

**Infrastructure development:  
The roles of the public and private sectors**

*World Bank Group's approach to supporting  
investments in infrastructure*

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## Executive Summary

This note describes the World Bank Group's approach to supporting investment in infrastructure.<sup>1</sup> The objective is to provide assistance on the specific issue of whether infrastructure should be financed and/or managed by the public sector alone or by involving the private sector in some fashion. The note cautions against one-size-fits-all recommendations. Rather the aim is to indicate how an appropriate solution can be found based on economic reasoning and an assessment of country-specific circumstances. The note complements the sectoral guidance notes prepared as part of the Infrastructure Action Plan.<sup>2</sup>

From its inception through the 1980s, the World Bank's strategy was to finance public infrastructure so long as the investment had a sufficient economic rate of return. This approach generated valuable projects, but led to little institutional reform or reduction of inefficiencies. Thus, during the 1990s, the Bank group became more reluctant to lend to governments for infrastructure, and more willing to support private investment. But getting private participation in infrastructure (PPI) to work well has also proven technically difficult—and politically contentious. As it has become clear that improving infrastructure services is difficult whether provision is public or private, the Bank Group has become more open to supporting public as well as private projects.

The Bank Group's objective is to reduce poverty. In the infrastructure industries this is most frequently achieved by delivering increased growth, although different forms of infrastructure can have more direct linkages to poverty reduction. But this objective does not determine whether to rely on a public or private provider, or some combination of the two. More directly, attempts to improve infrastructure services are usually assessed on four criteria: (i) *access* to the service; (ii) *quality* of the service; (iii) *affordability* of the service; and, to avoid disruptive cycles in service delivery, (iv) *financial sustainability* of the service. While there are arguments about which of public or private operators will better achieve these objectives, in the end these criteria provide little firm guidance.

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<sup>1</sup> This document was prepared by the Infrastructure Economics and Finance Department of the World Bank. An IEF team including Michael Warlters, Timothy Irwin, and Ellis J. Juan prepared an initial draft, with contributions from John Nellis as an external advisor to the project. The final version was prepared with the benefit of comments from Aijaz Ahmad, Doug Andrew, Paul Amos, Aldo Baietti, Pierre Guislain, Jonathan Halpern, Clive Harris, Jan Janssens, Michel Kerf, Michael Klein, Luiz Maurer, Yogita Mumssen, Maryvonne Plessis-Fraissard, Jamal Saghir, Gary Stuggins, Bernard Tenenbaum, and Jonathan Walters.

<sup>2</sup> The Infrastructure Action Plan and sectoral guidance notes on electricity, water, transport, ICT and gas can be found on the Bank's [Infrastructure Website](#) under [Business and Strategy](#).

So reformers and task managers must look towards a set of factors that influence the relative performance of public and private operators (see Box 1). The practical starting point is classification of each relevant sub-sector by the degree of competition present. There is strong evidence that private firms operating in a competitive market perform better than public monopolies. Where competition is economically possible, it should be pursued as the central objective of policy reform. However, recent experience has demonstrated that the complexity of establishing the conditions in which competition can work may justify lending to public operators while the supportive environment is constructed.

Project managers need to balance the importance and urgency of current investment needs against the time and effort that will be needed to put in place an effective form of PPI. If the government is a long way from successfully attracting private participation, investment in a public project should be considered. At the same time, purely public project should aim at addressing the major constraints to private participation. In the long run, the aim should be to encourage the private sector to assume a greater proportion of total infrastructure investment. For reasons of limited fiscal space and intense competition for alternative uses of public funds many governments already seek private sector investment but find themselves unable to enlist private sector financing because of inadequate investment climates and regulatory environments.

Where many elements of a sound environment for private participation appear to be in place, but investors' concerns about risk hamper investments, there is a role for Bank Group risk mitigation instruments. Alternatively, or in addition, less risky options of PPI can be pursued. For example, a lease involves much less private investment than a concession. A flat-fee management contract involves very little commercial risk for a private operator (but also provides weak incentives to the private operator to improve performance). Management contracts with performance bonuses, or with an option to take an equity position at the end of the contract, have also been employed.

