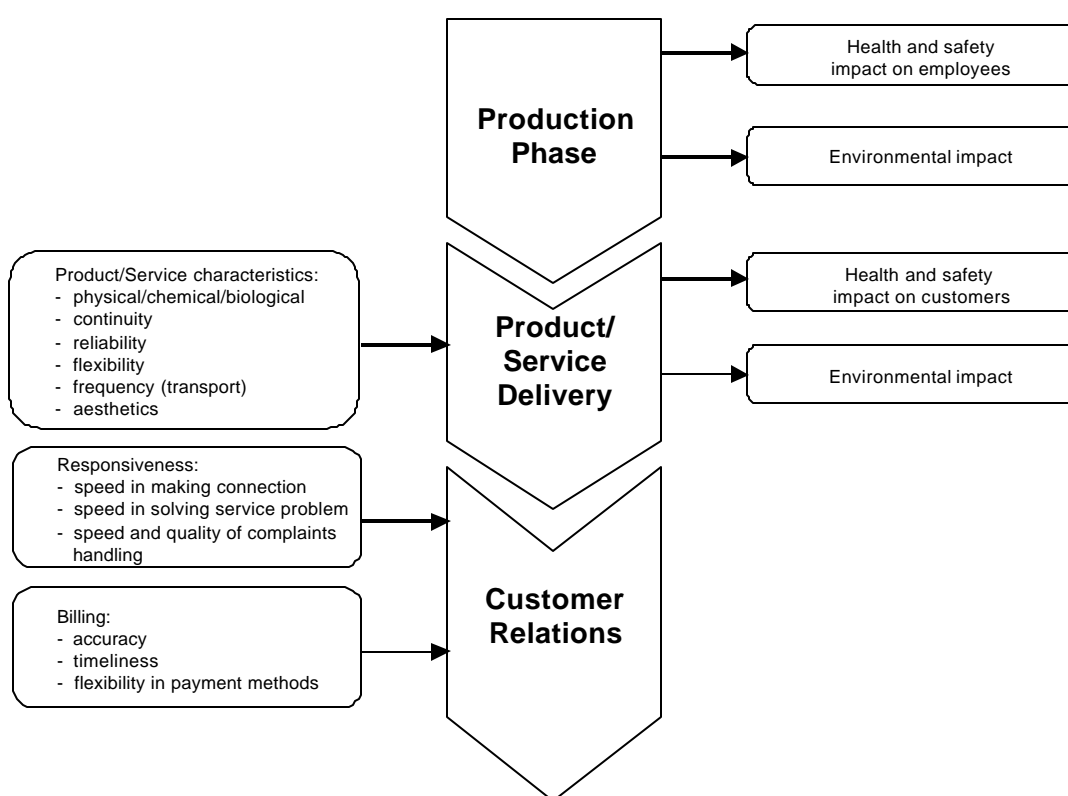
2. RATIONALE FOR QUALITY REGULATION

Quality has many dimensions and is a more complex matter to regulate than price. Quality regulation may be suggested by the presence of market failures, but is only worthwhile if the government can thereby deliver a better outcome than the market, and if the costs of regulation are adequately considered. Instruments for quality regulation must be selected from the vast panoply available, according to the type of market failure they intend to correct and without imposing costs in excess of benefits. In many cases, differentiated quality requirements may allow the poor to be better served.

2.1. What is Service Quality?

The quality of infrastructure services can be assessed over a number of dimensions, as shown in the figure below.

Figure 1: Quality Dimensions of Infrastructure Services



For quality dimensions such as the impact on health and safety, or the impact on the environment (on the right-hand side on the figure above), it might be possible to define minimum quality requirements relatively objectively. For example, water consumers do not expect the water they drink will make them sick. Consumers of urban bus services do not expect to be injured during their journey.

For requirements above the minimum and for other dimensions such as the characteristics of physical service and customer relations (on the left-hand side on the figure above), quality requirements are a more personal matter. Offering different levels of quality for these dimensions is equivalent to changing the economic value of the service, hence we would expect different willingness-to-pay for each customer, and by aggregation, different willingness-to-pay by customer groups. For example, poor communities might decide that continuity of water service is not an absolute priority. They might decide that they would rather get cheap intermittent service from a network provider instead of getting no network service at all (where unaffordable high quality is offered) and having to rely on informal water vendors. Continuity of service, therefore, is a service characteristic that has the potential to be varied in order to provide more affordable solutions to the poor.

2.2. Why Regulate Service Quality?

Most dimensions of quality that people care about can be adequately handled through market mechanisms. In a well-functioning market, each consumer is likely to obtain the level of quality he requires at a price that adequately reflects his quality preferences. The price will depend on the cost of providing this given level of quality, and on what the consumer is willing to pay for that service.

Conditions for a well-functioning market, however, are not always fulfilled for all quality dimensions of infrastructure services, due to the presence of “market failures”. Such failures might stem from the presence of market power, the imperfect sharing of information, and the existence of external effects. The fact that most infrastructure services are jointly provided and consumed over a network also raises some concerns for the appropriateness of the quality of the good or service delivered.

In the presence of such market failures, relying solely on supplier-customer transactions might lead to a level of infrastructure service provision below what would be socially optimal. This suggests that market failures may be worth correcting through regulatory intervention, but only if such intervention can achieve a better outcome than the market alone, with all its imperfections.

In developing cities, almost every imaginable urban transport mode is available (from underground systems, public buses, private minibuses, tricycles, rickshaws, taxis, etc...). If consumers are not well informed about the safety of the transport mode they adopt or if different modes generate different environmental costs, and these differences are not signalled in transport prices, consumers might choose options which do not lead to the social optimum. For example, a poor consumer might choose to travel by tricycle, as it is the cheapest option available to him, not realising that the accident risk is very high and that it contributes significantly to increasing traffic congestion. Or he might be conscious of these issues, but discount them relative to the price as a decision factor. This suggests that this transport mode might need to be regulated to increase the safety of its users, and to better organise their impact on traffic.

We now examine some of the relevant market failures and set out the role for quality regulation.

Market power

Some infrastructure services have natural monopoly characteristics, due to economies of scale (one network is more economic than two) and scope (co-ordination is often cheaper within one organisation than using a transfer price between two organisations). It is typically the case of water or gas distribution networks for which installing pipe networks in parallel inevitably raises costs.³

For these services, customers often have no alternative available at realistic cost and quality if they are not satisfied with the quality of network service provided. This suggests regulation might be required in order to ensure that the service quality they get is appropriate.

According to economic theory, unregulated monopolists would typically charge higher prices than if they were in a competitive environment.⁴ The quality of the service they provide as compared to a provider in a competitive environment could be either higher or lower, depending on consumers' demands for varying amounts at varying quality levels and the costs of providing these various quality levels. A monopolist would typically offer a price/quality bundle that enables him to maintain demand at levels which maximise his monopoly rents (if demand fell significantly as a result of poor quality, monopoly rents would be reduced).

When tariffs are regulated, the nature of the regulatory regime generates different types of incentives to deliver quality. Under a price-cap regime, monopolists have an incentive to reduce their costs in order to increase their profits. If quality is not regulated, an easy way to achieve cost reductions is to lower quality, which will improve profits provided this does not lead to a fall in demand. Typically, a monopolist could choose to give customers lower service standards or to make savings on system maintenance, which would affect supply reliability in the long run. This can be harmful for customers who do not have alternative sources of supply at realistic cost. Under a cost-plus regulatory regime, a monopolist may have the incentive to make expensive investments in quality improvements so as to earn returns on a higher asset base. This can raise the total price of service and potentially reduce access by the poor. Under both regimes, regulation of quality may help ensure that the monopolist provides the appropriate level of quality, but only if the benefits of regulation outweigh the implementation costs.

Imperfect information

Consumers can determine the quality of most infrastructure services only after they have received them. They can be defined as "experience goods" as opposed to "search goods", for which quality can be assessed before having consumed the good.⁵ For example, power surges or difficulty in

³ However, some activities carried out by infrastructure providers, such as electricity generation, do not necessarily present such characteristics and are increasingly opened to competition.

⁴ In special circumstances, they might also charge lower prices. For example, if monopolists are under the threat of competition, they might price their services in a predatory way in order to eliminate the risk of competition.

⁵ Laffont, Jean-Jacques and Jean Tirole (1993) "A Theory of Incentives in Procurement and Regulation", MIT Press.

completing telephone calls only become obvious after consumers have contracted with suppliers and incurred subscription and usage fees. Poor quality service might impact the provider's reputation and reduce sales, but only in the long run.

This problem of imperfectly informed consumers becomes critical when health and safety are at risk. For example, consumers cannot easily determine whether the water they are consuming is contaminated, and railway passengers cannot determine the safety risks of the system until it is too late. In these areas, it may be useful for governments to intervene to provide information about the quality of infrastructure services or to impose minimum quality standards. Public diffusion of information might be a more effective way of ensuring adequate provision of quality than the setting of standards, acting through companies' reputations and hence their competitive position, where there is some competition pressure, or the equivalent in the form of (say) a strong consumer lobby.