A government's choice, for affordability or other reasons, to subsidize services need not influence the choice between public and private service providers. In general prices below cost are a deterrent to private investor interest. But this is largely a question of how subsidies are delivered. Some countries have attracted private operators to enter market segments with a bidding criterion of least subsidy required. Output-based aid schemes provide a new possibility for the delivery of subsidies on a least cost basis, rewarding private partners when desired outputs have been achieved.

The infrastructure sector most likely to remain substantially in public hands is *water and sewerage*. Here the core problem is financial sustainability. As private investor interest in this sector has waned in the last few years, the Bank Group

has been sought to help fill the gap. It will be involved in providing investment funds to publicly owned systems for a considerable period. Bank Group projects should aim to install management arrangements that create the strongest possible incentives to improve access, quality, and affordability, while maintaining financial sustainability. They should also improve the regulatory environment so that over time even stronger incentives can be put in place. Ownership of assets would generally rest with the public sector.

Where competitive *energy* markets can be established (that is, markets are sufficiently large to support multiple operators), they should be pursued as the ultimate reform goal. In some countries, however, that goal may be far into the future. The farther the system is from full competition, the more attention should be paid to shorter-term reforms that lay the foundation for a competitive energy market; in particular taking steps to ensure that the distribution sub-sector is financially solvent. Where competition cannot be achieved in the very short term, then operations can be maintained in the public sector at least until any necessary unbundling has occurred. In many instances, the time-frame for moving to fully competitive markets is so long that partial or limited competition reforms, such as competitive bids for procurement of new energy, may be considered.

Strong competition in *telecommunications* is possible. Competition enhancement and PPI are the goals of World Bank Group strategy in this sector. There is a presumption against lending to public sector operators in absence of a strong rationale. The emphasis is on helping the country to build the appropriate regulatory environment to encourage competition and to restrain residual market power of the incumbent (especially in relation to network access).

Public investment is the norm for *roads*, but there are opportunities for private participation in projects such as major highways, bridges and tunnels, and multi-year road maintenance contracts. Well-planned road investments generally generate high social returns, and so should receive Bank Group support, whether the roads are to be managed by public or private operators. In *rail*, the Bank Group is likely to support private participation in profitable (predominantly) freight lines. If the business is not profitable, there is usually little reason for public funds to be spent. For larger *ports* the model usually favored by the Bank Group is that of a public corporatized and commercially run "landlord" port with private provision of port related services. The Bank Group supports private involvement in *airport* investment. One case where public investment may be warranted is small regional airports, where governments may decide it is in the public interest to facilitate inter-regional transport.

**Box 1: A Checklist of Issues**

Improving the performance of infrastructure firms is difficult whether they are publicly or privately managed. There are no general cures for poor performance. Rather a careful diagnosis of the firm's failings, as well as the potential for different sorts of reform in the relevant country's institutional environment is required. The following issues should be considered when thinking about whether to involve the private sector in the financing and/or management of a currently public infrastructure firm:

- World Bank Group funding support for firms that have historically performed poorly on financial and welfare criteria will not be available, unless the government presents a clear strategy for improving performance.
- When the Bank Group lends to a wholly public infrastructure project, accompanying steps should be taken to improve the policy environment, such as separation of operations from policy and regulatory functions, improving cost recovery (where appropriate), and establishing incentives at managerial level for enhanced performance.
- In competitive markets, preference should be given to private sector solutions. Where feasible, taking account of market size, economies of scope and scale, and transaction costs, unbundling of markets should occur to permit competition in sub-sectors.
- In countries with weaker institutional environments, regulatory rules for natural monopolies should be as simple as possible. Considerable effort should be given to preparing clear rules for the initial transaction documents and for the supporting regulatory environment. Weakness of the institutional environment may reduce the set of potentially sustainable forms of private participation.
- Limited fiscal resources can provide motivation for governments to seek private financing. This usually requires cost-covering tariffs, and so requires a careful assessment of affordability implications. A clear statement of government policy on subsidies including its funding sources is highly desirable, regardless of whether services are publicly or privately managed.
- Weakness of investor interest can usually be attributed to financial and/or political risks. Political risks can be reduced through guarantees, or better, institutional reforms.
- When investment is urgent (e.g. after a disaster) the choice between public and private sectors is driven by which sector has the greater readiness of capacity.

## 1 Introduction

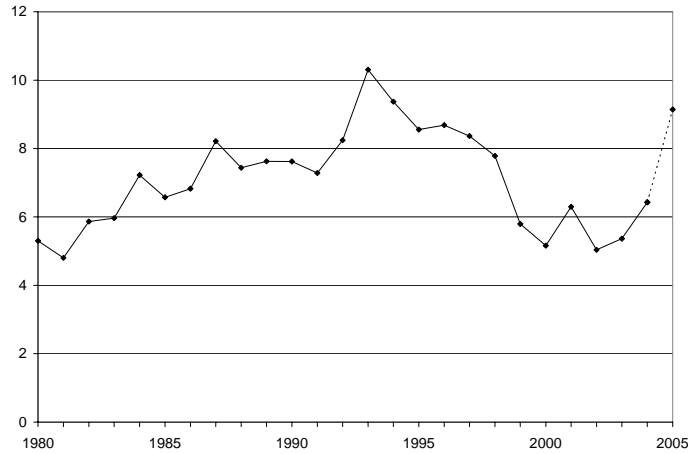
1. The Infrastructure Action Plan sets out a series of measures to revitalize the World Bank Group's infrastructure business. As part of this plan, five sets of guidance notes on public-private sector roles in the various areas of infrastructure were prepared, dealing with electricity, water, transport, information and communications technology, and gas. The sectoral notes are designed to provide guidance to World Bank Group staff and clients on assessing the suitability of available options for public-private roles in the different infrastructure sectors.

2. The purpose of this note is to complement the sectoral guidance notes with cross-sectoral guidance on the specific issue of whether infrastructure should be financed and/or managed by the public sector alone or by involving the private sector in some fashion. It is assumed that the reader is familiar with the different roles and responsibilities for financing and management under different forms of PPI: management contracts, leases, concessions, and divestiture. The note cautions against one-size-fits-all recommendations, recognizing the variations in context across the Bank's client countries. Rather the aim is to indicate how an appropriate solution can be found based on economic reasoning and an assessment of institutional arrangements in individual countries.

3. The rest of this introduction provides a brief history of shifts in the World Bank's approach to the public/private choice in infrastructure. This note seeks to clarify the Bank's current approach in the light of these shifts. Section 2 examines intermediate objectives of infrastructure reform—access, quality, affordability, and financial stability—and how public or private sector solutions might differ in their impact on these outcomes. Of course the ultimate objective is to improve the well-being of consumers. Section 3 examines a set of factors that may alter the impact of public or private sector solutions. These factors are thus likely to be critical in choosing between different ownership structures. Section 4 then discusses general conclusions for sectoral policies, conclusions which may need to be adapted for particular countries in light of the factors in section 3.

4. In the years following the World Bank's creation, Bank financing of investments in electricity and transport infrastructure initially made up more than 60 percent of its portfolio. The relative importance of infrastructure lending declined in the 1970s, but the Bank's approach continued to reflect the dominance of governments in the provision of infrastructure. Bank strategy was to offer to finance public infrastructure so long as the investment had a sufficient economic rate of return.

5. Though there were successes, the results on the whole were disappointing. Political pressures consistently led to low prices, while corruption, patronage,