Externalities

The provision and consumption of some infrastructure services involves social costs or benefits that are not directly borne or enjoyed by the producers or consumers, and not ordinarily passed on to customers through the price of service. In the economic jargon, these costs and benefits are called "externalities" or "external effects". Externalities can be either positive or negative: a positive externality leads to an increase in welfare of those affected, whereas a negative externality results in a decrease in their welfare.

For example, providing access to sanitation could prevent an epidemic from spreading thus creating a positive externality. On reverse, an unsafe nuclear reactor may pose a threat to the well being of people who do not have access to the electricity network. If these costs are not reflected in the price paid for electricity by those who have access to the service, it creates a negative externality.

External effects introduce a wedge between private and social costs and benefits. As a result, private producers will tend to over or under-supply quality. Some form of government intervention may help to ensure that producers, and through them consumers, face the full social cost of their activities (or at least produce and consume as if they did), and that the appropriate level of service quality is achieved.

Joint provision and consumption

Many infrastructure services are jointly provided due to economies of scale and scope in providing these services. Such factors imply high costs of quality differentiation (relative to fully competitive markets) so quality standards tend to be homogeneous and all consumers have to consume the same level of quality. For example, water quality is jointly consumed: if high quality water is pumped into the system, it is not feasible to stop particular customers from benefiting from the high quality supplied. Also, network pressure should be sufficient so as to provide pressure points for fire prevention and control, a benefit that all citizens enjoy.

Where the good or service is jointly provided and consumed, most customers will be getting too much or too little quality compared to their individual optimum. Intervention may be the "fairest" way to

arrive at the single quality standard. However, any “high costs of differentiation” argument given by utilities for avoiding product differentiation will need to be sceptically viewed.

2.3. Instruments for Addressing Quality

Confronted with market failures, governments can choose from a variety of instruments in order to try and get closer to the socially optimal outcome.

Instruments for addressing quality

Instruments for addressing quality may include the following:

- Licensing and certification rules (to regulate market entry);
- Minimum quality standards;
- Provision of information to consumers;
- Quality signalling by private providers, such as the establishment of reputation through brand names or the setting up of self-regulating producers’ association;
- Liability regimes (for product or service failures).

The formulation of licensing rules and quality standards differs from case to case according to the degree of control that the regulatory agency retains over the private participant. It is generally deemed preferable to leave a maximum degree of flexibility to the private entity, so as to stimulate its innovative capacities and make full use of the expertise acquired on international or local markets. We deal in more detail with ways of defining licensing requirements and quality standards in Appendix A.

Quality signalling by private providers should be seen as a substitute, or useful complement, to regulation imposed by the government, especially when institutional capacity is weak. Supplier associations may choose to regulate the quality of their members, by granting them certificates for compliance. In this case, quality turns into a competitive characteristic of the providers. Also, some suppliers who enjoy a monopoly position in their service area, might voluntarily choose to increase their quality commitment to provide a signal to their customers.

Water companies in the UK have published customer charters, where they commit to pay specified compensation on top of what is required by the regulator, every time they contravene a quality requirement.

Taking into account the costs of regulation

Regulatory instruments have associated regulatory costs, depending on how prescriptive they are. In developing countries, enforcement of quality standards can be particularly difficult and costly. In many cases, it can be argued that quality regulation is a luxury that only rich countries can afford and that the costs of regulating small providers is not compensated by the potential benefits.

Various sorts of costs should be considered when developing a system of rules designed to achieve a particular quality standard. The costs imposed upon operators in complying with the standard need to be assessed, since these costs are to be passed on to consumers, including the poor. The costs of developing, monitoring and enforcing quality standards also need to be taken into account. Administratively complex schemes may be inappropriate in developing countries where governmental capacity is limited.⁶

Choosing the appropriate instrument

The choice of instrument should depend on the market failure it is desired to correct or to reduce, as well as on the instruments' associated costs.

To deal with market power, governments may allow competition and encourage entry.⁷ This would not resolve the issue of quality differentiation between customer classes altogether, since the possibilities for differentiated quality might be a key aspect to take into consideration when designing the new market structure. Typically, new entrants would be allowed to enter if they obtain a licence to operate from the government, and the granting of such a licence would generally involve a number of quality requirements to be met. Such licensing requirements could potentially be limited to quality dimensions likely to be beset by information asymmetries and externalities, given that companies are likely to compete on quality dimensions that modify the economic value of the service, such as product characteristics and customer relations.

Information asymmetries can be reduced through improving consumer education and publishing objective information on service quality, in the form of league tables and annual reports. Private providers might develop this kind of instrument themselves, as a way to enhance their reputation. If the information asymmetry problem cannot be solved in this way, or providers still have an incentive to under-cut on quality, the government might consider introducing service standards.

The importance of information asymmetries can also be reduced in some cases by establishing a regime where producers are liable to consumers for product or service failures. The threat of lawsuits may be a powerful incentive to perform. However, this mechanism tends to be costly and time-consuming, and requires reliable court systems, so it may not often be relevant to the poor in developing countries.

⁶ In Appendix A, we review which type of institutional designs and enforcement mechanisms might be most appropriate for quality regulation, especially in developing countries.

⁷ A separate paper for this Conference deals with market structures for improving service options to the poor. Ehrhardt David (2000), forthcoming.

Externalities can be dealt with through standards or taxation and subsidy schemes. Some focused interventions may also be appropriate (e.g. designation of a common dump for solid waste, or a treatment plant for collected liquid waste). In order to leave maximum flexibility to private participants, it might also be possible to define outcome standards, and to allow operators to trade between themselves to achieve the social optimum (for example, emission of pollution permits to deal with the negative externality caused by pollution).

Table 1: Market Failures and Instruments for Regulation

Market Failure	Effect on quality	Instrument
Market Power	Over/under-supply of quality	Encourage entry
	Focus on more profitable market segments	Licensing: allow differentiated quality objectives
Asymmetric Information	Health and safety risk	Publish information to affect reputation
	Unsatisfactory service	Enforce output standards
		Establish liability regimes
Externality	Environmental and health impact	Output and outcome standards
	Congestion (Transport)	Focused intervention (for example, construction of dump site)
	Accessibility (Transport and Telecoms)	
Public good characteristics	Joint-consumption: Difficult to differentiate quality	Publicise decentralised solutions

2.4. Differentiating Quality to Meet the Needs of the Poor

When regulation is considered as a way of addressing quality issues that are not well-handled through transactions, the objective of the quality arrangements should be to maximise the producer and consumer net benefits from service quality, with appropriate allowance for wider social costs and benefits to correct for external effects. These costs and benefits might differ between social groups, which means that quality requirements might need to be diversified, so as to reduce the inefficiencies that could result from blanket under or over-provision of quality.

Costs and benefits attached to quality

The price/quality package demanded by customers will vary with a number of important factors. Feasible quality levels will be influenced by the network's physical characteristics, which drive costs, and also the sector and regulatory structures. When suppliers are private, quality targets should not be set at the expense of their financial viability. Finally, factors affecting the poor's willingness-to-pay, such as the availability of direct or cross subsidies, will need to be taken into account.

When quality regulation is introduced, it will tend to increase (or at least, not decrease) production costs and hence, the price of supplying the service.

In the last ten years, the European Commission has passed a number of directives aiming at improving the environment through tougher sewage treatment standards or at improving human

*health through more demanding drinking water quality requirements. These regulations are one of the key determinants of price increases in the privatised UK water sector, and elsewhere in Europe.*⁸

In addition, the costs of running the regulatory regime will need to be included when considering the various possible quality arrangements. Once control costs are included, a simple scheme might achieve the same final net benefits as a more detailed one, even though the achieved level of quality is lower.

It will only be worthwhile to increase control costs if the benefits are greater. All benefits from quality standards need to be taken into account, including the positive externalities resulting from the imposition of quality requirements. For instance, if quality regulation reduces the number of power shortages and prevents damages to industrial equipment or household appliances for which users would not receive compensation, this benefit should be taken into account to determine whether this quality requirement is worthwhile or not.

This being said, comprehensive studies of willingness-to-pay and external or uncompensated costs and benefits of various production alternatives, including low-cost ones, are rare. It is very unlikely that a government or regulator would have access to sufficient information to determine with much accuracy where the optimal quality standard should be set, i.e. at the point where private and social benefits are maximised. From a policy point of view such studies would be useful in many cases, but they are often too costly to produce. As much as possible, the optimal quality objective should be revealed by allowing people's real choices to demonstrate what they want. One thing that markets (albeit informal ones) have already demonstrated is that customers have very different preferences, and that quality might need to be differentiated in order to maximise welfare.

Demand and costs of utility services for the poor

It is generally true that demands and costs vary widely from one area to the next in developing countries, as income levels and operating conditions are extremely heterogeneous. Those considering regulating quality need to recognise this reality and to allow for the delivery of various price/quality bundles.

Some empirical studies have shown that, for utility services, the poor are willing to pay a relatively high percentage of their income compared to the rich, even though they would usually pay less than the rich for the service (due to cross-subsidies⁹ and reduced consumption levels).^{10, 11} The poor's

⁸ For example, the Urban Waste Water Treatment Directive, aimed at preventing environmental damage done through discharge of urban waste water and waste water from industrial processes, is likely to require ECU 130 billion in investments over the period 1993-2005 for European countries. European Union (1999).