**Figure 1: Bank Group Infrastructure Commitments (US\$ billion)**

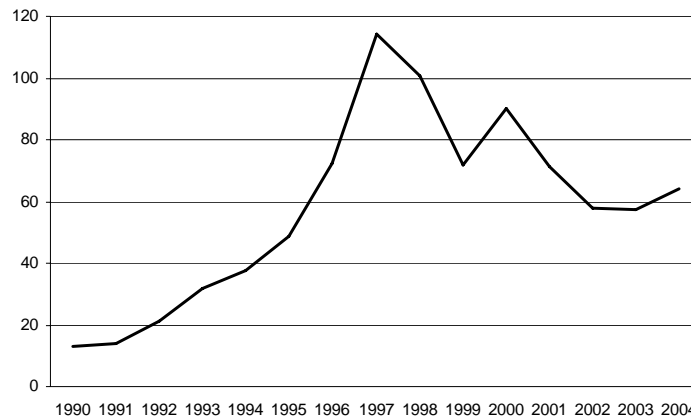
Source: World Bank records. Data for FY05 are planned investments.  
 Figures are in nominal dollars.

and overstaffing inflated costs. Most public providers were financially distressed and lacked the resources to meet demands for expanding access. Following years of unsatisfactory effort to improve the performance of public providers, and increasing concerns about their fiscal cost, governments and donors turned their attention to private provision. During the 1990s, the Bank Group also changed its strategy, becoming more reluctant to lend to governments for infrastructure (see Figure 1), and more willing to offer support, both intellectual and financial, for private investment.

6. Various arguments were given in favor of private sector involvement. One such argument was that arm's length relationships between public authorities and service providers would facilitate cost recovery and effective regulation. Traditional public service providers frequently combined functions of legislation, regulation, service provision, audit and reporting, resulting in non-transparent objectives and results. Another argument was that, by choosing from multiple private operators, there was a greater chance of finding a more efficient operator.

7. Investment in infrastructure projects with private sector involvement expanded greatly in the 1990s, reaching a peak of US\$ 114 billion in 1997 (calculated in nominal prices, see Figure 2). Even after falling from that peak, it remains much higher than in the 1980s or the beginning of the 1990s. It constitutes about 22 percent of total infrastructure investment in developing



**Figure 2: PPI commitments in developing countries (US\$ billion)**

Source: PPI database. Figures reported at nominal prices.

countries,<sup>3</sup> and about ten times as much as Bank Group investment. Out of the overall private investments in infrastructure during the 1990-2004 period, the *telecom sector* represents the lion's share standing for close to 50% of the total amount<sup>4</sup>. The other half is represented by investments in the energy, transport and water and sanitation sectors.

8. While private participation has had its successes, getting it to work well has proven difficult. Political pressures to keep tariffs low have remained, leading to costly disputes with private provider seeking higher profits. While access has increased, those disputes have often caused rates of increase to slow. Corruption and inefficiency remain issues of concern for the public. In addition to such concerns, private investors have become more wary of the risks of investing in developing countries. It has become clear that improving infrastructure services

<sup>3</sup> The 2005 Global Monitoring Report estimates that actual investment in infrastructure in developing countries constitutes about 3.5 percent of developing country GDP, implying total investment of around US\$ 286 billion in all developing countries in 2044. \$64 billion of PPI investment in 2004 constitutes roughly 22 percent of this sum. Note that the PPI database includes government funds invested in projects with private participation, and reflects contractual commitments not actual disbursements. Accordingly, purely private investment in infrastructure is likely to be less than 22 percent of infrastructure investment.

<sup>4</sup> Share on private investments flowing to the telecom sector has been increasing during the last years. During 2004, the telecom sector accounted for 70% of private investments in infrastructure.

is hard, whether provision is public or private. Moreover infrastructure solutions need to be tailored to countries' stages of development (e.g., middle income, transition, post conflict, failed states, etc.).

9. The fundamental problem is that many infrastructure businesses are monopolies, or contain monopolistic elements. This reduces the provider's incentives to keep costs down and to seize profitable opportunities to invest. It also gives customers reason to suspect they are being overcharged. The more essential the infrastructure service, the stronger the pressure on governments not to raise prices. Under public provision, the result is usually poor cost recovery. Under private provision, cost recovery may be higher, but disputes and discontent are likely.

10. As the difficulties with private as well as public provision have become evident, Bank lending for public infrastructure has once again increased. But ongoing concerns about public provision and limits on many governments' ability to borrow mean that consideration continues to be given to private and "public-private" solutions. The approach is pragmatic and solution-oriented, requiring country officials and Bank group task managers to weigh carefully the pros and cons of different approaches.