⁹ To the extent that direct and cross-subsidies are focused on those of the poor who are connected to the main service provider, the unconnected poor are likely to be paying the highest price as a proportion of their income.

¹⁰ Kristin Komives, Dale Whittington and Xun Wu, "Infrastructure and the Poor", Presentation of results from data on infrastructure access in LSMS survey for a sample of 15 countries. See paper: "Infrastructure Coverage and the Poor: A Global Perspective".

willingness-to-pay is lower for services such as sewage treatment for which the benefits are only indirectly enjoyed (through an improvement in the environment rather than in very local living conditions).

On the cost side, it is often the case that poorer areas are more expensive to serve, be they urban slums located in inaccessible areas such as hillsides surrounding a metropolis (as in La Paz-El Alto or Lima) or isolated rural areas.

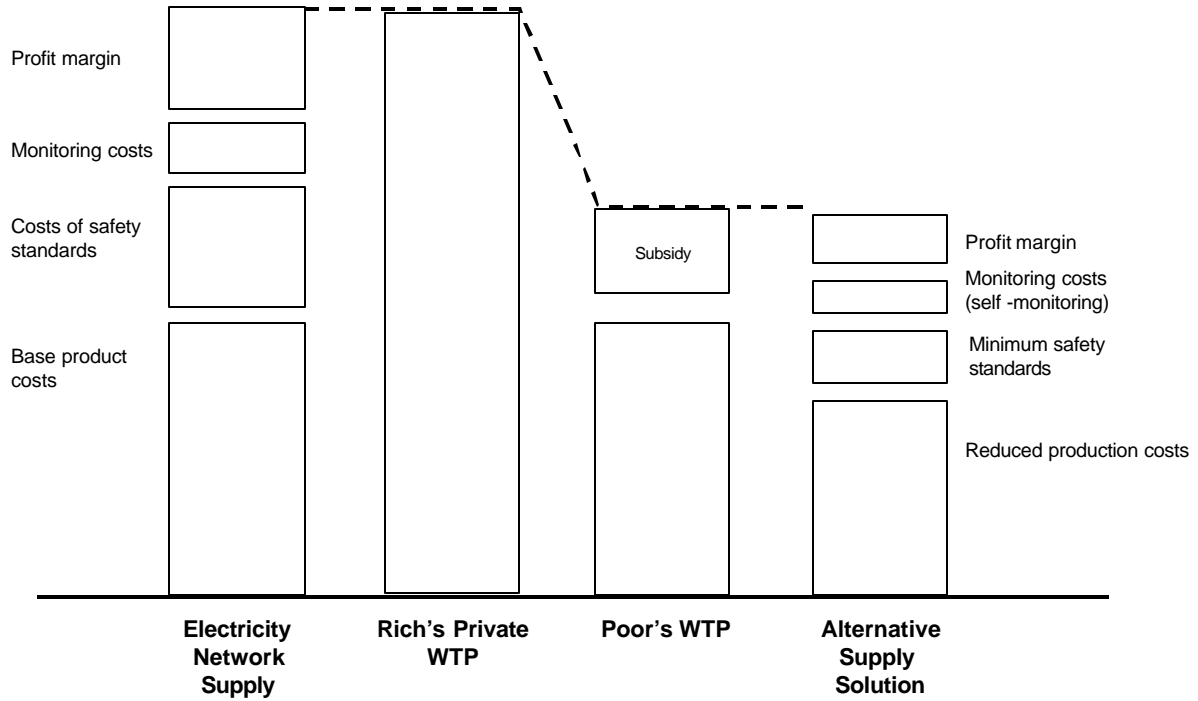
Low consumption levels often mean that one standard connection per poor household is an expensive proposition for the utility provider, because under standard tariffs, low consumption levels will not be sufficient to cover the costs. The risk of fraud and non-payment is often higher with the poor, increasing costs further, especially if special payment methods are not implemented.

Diversifying service quality for improving access for the poor

If a private provider wants to serve the poor and remain financially viable, it must diversify its pricing and/or its supply arrangements. This can involve charging higher prices to the poor to reflect the real supply costs (which might not be politically acceptable) or finding alternative solutions, such as group supplies or lower quality levels, to reduce supply costs.

In the figure below, we illustrate how the use of a low-cost solution (with lower quality) would enable the provider to adapt to the poor's willingness-to-pay for the service. We assumed that monitoring costs would also be lowered (through the use of self-monitoring by the provider). Despite this reduction in production and regulatory costs, a subsidy scheme might still be needed.

¹¹ The poorest households in Port-au-Prince in Haiti were found to spend some 20% of their income on water. In Kenya, on average, households were spending 9% of their income on water vendors, who accounted for 95% of the water supply in terms of revenues. See Whittington, Dale, Donald T.Lauria and Xinming Mu (1991).

Figure 2: Relative costs and willingness-to-pay between the rich and the poor

Experience has shown that low-cost alternatives can provide a viable alternative for providing services to the poor at a lower price, on the assumption that they would prefer a lower level of quality if it meant a lower price. In the following section, we review the issues that have emerged in providing quality options for the poor, either by the main provider or by alternative providers.

3. EXPERIENCES AND ISSUES

In this section, we review the experience of quality arrangements for main utility providers and for alternative providers, and discuss issues raised by the current prevailing approach in the light of our previous discussion.

Quality arrangements are typically designed for market structures dominated by monopolistic providers rather than with competitive entry and diversification in mind. Traditional utilities focus on providing a standardised product, typically at relatively high (actual or aspired) quality levels, taking advantage of economies of scale and scope in production. This has tended to limit access to the network for the poor. There are, however, some examples of main utilities attempting to provide diversified price/quality bundles which may warrant more attention.

Various alternative providers have emerged in order to meet the needs of the poor, with services of varying levels of quality and price. The current form of regulation of these providers ranges from exclusion to neglect, and is often inconsistent with the interests of the poor. In a few cases, there have been careful policy developments designed to encourage the co-existence of such suppliers with traditional utilities.

3.1. Quality Supplied by Main Utility Providers

The context: reform and privatisation of main utility providers

An important reason for reforming or privatising public providers of infrastructure services is the need to improve the efficiency and quality of service, which is often deemed to be highly inadequate. This does not necessarily mean that formal quality of service requirements for public providers are low, but enforcement is often a problem, associated with a confusion of roles between government bodies and a lack of institutional capacity.

When private participation is introduced, the tendency is to focus on the service provided by the main provider and to set high expectations for quality levels. The problem of access for the poor is usually tackled through tariff structures, with cross or direct subsidies for poor consumers (as previously noted, these are usually no help to the unconnected customers). Quality arrangements are defined in sector legislation or in the contract with the private operator. Reform of the main provider often goes hand in hand with the setting-up of independent regulatory agencies, with better capacity for monitoring and enforcing quality arrangements than the government bodies previously in charge.

As a result of privatisation, governments tend to become tougher and to require the application of formal standards, despite their impact on costs. They do so especially if they have a financial incentive in the form of receipts from penalty payments or an electoral incentive in the form of championing customers' interests. Therefore, the costs of quality usually go up following privatisation, even if the quality standard itself has not been modified.

In Argentina's electricity transmission sector, there is a detailed schedule of penalties to be paid by the companies in case of outages. These penalties vary according to the importance of the affected assets and the length of the outages. They are capped at 50 per cent of monthly revenues, but the high payments made indicate that the standards were set at ambitious levels, given the state of the assets.¹²

Quality standards are often set high...

In the context of reform and privatisation, quality standards (and technical standards in particular) are often set at a high level. This focus on high quality service might help with improving service for a large share of the population, but it may also be inconsistent with unsubsidised access by poor households to infrastructure services. A number of the reasons why high standards are adopted take no account of the interests of the poor.

One reason for high standards is that main private utility providers have often inherited operating structures and tariffs from large-scale organisations, not used to considering low-cost options or alternative provisions at the community level. The culture in such big organisations is often to derive "professional pride" from top quality uniform service, not from bold innovations in low cost alternatives.

Second, investment designs are often based on developed countries' standards. Quality standards for design works are often driven by engineering specifications, such as housing standards for the installation of electrical wiring or the minimum depth for pipes underneath roads. Usually, these engineering norms were designed in developed countries. The elite's expectations also push towards the adoption of developed countries' standards of service. Lower-cost alternatives do exist in developed countries, but they are no longer the norm so they are not necessarily considered when setting standards in developing countries.

In-house septic tanks are still often in use in rural areas in France or the USA and many water providers (for example in Australia) do not currently meet the current WHO guidelines on drinking water quality. These guidelines are usually regarded as the minimum standard in developing countries.

Finally, large private utility providers tend to focus on high-margin customers, and often have no financial incentive to develop low-cost provision. They have generally entered the market through international tender processes, to carry out large-scale investments. In some utility markets, however, the optimal scale of production has declined and even main providers now consider these small-scale low-cost alternatives much more seriously.

... but standards can also be low by comparison with developed countries...

¹² Klein, Michael dir. (1998).

There are a number of areas where service quality falls short of developed countries standards or of the elite's aspirations or businesses' needs. In particular, delivered customer service standards still lag those in developed countries, due to local practices and the costs of improving them.