## **2 Reform Objectives**

11. The aim of infrastructure reform is to improve the well-being of consumers, either by directly providing them with services, or by spurring economic growth which improves their living standards. The key performance indicators are the extent of *access* to the service; the *quality* of the service; the *affordability* of the service; and, to avoid disruptive cycles in service delivery, the *financial sustainability* of the service.

12. The decision to rely on a public or private provider, or some combination of the two, should be based on how the different regimes or tactics available will affect overall sectoral performance according to these criteria. As discussed below, the objectives most likely to be affected by the ownership choice are affordability and financial sustainability.

### **2.1 Access**

13. Expanded access has long been a focus of infrastructure reform, but it has gained prominence as the Bank has increased its emphasis on poverty reduction. The expansion of coverage benefits disproportionately the lower income strata, since they are, typically, those lacking service. The problem is typically most acute in rural areas, since these areas are more expensive to serve (lower

population concentration reduces the economies of scale of network service provision). But access problems also exist in urban areas, and will increase with urbanization.

14. In principle, there should be little difference between public and private solutions; both the public or private provider should be able to deliver a specified number of new connections. Competitive bidding among private providers might lead to lower costs of network expansion—but if increasing access involves a large capital outlay, private investor interest may diminish, or require expensive incentives.

15. In the presence of funding, and with good governance and oversight, public firms are likely meet commitments to improve access. But if funds are not available, neither the public operator nor the supervising government bears any financial cost for failure to meet the targets. For private sector firms, in contrast, contracts can specify access expansion targets backed up by penalties in the case of non-achievement. However, this requires that governments possess the capacity to negotiate, monitor, and enforce the contracts, and private investors may argue that they are unable to meet contracted targets for reasons outside their control.

16. So: Theoretical arguments about access are not conclusive. The ultimate test of a reform is the counterfactual: What would have happened in the absence of private participation? Evidence is just starting to be generated on this matter: In Argentina about 30 percent of municipalities, covering about 60 percent of the population, have privatized their water systems. Controlling for other differences between these two groups, researchers have assessed the outcomes attributable to the change of ownership. Comparison reveals that the introduction of private operators is associated with a 5-7 percent fall in child mortality, with higher reductions in the poorest areas. This reduction in death rates in the privately-served locales is associated with a decline in water borne diseases, such as cholera, suggesting that it was caused by greater access to clean water.<sup>5</sup>

## 2.2 Quality

17. Access is a simple notion; one either has the service or one does not. Infrastructure quality is more complex, involving technical, reliability, safety, and convenience calculations. Again in theory, there is no particular reason why

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<sup>5</sup> S. Galiani, P. Gertler, & E. Schargrotsky, 'Water for Life: The Impact of Privatization of Water Services on Child Mortality,'

public and private operators should not be equally likely to meet desired quality standards; quality performance should be simply a question of project design.

18. Project designers must, of course, bear in mind the effect of quality on cost and affordability. If quality standards are set too high, the resulting high costs may not be affordable by the local customers, and hence there may be little investor interest. A classic example is public taps (standpipes) instead of water piped directly into the house. Public taps are much less convenient, but also much cheaper per household served.

19. Both publicly and privately operated utilities can run into quality problems. In the case of public utilities a common cause is dependence on uncertain budget transfers, which may result in inadequate maintenance or failure to upgrade facilities. In the case of private firms, it may occur because stronger cost-cutting incentives compromise quality standards. The objective of achieving a specific quality is unlikely to be determinative in the choice between public and private solutions. The possibility of inadequate quality underlines the need to specify the required quality standards, followed by inspection and enforcement of standards, regardless of ownership as well as identifying the funding sources required for such tasks (end-users, tax-payers or a combination of both).

### **2.3 Affordability**

20. The lower the prices faced by consumers, the more they consume and the greater the benefits they obtain from that consumption. The "affordability" objective means keeping prices low, both for residential consumers and for businesses. But at the same time, the objective of financial sustainability suggests the desirability of cost-covering prices. Frequently governments seek to satisfy both objectives simultaneously, setting low prices even though costs are high. Financial sustainability could then only be achieved using subsidies, but this in turn brings further complications. Excluding subsidies, affordability can be achieved by lowering costs and/or through regulation that ensures as low a margin between prices and costs as is possible consistent with financial sustainability. In practice financial sustainability often entails increases in prices.

21. On the issue of lowering *costs*, private firms tend to perform better empirically than public firms. Different forms of private participation target different elements of performance. For example, a lease (affermage) contract gives the private operator the incentives to improve operations, including revenue collection, but weak incentives to improve the capital investment program. A concession is better suited to improving investment efficiency. The choice of type of private participation should in part be driven by the major sources of enterprise inefficiency.

22. On the issue of keeping *prices* low, private firms in competitive markets typically have an operating margin that is just sufficient to cover costs, including a reasonable return on capital. But in monopoly markets, which are the norm for most infrastructure services, private firms typically have incentives to set high, monopoly prices. The potential for private monopolies to keep prices to a minimum is determined by the strength of the regulatory system.

23. When regulation is used to determine prices, price structures can be used to adapt affordability to consumer circumstances. For example, a higher proportion of fixed costs can be attributed to richer consumers, to reduce the price paid by poorer consumers. The effectiveness of such regulatory schemes often depends on the extent to which service consumption and income are positively correlated. How prices are adjusted over time can also affect the efficiency of the utility (i.e., lower costs), by changing the firms' incentives.

24. When prices for retail infrastructure services are set by governments or their appointed regulators, differences in affordability of services offered by public or private firms are attributable to the nature of government intervention. The weaker the regulatory environment, the more private firms may be able to manipulate their reported costs to inflate prices. Alternatively, a weak regulator may be vulnerable to pressures to lower prices at the expense of the regulated firm. As discussed in section 3.2, task managers should consider the sort of regulatory environment likely to be encountered, in order to assess the likely effects of staying public or going with a private investor.

25. Turning to the possibility of subsidies, these may be used to address the case where cost-covering prices are not affordable by poor consumers. In this context, affordability is a normative concept, in which governments typically consider some price level as a proportion of income to be socially just. Many governments have decided, on social equity grounds, to set prices—for at least some users—below cost. This may threaten the financial sustainability of the provider. One way to resolve the dilemma is by setting aside specific subsidy funds to cover the “affordability gap”. Unfortunately, subsidies are frequently combined with poorly designed tariff structures so that the rich profit even more than the poor, and all consume excessively. Prices set below cost also tend to diminish private investor interest, and so are more typically seen in purely public settings. Subsidies are discussed in more detail in section 3.7.

## **2.4 Financial Stability**

26. The basic recipe for financial stability is to have cost-covering tariffs. The alternative of budgetary transfers to cover the difference between costs and prices, tends to be relatively volatile, and exposes utilities to additional financial risks. If the Government can accept cost-covering tariffs, both public and private

firms should be able to operate on a stable financial basis (subject only to external shocks, such as currency devaluations, that are likely to have similar effects on public and private firms).

27. If cost-covering tariffs can be achieved, involving the private sector can help to lock them in: private sector firms can be relied on to resist declines in the real price of services. An advantage of private sector involvement in infrastructure is a stronger incentive to recover costs. Consequently, private sector operators tend to bill and collect more diligently, thereby rendering it more likely that costs will indeed be covered.

28. On the other hand, private sector solutions are vulnerable when affordability constraints cause governments to reconsider cost-covering tariffs. Governments have strong political incentives to cut prices, especially when the private sector has already sunk investments. So, although the presence of private firms may strengthen commitments to cost-covering tariffs, the commitment remains brittle.

29. Moreover, there are some sub-sectors where cost-recovery is not realistic. For example, few developing countries impose direct fees for road use, particularly for rural roads (see Box 2). Here one must ensure a credible source of public funds. A road-fund, dedicating a specified portion of taxes on petrol or vehicle registration to road maintenance, is one example that seems to have had some success. Further discussion of subsidies is in section 3.7.