The privatised electricity company in Senegal (SENELEC) has 7 days in urban areas and 20 days in rural areas to install a new connection following a customers' request. This can be compared to standards for electricity companies in the UK, where they have 3 days to install a connection for domestic customers and 5 days for non-domestic customers.

One area where formal standards have consistently been much lower in developing countries is the area of environmental standards, and there are large informal differences occurring through different enforcement levels. Levels of wastewater treatment in most developing countries are extremely low, with no treatment at all in many countries. There would be health and environmental benefits from tightening these standards, but poor customers would not necessarily be able to pay.

Some main utility providers have tried to diversify quality to improve access...

In some cases, main utility providers have tried to vary service quality in an attempt to make their services more affordable for poor customers. This diversification can take several forms: through the provision of more flexible customer service arrangements or through the use of low-cost technologies to reduce the cost of service, at the expense of quality. Consumers may also agree to receive the service during a reduced number of hours every day in exchange for a discounted price.

In the UK, electricity and gas utilities have for some years offered pre-payment cards to their customers. This means that supply can be interrupted if the payment is not made. Continuity of service suffers but it allows customers to control their expenses with more accuracy.

In some cases, diversification has required entering into agreements with alternative providers or community organisations, which tend to be more specialised in the delivery of low-cost services.

Aguas Argentinas, the concessionaire of water and sanitation services in Buenos Aires since 1993, had its first direct experience working in partnership with a low-income community, an NGO and a local government when taking over the system put in place by the Barrio San Jorge.¹³ In this barrio, the community had developed a double system of water provision: one system connected to the existing network to provide small volumes of potable water, and another which can draw on groundwater sources, too salty for drinking but which can be used for washing and bathing. The sewerage system was based on a combination of cesspits within each household and a small-bore sewer pipe network. Aguas Argentinas took over the operation, maintenance and repair of the system and the residents now pay the company a fixed rate for these services. Since, Aguas Argentinas has introduced this low-cost methodology to other poor areas of the city. In many cases, it takes over

¹³ Snell, Suzanne (1998).

networks built by communities at lower costs (but which respect the minimum quality standards) in exchange for which customers receive a discount on the price of the service.

Interesting cases of collaboration between the main utility providers and small-scale entrepreneurs have also emerged in the telecommunication sector through the development of public telephone booths.

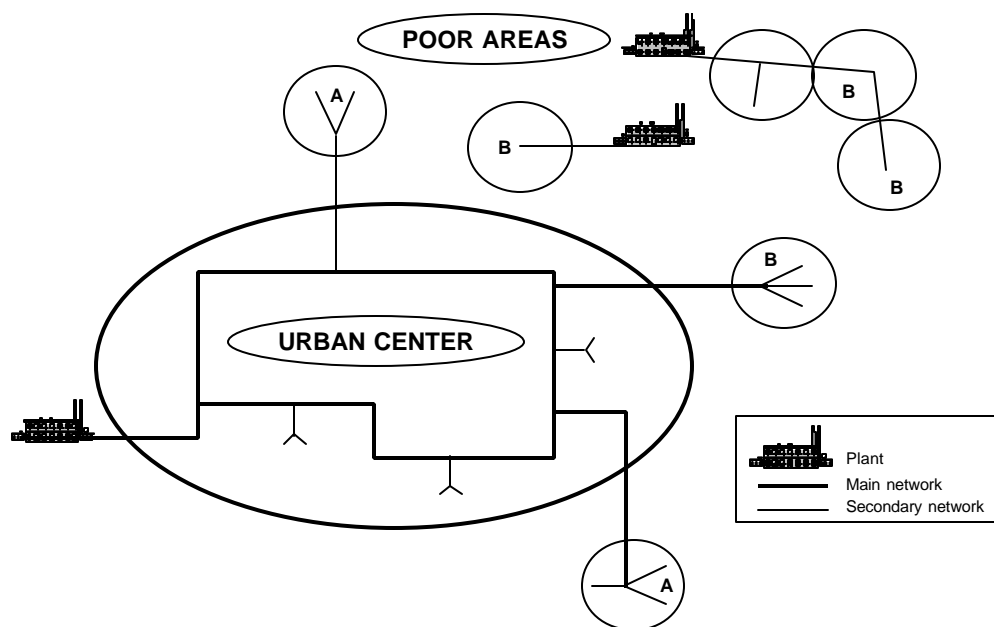
In Senegal, small private operators run telecentres and rent lines from SONATEL, the national operator privatised in 1998. These telecentres have grown very fast, and produce about 4 times more revenues per line than for individual lines run by SONATEL. Some of SONATEL's customers prefer to limit their personal subscription to local communications and to use the telecentre for international communications, in order to lessen the risk of termination of their contract due to payment problems. For SONATEL, this has proved to be an attractive venture, since these lines generate more revenues per line and bills are collected every month, instead of every six month.¹⁴

...but implementation issues often stop them from doing so

For infrastructure services which tend to be jointly consumed (such as water quality or the voltage level of an electricity network), it can be technically difficult to vary the quality of service for different social groups or service areas.

On the figure below, we show the situation where a main production plant feeds into the network for the whole of the urban centre. Some poor areas (A) are fed from this main network, so quality characteristics such as voltage consistency or drinking water quality cannot be differentiated easily for these peripheries. Only characteristics such as reliable hours of service, payment methods or customer services could be differentiated for these areas. For other areas (B) which are supplied by other plants (which might belong to the main provider or alternative providers), quality of supply could be varied more extensively.

¹⁴ Zongo, G. "L'impact socio-économique et financier des télécentres privés: le cas du Sénégal".

Figure 3: Network issues from differentiating quality

Even when main utility providers wish to diversify quality and to offer low-cost alternatives to their existing clients, it can be difficult to do so in practice. First, cost differences driven by quality differences might be difficult to reflect in tariff terms. If quality differentiation affects the level of initial capital costs, it can be relatively easy to relate quality differences to tariffs by varying the connection charge. However, if quality variations lead to differences in marginal production costs, these might be more difficult to reflect through varying the volumetric charge. Variations in the quality of service provided through the network is likely to have a relatively small impact on operating costs, and the administrative cost of reflecting these cost differences in tariffs might be higher than the savings. For example, if lower quality means restricted supply hours, sophisticated meters would need to be installed in order to identify the time profile of consumption.

In addition, identifying the target group for lower-quality lower-cost service might prove difficult. There is little socio-economic data in most customer registers. Poor customers may be located in well-defined areas as in our Figure 3, but often, poor areas are mixed with very rich ones within the same administrative unit. As in the allocation of subsidies, the important issue then becomes to target the lower price (and the associated lower quality) onto the population that is most in need.

Offering a choice to customers is the best way of offering to each customer the most appropriate price/quality bundle, but individual choice is often not possible, or too costly. It is therefore important to develop methods for expressing quality choices at group level. Several methods can be considered for doing so: the transfer of experiences from other locations, deliberate experiments (for instance, voluntarily varying the quality of service in a number of locations and measuring relative customer satisfaction), group and community consultations, survey studies or through the political process.

3.2. Quality Supplied by Alternative Providers

3.2.1. What are alternative providers?

Alternative providers have emerged where traditional utility providers have failed to provide access at conditions of price and quality which satisfy the needs of the poor.¹⁵

There are many types of such providers. They can either have their own production system (small independent power producer, or water suppliers with their own wells) or have entered into a bulk supply agreement with the main utility provider and be involved in retail supply (water sold by trucks or by the bucket, for example).¹⁶

One survey of alternative water and sanitation providers in the water sector covered twenty small private providers in Africa, Asia and Latin America.¹⁷ This survey highlighted the great variety which distinguishes them in terms of sector of activity (water or sewerage), institutional structure (community-based businesses, NGOs, commercial entrepreneurs, etc) or relationship to the main utility provider (bulk supply agreement, or no relationship at all, when they have their own wells).

These providers have taken up a large share of the market, especially when access to formal services is relatively low. For example, it is estimated that between 20 and 30 per cent of urban dwellers in the Third World buy water by the bucket, either from licensees of standpipes owned by businessmen (as in Nairobi in Kenya) or from traditional water carriers.¹⁸

3.2.2. Why do the poor use alternative service providers?

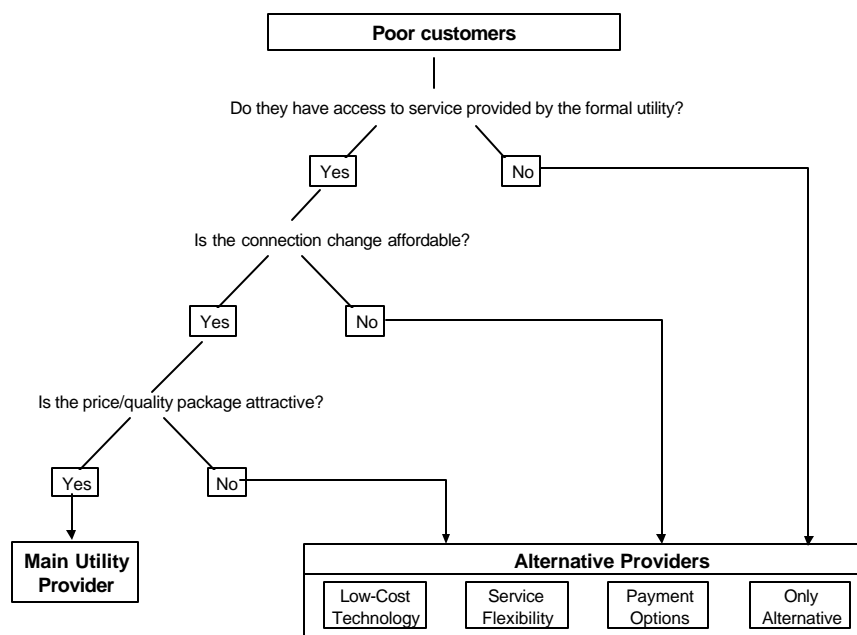
Circumstances in which the poor might resort to alternative providers may differ widely, as shown in Figure 4 below. It is not always the case that low-income customers can effectively choose between various price/quality bundles. Depending on these circumstances, the price/quality bundle purchased by poor customers and the type of providers they will obtain it from might be very different.

¹⁵ Examples of alternative providers include small-scale electricity generation (diesel generators, household solar panels), water delivery by tankers or through low-cost piping and access to telecommunications through prepaid wireless phones or privately owned local phone booths. Brook Cowen, Penelope and Nicola Tynan (1999), "Reaching the Urban Poor with Private Infrastructure", Public Policy for the Private Sector, Note N. 188, June 1999.

¹⁶ In the latter case, a wealth of interconnection issues arises. For water providers, for example, these would concern the availability, quality and price of bulk water. In the electricity sector, a power supplier using small-scale generation to serve a low-income settlement might seek back-up from an existing utility.

¹⁷ Snell, Suzanne (1998). "Water and Sanitation Services for the Urban Poor. Small-Scale Providers: Typology & Profiles", UNDP-World Bank Water and Sanitation Program, December 1998.

¹⁸ Cairncross, Sandy: Water Supply and the Urban Poor, in "The Poor Die Young", Housing and Health in Third World Cities, Earthscan, 1990.

Figure 4: Alternative providers for poor customers

As shown in the figure above, alternative providers might be the only alternative for poor consumers who do not have access to conventional network providers, or for those who potentially have access, but for whom the connection charge is unaffordable. In the latter case, alternative providers offering more flexible payment options, and which allow the phasing of any connection charge over a number of instalments in particular, will be attractive.

For those who are effectively connected, the price might still be too high due to high quality requirements, therefore limiting service use levels. As a result, they might resort to providers who use lower cost technologies or offer a more flexible service, and more flexible payment terms in particular. However, we note that poor or small consumers connected to a network would usually pay comparatively less per unit than those who aren't, as they usually benefit from cross-subsidies. We note that varying service quality can be perceived as the provision of a different service.

A public phone booth can be regarded as a different service from a home telephone connection or as a different quality level of the same basic service, with limited flexibility. One important restriction is the limitations they impose on receiving incoming calls. This can be overcome through service innovations that make public phone booth services more akin to a household connection, however. In Bangladesh, for example, employees of phone booth service providers have to go and look for the person who receives an incoming call in the village. A more realistic solution in an urban environment might be what has been introduced in Brazil, where people who do not have permanent access to a telephone are given a voice mail number, which they can consult every time they have access to a telephone.¹⁹

¹⁹ ITU (1998).

3.2.3. How do alternative providers differentiate themselves on service quality?

When the poor do not have access to network supply from the main provider, alternative providers may sometimes abuse the situation to charge high prices for a low level of quality supplied, or competition between alternative providers themselves may drive prices down and hold quality to reasonable levels.

Sometimes, alternative providers have emerged on the back of service innovations, using low-cost technologies resulting in a lower price with a corresponding lower quality. In other cases, they offer more flexible customer services (in particular, more flexible payment methods and low or no connection charges).

For example, they might find cheaper ways of building a network, by using cheaper pipes of shorter lengths that are buried less deeply than conventional networks and installed and maintained with community labour. Examples include the provision of sanitation services in Pakistan (see below) or in Brazil, with condominial sewers, which require less extensive networks.

The Orangi Pilot Project (OPP) for sanitation services in Karachi (Pakistan) developed a technique for providing low-income households with in-house sanitary latrines, household sewers and connection to underground sewers in adjoining lanes and streets cheaply. This innovative system (with twin-pit pour-flush latrine) cost \$100 per household, instead of the \$1000 required for installing a sewer connection in the traditional way and was quickly extended to connect 600,000 people in the urban area of Karachi.²⁰

In Brazil, condominial sewers have been introduced in shanty towns as a way to provide lower-quality sewerage system at an affordable price. These sewers run through the backyards of households, instead of in the middle of the street. Sewers can be placed at a shallower level, and the length of sewer required to connect each household is reduced. Households receive lower quality service, because it is not a household connection. In addition, communal cooperation for maintenance of sewers is essential, because individual connections are no longer independent of each other.²¹

In other cases, they would use supply solutions that require no network of pipes or wires (local electricity generation, cellular phones).

Experience in Kenya with market-driven photovoltaic systems has resulted in more people getting their electricity this way than through the official rural electrification programme, constrained by limited resources. For low power loads, this solution is cheaper than other solutions, such as grid connections, isolated generators, kerosene or drycell batteries. In Nairobi (Kenya), eight private companies were selling solar panels, which have the added advantage of being adaptable to demand (a household can add more solar panels as its needs and capacity to pay increases). Supply can be

²⁰ Water Aid report, "Megaslums", available on <http://www.wateraid.org.uk/research/slums.html>.

²¹ From Vivien Foster, International Training Program on Utility Regulation & Strategy, University of Florida, 1998.

*irregular, as it depends on weather conditions but users tend to prefer the planned irregularity they're exposed to with solar panels, which enables them to manage available power more efficiently, to the erratic nature of power shortages or voltage drops characteristic of network supply. In addition this allows them to use more efficient lamps, which cannot be used when connected to the network because of the risk of voltage drops. One main disadvantage, however, is that this technical solution imposes restrictions on up-grading of electrical equipment, especially if electricity is used for small-scale production in cottage industry or irrigation.*²²

In other cases, the small private provider might offer more flexible payment conditions, with regular small payments, which make its service more attractive for the poorest segments of the population. This can be done by using smart cards that allow prepayment for water or power, pre-paid telephone cards or load limiters that keep electricity consumption to affordable levels.

*In the area of telecommunications, prepaid calling cards have been introduced for mobile cellular services. The user is assigned a number to receive calls, and can buy recharges to make calls. He does not have to pay for connection or rental charges but would typically pay a higher usage fee. Those who would not generally be able to afford or qualify for normal telephone services can do so, and this has proved a very attractive business for private operators. Prepayment eliminates the debt collection problem, and greatly reduces costs of customer services for the operators. Numerous operators have experienced rapid growth in subscribers and traffic following the introduction of such schemes. Some even introduced lower-cost prepayment schemes, with activation costs lowered by 80 per cent and usage costs by 40 per cent.*²³

3.2.4. How are alternative providers regulated?

The task of “regulating” alternative providers is a complex one: providers are numerous and diverse and they often operate in the informal sector. As a result, government officials have often been reluctant to regulate these sectors, hoping that they are only a temporary solution and will disappear as soon as the main utility provider reaches the neighbourhood.

Their attitude ranges from hostility (banning them, or granting an exclusive concession to the main operator) to neglect. Regulation is often limited to construction standards, through licensing requirements, and enforcement is often weak. Most aspects of price and quality are regulated through market forces, but this means that alternative providers can potentially be harmful for customers' safety and the environment. A policy of active encouragement is rare. Some attempts at self-regulation by providers are evident, possibly to enhance reputation, but possibly also as attempts to organize cartels.

²² Robert Van der Plas (1994).

²³ ITU (1998).

Governments' attitudes to alternative providers

In some cases, governments try to forbid alternative providers or to seriously restrict their activities on the grounds that they are more harmful than beneficial, due to external effects.

Informal urban transport providers are often accused of being responsible for a large share of pollution and congestion problems that plague Third World cities. Repeatedly, governments try to ban them in a vain attempt to put an end to the problem, and overlooking the fact that they provide an important service option for the poor. For example, the Indonesian government at one point took the view that cycle rickshaws were dangerous and created traffic congestion and decided to ban them altogether.

They are also accused of delivering sub-standard and dangerous products (such as dirty water, unsafe electrical wiring or dangerous transport), although evidence of inappropriate quality levels being delivered is difficult to find, which is unsurprising given the lack of regulation and consistent enforcement.

Informal urban transport is often less safe than formal transport, due to drivers competing for customers. For example, in Delhi (India), private buses constituted just 0.15% of registered vehicles in the city in 1995, but they were involved in 11% of accidents (or 3 collisions per day).²⁴

High prices are sometimes seen due to abuses of monopoly power and the formation of cartels. In other cases, high prices are due to the fact that operating restrictions raise production costs for alternative providers in the informal sector. Under the threat of expropriation, most suppliers would only invest in technologies with low capital costs, even if this involves high operating and maintenance costs.