**Box 2: Road Pricing**

Road tolls may be imposed to pay for road construction and maintenance, or as a means of limiting congestion at particular times. However, in practice road tolls have not been used much because of political resistance to the idea of paying for road access, collecting tolls slows traffic (this argument is weakening as technology advances), and the transaction costs of collecting tolls (low traffic levels may not justify the salary of collection staff). Consequently, tolls tend only to be imposed for heavily used road sections that offer a speed advantage to customers, but for which there is a free alternative available.

Given scarce fiscal resources, and the importance of roads for economic performance, governments have an interest in involving the private sector in financing road construction. Although the private sector's profits are usually generated by some form of charges to users, the private sector can also be attracted by "shadow tolls." Where shadow tolls are used, users do not pay directly; rather the government pays the private operator a sum per road user or availability payments conditional on the road's meeting performance specifications. This methodology can be used to push construction- and market-risk onto the private sector; but it loses the advantage of user payments as a means of rationing use of the road to those who value it most, and it requires a secure source of funds for the shadow tolls.

**3 Factors Influencing the Public/Private Choice**

30. The previous section suggested few clear reasons to distinguish between public or private solutions in seeking to achieve the objectives of infrastructure reform. In this section a range of factors are considered which may render particular sorts of solution more or less favorable. Decision-makers should consider the options in the light of these factors.

**3.1 Competition vs. Monopoly**

31. In competitive markets private firms are likely to demonstrate performance superior to public firms. In non-competitive markets, the overall effectiveness of private firms is dependent on the effectiveness of regulation. In this context, market definition is important. Market structure reform entails the separation of competitive sub-sectors from remaining natural monopoly sub-sectors.

32. Competition is the strongest force for ongoing improvement in business performance. In some infrastructure areas such as telecommunications or electricity generation, competition may occur "within the market;" i.e., where

there are multiple firms that compete with each other to gain market share. Competition within the market provides firms with incentives to lower their prices, improve service quality and expand their client base. The conditions necessary for competition in the market to occur are discussed in Box 3. One conclusion that may be drawn from this discussion is that “competition in the market” is less likely in small isolated markets.

33. Alternatively, competition “for the market” can be used where multiple firms are not feasible; i.e., where the sub-sector is a natural monopoly. Examples include distribution networks in water, gas or electricity. In these areas, governments may auction the right to serve the market. When the auction is carefully designed and executed, the winning firm should be the most efficient bidder. A problem with competition for the market is that the pressure it applies is not constant. It is in force at the time of the auction, but as the competitive moment recedes into the past the benefits of the initial contest decrease. At the end of a 30 year concession period, there is no guarantee that the incumbent is still the most efficient firm in the industry.

34. Competition requires the possibility that firms can fail and disappear; this is more easily tolerated in markets where there are multiple private providers of the good or service. In sub-sectors where competition is possible, it should be introduced and protected, and preference given to the private sector. This is now generally the case in telecommunications, where technological advances have made almost all parts of the sector subject to competitive forces.



### **Box 3: Minimum Efficient Scale and the Scope for Competition**

Whether competition in the market is possible depends on the nature of industry technology and on market size. Technology determines how many units must be produced before the firm reaches the minimum possible average cost per unit ("minimum efficient scale," or MES). When price is set equal to this minimal average cost, consumers will demand a certain quantity. If this quantity is much greater than the minimum efficient scale, then there is room for multiple operators in the market. Competition then takes place. If the demanded quantity is less than the minimum efficient scale, the market will only support a single operator: The result is natural monopoly.