A survey of willingness-to-pay for water from tanker trucks in the Kenyan city of Onitsha found that tanker trucks there seemed to be able to capture significant economic rents. ²⁵ The authors contrasted this situation with those in many other developing countries, where water vending seems to be a competitive industry in which prices are determined by market forces. They attributed these high prices to the fact that a large World Bank funded project for developing water supply had been announced (and repeatedly delayed) and had created uncertainty about future profitability of tanker truck vending, therefore limiting possibilities to make productivity-enhancing capital investments.

Exclusion of existing small providers also takes place when governments try to secure a dominant position for the main operator. Examples include concession arrangements with international private providers with exclusive provision arrangements.

²⁴ Cervero, Robert, "Informal Transport: Mobility Options for the Developing World", Prepared for United Nations Commission on Human Settlements (Habitat), Nairobi, Kenya, January 2000.

²⁵ See Whittington, Dale and Donald T. Lauria and Xinming Mu (1991).

The contract for the La Paz-El Alto water concession specifies that new water and sewer connections must always be in-house connections and gives an exclusivity agreement to the concessionaire, which results in the elimination of all communal standpipes, even though they are low-cost alternatives to in-house connections.²⁶ By contrast, in the Manila water and wastewater concession, such exclusivity rights were not granted to the concessionaires. Any licensed pre-existing private provider was allowed to remain in place, effectively operating in “pockets” within the service area, with the concessionaire able to compete to extend service to those areas if customers there are willing-to-pay the concessionaire's price. Also, for new developments within the concession area, the concessionaire can obtain a licence to supply the service only if it can do so at a cheaper price than any competing third-party supplier.²⁷ Non-piped suppliers are not specifically regulated (they do not hold a licence) but they are not banned either: Indeed, a large proportion of the population still receives water that way.

Self-regulation

Lack of regulation can limit the potential for markets developed by alternative providers.

In the example of photovoltaic electricity supply in Kenya mentioned above, the need to establish and apply quality standards appears to be crucial for the development of the market. According to observations, “Solar electric companies have been compromising technical standards to offset the increase in price after the recent devaluation of the Kenyan shilling. More frequent equipment failures may have long-term impact on the development of the market”.²⁸

Confronted with a lack of formal regulation and in search of the advantage of signalling quality, some small private providers have chosen self-regulation as a way to enhance their reputation and secure a consumer base. Industry associations have created labels, in order to create a reputation for good quality service.

In Benin, SIBEAU (a private firm which handles about 60 percent of latrine waste coming from the urban area of Cotonou) and ten other sludge collectors have formed an association which has standardised collection procedures and prices charged to consumers.

Route associations play a significant role in organising informal urban transport markets.²⁹ According to a UNDP report, they exist at all levels of private urban transport services in the developing world, and are formed to bring order and avoid inefficiencies and redundancies within a spatially defined service area. For example, they would prohibit members from stealing customers by running ahead of the pack, a practice known as “head-running” which is very common in the

²⁶ Komives, Kristin; Brook Cowen, Penelope J (1998).

²⁷ Concession Agreement (Service Area East) between Metropolitan Waterworks and Sewerage System and Manila Water Company Inc. (1997).

²⁸ Robert Van der Plas (1994).

²⁹ Cervero, Robert, idem.

developing world. They would levy a fee on their members in order to finance their activities, and hire field agents, to ensure orderly behaviour at pick-up points, along routes and at major traffic intersections. As income levels rise, route associations tend to be more formal. The most developed and organised ones are in Latin America and the Caribbean, such as in Puerto Rico, in Mexico City or in Buenos Aires.

Industry associations should not always be relied on, however, as they are often formed as an attempt to maintain high prices (although if the sector is truly competitive, this will not be effective in the long run) and they do not have appropriate incentives to overcome problems of negative externalities.

3.3. Issues Emerging from the Combination of Service Options

Services from alternative providers are often perceived by governments as a temporary solution, indeed a very short term one, to fill a temporary gap in supply. Governments tend to prefer network provision to decentralised low-cost solutions, for a number of reasons.

Building high quality networks may be cheaper in the long term than if the network is revisited several times at rising levels of quality. For electricity supply, the quality of the product supplied through a network remains potentially vastly superior than through solar panels or diesel generators. Economies of scale and scope attached to network supply mean that prices for network supplies are also likely to be cheaper in the long run.

According to a report published by ESMAP,³⁰ the costs of expanding the electricity network to rural areas can be significantly decreased through the use of low-cost options. This report found that the costs of labor and materials for three-phase line construction typically range between \$8,000 and \$10,000 per kilometer of line of which around 80% are materials. Practices such as using higher voltage, using higher quality poles to reduce life-cycle costs or properly sizing and placing transformers can lead to significant reductions in costs. With such practices, the study found that it was possible to cut network extension costs down to \$5,000/km for three-phase lines, and down to \$4,000/km for single-phase lines. Single-phase lines are often sufficient to carry the type of loads used in rural areas, and are more suited to productive uses than alternatives to network supply, such as PV or diesel generation. However, the study stresses that it is not necessarily efficient to save on initial development costs by using low-cost alternatives. “An initially inexpensive line that needs frequent maintenance, overhauling, and upgrading can require considerably greater investment during its lifespan than a line that has been adequately designed from the outset”.

But in some cases, and if given the chance, alternative providers can consolidate into network providers and provide healthy competition for the main provider.

There are approximately 400 “aguateros” in Paraguay, which are small private water suppliers operating their own wells and providing piped water to households in areas usually not served by the public operator. These providers evolved from being truckers a decade ago, and switched to pipe

³⁰ ESMAP, “Reducing the Cost of Grid Extension for Rural Electrification”, Report 227/00, February 2000.

supply because it was cheaper and more efficient. They are entirely privately financed and appear to be more efficient than public suppliers. Government agencies regularly test the water, and the aguatero can be shut down if its water fails the test. Aguateros compete with each other (“some streets have as many as five competitors”) and with the municipal water companies, which offer subsidised prices. Competition has kept prices down to approximately 1.4 times the official utility price. According to an observer, “many customers chose private suppliers over the cheaper municipally supplied water because, they say, service is more reliable and the water tastes better”.³¹

Given that public funds are usually not available to develop the entire network at once with the level of quality required for long-term investments, alternative providers must therefore co-exist with the main provider and be allowed to provide low-cost solutions at acceptable levels of quality.

The issue for regulation becomes one of transition between service levels: in the first instance, alternative providers should be allowed as providers of services which complement those provided by main providers. As possibilities for network provision increase, alternative providers can compete with the main provider for the supply of network services best suited to customers’ needs. Alternative providers should be allowed to evolve to avoid the risk that their customers are locked into a “poverty trap”.

One solution might be what is often adopted for main private operators: a gradual tightening in minimum service standards, with some incentives placed on alternative providers to enter the formal sector and up-grade their service in the long run. For example, this could be done through giving financing facilities to those alternative providers that want to up-scale their activities, on the condition that they would fulfil licensing or operating quality requirements.

Such an approach would treat alternative providers as a valid long-term solution to be considered in full alongside other options and to be taken into account when designing institutional structures and regulatory mechanisms for quality and price.

³¹ Tova Maria Solo (1998a) and (1998b).

4. SUMMARY AND RECOMMENDATIONS

On the basis of observations made during the course of this review, we recommend how quality issues should be approached in the context of infrastructure liberalization and privatization so as to tackle the interests of the poor. We contrast this approach with what is commonly adopted by developing countries' governments. Last, we highlight areas for future research.

4.1. Key Observations

Quality requirements are usually defined with centralized infrastructure provision in mind, on the basis of developed countries' standards. Such standards are usually above the minimum standards that would be acceptable for the poor, and that would be socially optimal. They are rarely set on the basis of affordability considerations, or analysis comparing costs and benefits of various quality standards.

We found that these high quality requirements limit access for the poor because they increase the price of service. Providers are reluctant to supply the poor unless subsidies are in place, because production costs are kept high and they need to maintain profitability. These requirements limit innovation in low-cost solutions and keep costs unjustifiably high.

Alternative providers offer diversified supply options to low-income customers. They often do so outside the formally regulated sector and quality regulation of their activities is either non-existent (often due to the lack of institutional capacity) or inadequate. They offer more accessible and flexible options to low-income customers, but quality of provision may fall below any reasonable minimum level, and threaten the health and safety of consumers, or generate excessive social costs (pollution, congestion, etc).

Current governments' approaches usually fail to consider the main utility provider and alternative providers alongside, as providing different price/quality of fundamentally the same service. Instead, they usually consider alternative suppliers as a temporary solution. There are good reasons for preferring network supply in the long run, as it tends to be cheaper and more efficient. But in some cases, alternative providers may consolidate (if they are given the chance of doing so) and compete with the main provider to drive down prices or improve quality.

One striking example of the above usually takes place when private participation is introduced into the network service. Governments often grant exclusivity to the private operator, with the view of limiting its perception of risk and preserving its profitability. De facto, this means banning alternative providers and seriously limiting service options for the poor.

With respect to quality regulation of the main provider, quality objectives are often set in an uniform and prescriptive way (input standards), thus limiting the private provider's scope for innovation in low-cost solutions in specific supply areas, or for reaching the same overall output quality using lower cost methods.

With low institutional capacity in many developing countries, and problems of co-ordination between regulatory agencies, enforcement of quality standards is often low (although, it tends to increase after privatization). In some instances, self-regulation has emerged as a way to regulate quality: this can take the form of providers' associations, or the development of brand names or quality certification. Governments seldom rely on this kind of mechanisms to reach a given quality outcome and the attention remains focused very much on the centralized definition of standards.

When a regulatory agency is set up (that usually goes hand in hand with the introduction of private participation), it often deals mostly with the main private operator, and has little knowledge of issues affecting alternative providers. This also contributes to the lack of regulation of alternative providers. Some forms of community-level regulation have also emerged but have remained relatively marginal (see companion paper to the Conference) .

4.2. A Recommended Approach to Quality Regulation

By contrast with the approach commonly observed (see above), we recommend an approach to quality which is much more tailored to actual local circumstances.

Legal framework

Regulatory intervention should only take place when a market failure has been identified. This will focus regulatory intervention better on aspects that create problems, and leave more flexibility to private operators in defining the level of quality they want to deliver on the basis of their competitive position for all other dimensions of quality.

Quality objectives should be defined on the basis of local circumstances, taking into account the costs and benefits of the target level of quality. This is to ensure that developing countries define the quality objectives they can afford, and effectively enforce these levels, instead of setting unachievable objectives at developed countries' levels that will not be met.

Existing quality requirements should be revised with a view to identifying whether a lower minimum requirement could be established, on the basis of what would be acceptable for the poorest segments of the population and what would allow fulfilment of social objectives, in terms of health, safety and the environment. This would reduce the costs of basic access and make access more affordable for the poor, without jeopardising quality beyond an acceptable level.

Providers would be allowed to compete on quality aspects above these minimum quality requirements, in order to meet the needs of other segments of the population, and of business customers in particular.

If minimum quality requirements still cost more to produce than the poor can afford, subsidy schemes should be designed in order to ensure that providers offer services to the poor without compromising their profitability, and that low-income people have access to.

Privatization of the main utility

When introducing private participation in the main utility provider, the whole sector structure should be assessed in order to identify the type of services which are, or could be provided by alternative providers and their price/quality characteristics. On this basis, governments would be in a better position to define which activities should be formally opened to competition, and which ones have natural monopoly characteristics. Exclusivity clauses in general should be avoided. This would avoid cutting service options for the poor in an arbitrary way.

When regulating service quality for the main provider (privatised or not), governments should allow the delivery of different quality levels to different customer groups, to be identified on objective criteria and enforced. This would help with the problem of under or over-supply of quality. This possibility should be explicitly allowed in the contract, so that penalties are not unduly paid for sub-standard quality. Flexible payment options should also be explicitly allowed, such as the capacity to phase the payment of the connection charge over a number of years.

Customers could be given the choice between different quality options and their associated price. If individual choice is difficult and costly to organise (for example, for service characteristics which are jointly consumed), ways of identifying group preferences should be defined (an area for future research).

Regulation of alternative providers

Quality objectives for alternative providers should be set on the basis of minimum standards, leaving them flexibility to meet the needs of the poor more adequately on aspects of service quality which do not call for specific regulation.

For natural monopoly activities in areas not reached by the main provider at the time of privatization, the government should consider granting Licenses to alternative providers in order to formalize their position (for example, independent power distributors in rural areas) and accelerate access by the poor to the service. The government could organize tendering processes for these licences, in which the main provider would formally have the right to participate. Governments should not allow Licenses to become a source of exclusivity, but should instead promote entry and competition, to ensure that licenses are not used to create and allocate rents between alternative providers.

Alternative providers should be allowed to evolve, through a gradual tightening in service standards, for example, with some incentives placed on alternative providers to enter the formal sector and upgrade their service in the long run.

Regulatory institutions

Regulatory agencies should be set up with the mandate to protect customers' interests, and to specifically ensure that the interests of the poor are met. Agencies will need specific expertise in low-cost solutions and community contact, especially for the regulation of alternative providers.

Regulatory institutions should be designed with a view to minimize regulatory costs (so as to lower the overall cost of service, and make it more affordable for the poor).

Regulatory instruments

The diffusion of information on the quality performance of all providers, could be a cheap and effective way of reducing the information asymmetry.

Quality signalling should be recognized as a substitute or complement to government intervention, especially when institutional capacity is weak and when keeping regulation costs low is important.

Output or outcome standards should be preferred to input standards, in order to leave maximum flexibility to the private operator to reach the given outcome. This will reduce production costs, and these cost savings can be passed onto consumers to reduce the price of the service, which will be beneficial to the poor.

The following table summarizes our main observations and recommended approach.

Table 2: Recommended approach vs. commonly adopted approach

Policy decision	Common Approach	Recommended Approach
Legal framework	Quality standards set on basis of developed countries (e.g. WHO drinking water quality guidelines)	Assess which quality aspects could be improved by regulation (market failures) and whether minimum standards can be defined, above which private providers can compete
Privatisation of main utility		
<i>Market structure</i>	Exclusivity granted to main operator for natural monopoly activities	Analyze current market structure and services by alternative providers
	Competition introduced for activities with no natural monopoly (electricity generation, telecommunications)	Formally allow competition in all areas - consider quality explicitly in the definition of rules for market entry
<i>Level of quality standards</i>	Uniform quality standard, limits access by the poor	Examine whether quality objectives and payment options can be differentiated by service area – If so, reflect in contract obligations
	Set on basis of developed countries' examples (relatively high level)	Set on basis of willingness-to-pay and costs of supply alternatives (including low-cost provision)
		Develop methods for identifying group preferences
Regulation of alternative providers	Mostly informal status	Realistic quality objectives, can be lower than main provider
	Neglect (no regulation) or, clamp-down and repression, if they cannot fulfil standard quality rules	Focus regulation on correcting market failures: information gathering and publication, output standards simple to monitor
Regulatory institutions	Regulatory agency is set up in parallel with privatization, mostly dealing with the main private operator	Set up agencies expert in regulating services for the poor (experience of low-cost alternatives, community contact for encouraging community level regulation)
		Design regulatory institutions with a view to minimise regulation costs
	Limited institutional capacity to enforce	Self-monitoring, publication of quality performance, community and NGO regulation, compensation schemes for consumers
Regulatory instruments	Input standards	Output or outcome standards: leave flexibility to private operators
	Little consideration of quality signalling by private providers	Quality signalling recognised as substitute or complement to government intervention, diffusion of information
	Poor enforcement	Tighten enforcement of minimum standards

4.3. Areas for Future Research

During our review, we found that policy design could benefit from further research in a number of areas, as follows.

Information on the cost of alternative service solutions and their impact on quality of service should be better shared, as innovative experiences are often confined to their area of origination. Collecting and publicizing information on the cost reductions achieved by alternative providers or through initiatives by main providers should be seen as a priority. This would inform the definition of minimum quality standards adapted to local circumstances.

In order to inform investment and market structure decisions, it would be extremely helpful to know more about alternative providers' costs relative to the prices they charge for their services (to know whether they do indeed extract monopoly rents) and the quality levels of their supply.

Estimates of willingness-to-pay for extended access and externalities from it should also be refined. It is often difficult to assess what customers are willing to pay for different service quality, either at the individual level or at the group level. Methods of revealing group preferences, either through willingness-to-pay studies or through direct community consultation, should be developed further.

Regulatory instruments for alternative providers should be investigated further. In particular, ways of making alternative providers pay for the external costs that their activity imposes should be investigated, and best practice examples gathered in that area. The cost-effectiveness of quality regulation should itself be investigated further, in order to take account of the full costs of regulatory alternatives when defining the appropriate institutional framework.

The results of such research should help in designing sensible regulatory solutions. Such solutions should aim to keep service costs broadly in line with willingness-to-pay (adjusted for externalities) and to avoid requesting too much in the way of quality improvement, as this would have the undesirable effect of pushing those who cannot afford the network (or formal) service back into the black market.

APPENDIX A. INSTRUMENTS FOR QUALITY REGULATION

In this Appendix we deal in more detail with specific instruments for quality regulation, and the design of regulatory institutions.

A.1. Quality Standards Applied to Private Sector Operators

Contracts between a public entity supervising the sector and private providers typically include performance standards and quality objectives as well as price-control rules.

Contracts might include input standards, specifying amounts of investment, or the type of inputs that need to enter the production process. This type of standard is usually specified when it is difficult to measure desired quality outputs. For example, fuel inputs of certain purity can be specified to reduce emissions of sulphur dioxide by electricity generators. Or it is possible to specify the annual amount to be spent on asset maintenance in order to consider sustaining service quality. However, input standards are increasingly discarded on the grounds that they can be wasteful if not directed towards appropriate investments and they may stifle innovation.

An alternative is the specification of output standards. They consist of defining particular quality levels that firms are required to achieve. For example, a regulator may require that a certain percentage of telephone calls placed by consumers are completed, or that gas supplied to consumers should be of a certain calorific value with a maximum level of impurities. It could also specify the quality or type of connections to be provided.

In the urban transport sector, input standards (such as vehicle specifications, operations and maintenance guidelines, driver ability and fitness) are the instruments most commonly used for regulating quality. In the former Soviet Union, for example, daily medical check-ups are required for drivers. These are not rigorous, so the costs of providing such service increase without improving service quality. An alternative approach, based on output standards, would be to make the manager responsible for accidents, and to strictly enforce penalties against employees in the event of fault, such as firing or suspending them, or cancelling their driving licence.

The definition of outcome standards is a third alternative. Outcome standards involve the specification of a desired outcome, without designing any particular compliance mechanism. For example, a system of tradable property rights in pollution sets a cap on total pollution in an area. Firms for which pollution abatement is relatively cheap can trade their rights to pollute to those for whom it is relatively expensive. Firms for whom abatement costs are lowest can produce the greatest reductions in pollution. For a given quality target, market-based mechanisms, such as tradable property rights or “Pigouvian” taxes on undesirable outputs, are likely to impose the least compliance costs on businesses, since they allow firms to choose their compliance methodology. But such mechanisms may be costly to verify or administer, or may simply be inapplicable to particular types of quality targets.

A.2. Institutions for Quality Regulation of Private Sector Participants

A.2.1. Defining quality standards

Defining quality standards is often a political decision, reflecting society's preferences for customer service or for the environment. As a general matter, accountability will be improved if there is clear separation of policy, regulatory and operational roles regarding quality. This is appropriate for major and high-level aspects of quality.

It is important to ensure that relevant cost and willingness-to-pay information are fed into the decision process. The regulator should assist this process with information and perhaps by organising consultation. When the decision is taken at a political level, however, it is rare (especially in developing countries) that the assessment of costs and benefits from regulation is explicitly taken into account when defining the standard.

If the decision rests with the regulator, it is more likely that the price/quality trade-off will be taken into consideration. The danger is that the regulator can easily stray into making policy decisions, and the objectives and incentives provided to the regulator will become doubly important.

Ofwat, the regulator of water and sewerage services in England and Wales, made specific reference to affordability of services when setting the target level for improvement in service levels for companies at the price review in 1994. As it put it: "For many companies the Director concluded that there is neither a pressing need for the scale of improvement in service levels proposed nor sufficient evidence of collective customer support to justify any allowance in price limits. In a number of cases, affordability has been the critical issue because of the high level of existing bills".³²

Some decisions on standards are very technical and require specific skills, which are not necessarily held by the sector Ministry or by the economic regulator. This is likely to be the case for (say) the regulation of drinking water quality or the carbon-content of fuel to be used by providers of private transport facilities. In this case, a dedicated regulatory group attached to the most relevant Ministry or agency will be required. International standards may be adopted (such as the WHO guidelines for water quality) as they are, to reduce reliance on local expertise, but this clearly introduces the risk of setting standards at developed countries' levels rather than at levels achievable by lower-cost alternatives.

Another question to address is the level of government at which regulation should be defined. To make regulations more reflective of the local trade-off between quality and cost, it is preferable to set them at the level of government that is closest to the operating level providing the service. However, municipalities might be more easily captured by local providers, and there is a risk that the approach to quality will then be non-optimal. On the other hand, a central regulatory system (at the level of the Ministry) is more suited to deal with one main utility provider.

³² Ofwat (1994), "Future Charges for Water and Sewerage Services, The outcome of the Periodic Review", July 1994.

Other dedicated agencies can play a role in bringing detailed knowledge to the regulatory process, such as agencies specialised in financing or assisting the delivery services in rural areas.

A.2.2. Monitoring and enforcing standards

Monitoring and enforcing quality requires a dedicated apparatus, more or less large according to the selected enforcement methods (see below).

The introduction of private sector participation in the electricity or gas sectors is sometimes done in parallel with the setting-up of regulatory agencies, charged with protecting customers' interests by monitoring quality and dealing with customers' complaints. Such regulatory agencies must have the enabling powers to collect information from providers, to perform random quality checks and to apply penalties if required.

In sectors which have traditionally been the realm of local governments, the regulatory framework is often less clear. This is the case for water and sanitation, waste collection and urban transport. In this case, local governments might be in charge of monitoring quality but they will often lack capacity to fulfil these tasks. In some cases, local governments have even been made directly legally responsible for service quality faults, which raises their incentives to perform this task well (this is the case in the water sector in France, for example). Even for those sectors, the setting up of a centralised regulatory agency might be preferable, as it would allow the sharing of technical expertise and monitoring equipment.

However, centralizing monitoring and enforcement of quality requirements might not be appropriate if those requirements vary substantially from one service area to the next depending on local circumstances. In those cases, communities might be better suited for monitoring service provision, especially through assisting customers in formulating their complaints, the organisation of customer service committees and the diffusion of information. This process of enabling local representation should be encouraged.³³

Where institutional capacity is weak, community organizations and NGOs, including dedicated consumer organizations, have a role to play in monitoring performance, distributing information and providing pressure for improvement. However, as such organizations are easily captured by political or other interests, maintaining balance in their role is an ongoing challenge.

In our view, the courts have a role as a place where consumers can raise complaints against providers for inappropriate quality. The threat of a court case can be assimilated as an enforcement institution, although as previously mentioned, it is unlikely to be very effective for the poor in developing countries.

³³ A separate paper for this Conference deals with community initiatives in regulating the delivery of infrastructure services by private sector operators. Smith, Warrick (2000), forthcoming.

A.3. Types of Legal Instruments

Quality targets for private provision can be set through a variety of legal instruments. The choice of instrument depends on the frequency with which the standard will need to be changed and the number of parties involved in agreeing changes to the standard, among other things.

Health, security and environmental requirements have a significant impact on the mortality and morbidity, and on the utility's costs (such as the regulation of drinking water quality standards, or the quality of sewage discharges) should preferably have foundations in primary legislation. The process for modifying laws is usually more complex and difficult than for secondary legislation or bilateral contracts. If consumers and third parties see laws protecting their interests, they will be more likely to accept the private participation as legitimate. If the utility is satisfied that these rules are not going to be modified over-night and that it would be duly consulted in the process for modifying them, this can contribute to lower its perception of risk and ultimately the cost of service through a lower cost of capital. As a result, in order to limit all parties' perceptions of risk, it is preferable to pass laws that have a significant bearing on the utility's operating environment prior to the privatisation rather than after.

For those durable standards where the government wants to retain some flexibility, regulations (founded in laws), that can be more easily amended to an extent by the regulatory agency, might be more appropriate.

Less fundamental aspects of quality, which may need to be changed at regular intervals (for instance, when pricing conditions are reviewed) are better expressed in contractual clauses (for example, customer service standards, such as the delays for responding an enquiry by mail or by phone). The tariff arrangements should always be modified in parallel with any modification of quality objectives. In this case, it is better to set out quality rules during the privatization process, with clear rules for revising them when tariff conditions are reset.

A.4. Enforcement Methods

Enforcement methods will have a very significant bearing on the quality outcome: there is little point in setting high quality requirements if the organisation in charge of regulating quality cannot or does not enforce them. Different methods have different costs, according to who is in charge of monitoring quality, and how frequently this needs to be done.

If there is a sufficient degree of confidence in the private operator, it might be preferable to make the operator indirectly responsible for monitoring performance versus quality targets. This might be a useful way of reducing monitoring costs, especially in areas where monitoring requires a close involvement in the daily operations of the network.

In the water sector, multi-part sampling can be used: for example, the utility would, in set places at set times, take three samples of water to be checked, would test one and send the results to the drinking water quality regulator, and would also send two other samples to the regulator. The latter

can perform random checks on the received samples and compare them to the utility's results, to assess their reliability. The third sample is held against the need to use it in dispute resolution.

The contract between SENELEC (electricity utility) and the Senegalese government specifies that the company must publish an annual report on quality and spontaneously calculate the penalties (or "incitations contractuelles") that it owes for breaking quality standards and calculate the corresponding discounts for its customers.

If confidence is low, the regulator may choose to monitor directly (either through random, or through constant checks) but this will increase its costs.

Penalties may be paid either to the regulatory body or to a specific entity. They can either be paid each time a service standard is breached, or on the basis of a general indicator of quality performance. It might be unnecessarily costly to require that the company pay a fee or penalty for each quality requirement that it fails to comply with. Instead, utility regulators (for the water or the rail sectors in England and Wales, for example) have developed systems for tracking various quality components in a combined manner through a weighted-average index of quality indicators. This index is then used for adjusting prices at reviews, on the premise that providers with a comparatively poor quality of service should be penalised through lower price caps.

An attractive variant of a civil liability regime for monitoring and enforcing the quality of customer service is to give customers the right to claim compensation when the utility provider has failed to comply with the standard. This method is applicable only to certain service characteristics, for which information is perfectly shared but where market power might lead to an unsatisfactory outcome. For example, companies would need to pay a specified amount of money if they had not answered a customer claim within the specified time. However, this might be difficult to establish in developing countries as it can lead to a "penalty market", with customers making false claims in order to obtain a payment.

Another way of giving customers compensation for poor quality is to give them discounts over the normal price for the service.

In the Buenos Aires water concession, customers who receive water at a pressure below the contractual commitments receive a "low pressure" discount. However, the granting of such a discount is based on the company's own knowledge of the network characteristics, not on customers having to prove the sub-standard level of service provision.

APPENDIX B. REFERENCES

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