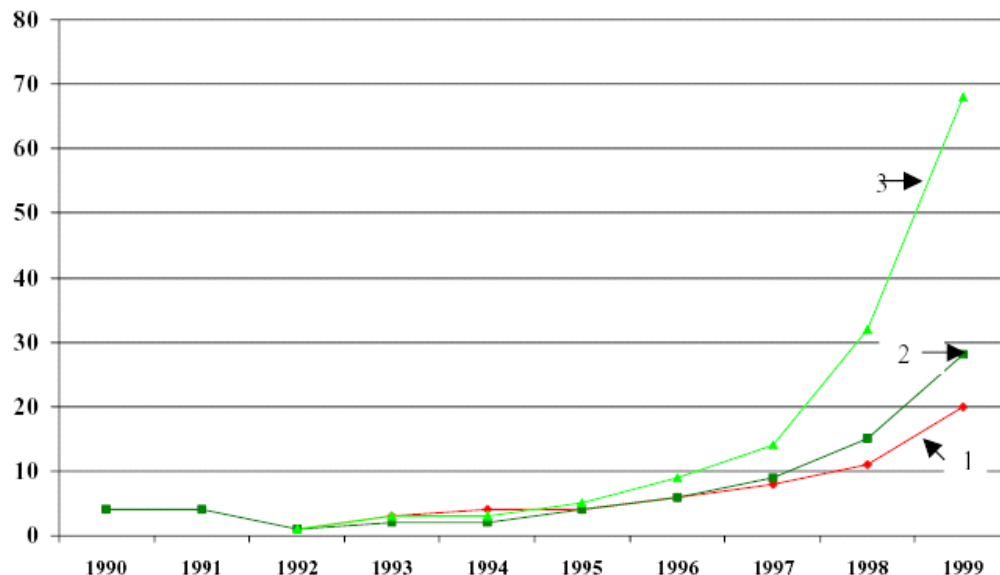
The electricity generation industry provides an illustration of how the potential for competition depends on the relative levels of demand and the MES. For example, the minimum efficient scale of typical electricity generating plants has shrunk from around 1000 MW to 100 MW over the last twenty years. This technological change allows the entry of multiple firms in countries with large demand for electricity; e.g., the United Kingdom with installed capacity of 77,000 MW, Australia with installed capacity of 45,000 MW and Argentina with 27,000 MW. In contrast there are very few sub-Saharan African countries that have installed capacity greater than 1,000 MW. It would be difficult to introduce workable levels of competition in these markets, given the presence of existing large power stations and complications introduced by large hydro-electric schemes. Experience in the United Kingdom suggests that four principal competitors is probably less than is required to avoid some forms of collusion in the market.

Even if competition in generation is possible it is not always the highest priority. Power experts often advise the reform of the distribution/supply sector before generation, to ensure that adequate revenues are collected to pay for all the industry's costs.

35. The more intense the competition, the more rapidly improvements in access are observed. For example, Figure 3 shows the performance of African countries that had either one, two or three mobile operators during the 1990s

36. Empirical evidence concerning the effects of competition *for* the market is mixed; the argument for privatization is weaker in natural monopoly sub-sectors. It may be that the benefits of introducing competition in long-term contracts are muted by the difficulties of running an efficient auction, or because of the complexity and persistence of regulatory problems. Governments not capable of running public sector utilities efficiently often find that organizing auctions and regulation poses an equal or even greater challenge, with resulting poor performance from privatized firms. The contrast between competition in the market and competition *for* the market can be illustrated in a comparison between the telecoms and water industries (Box 4).

**Figure 3: Mobile Subscribers as a Percentage of Mainline Subscribers  
One, Two and Three Mobile Operators**



37. In thinking about competition issues, it is important to consider sub-sectors. Competition may be introduced in some sub-sectors, while others remain monopolies. In thinking about monopoly, it is important to distinguish legal monopolies from natural monopolies. Legal monopolies extinguish the possibility of competition even where it could develop. For example a legal monopoly on the provision of electricity would extinguish the possibility of small-scale providers operating in rural villages. The rationale for legal monopolies is usually very weak.

### 3.2 Institutional Strength in the Country

38. The public/private choice that is the central topic of this paper is naturally affected by the institutional environment. This environment includes general factors such as the enforcement of property rights, respect for contracts, corruption and other matters of investment climate; the unbundling of rules design (legislation), rules enforcement (regulation), service provision, and auditing; and transaction design including market structure reform and design of the regulatory/contractual environment.

39. Of course, the institutional environment differs greatly from country to country, generally improving in quality with per capita income, suggesting, *a priori*, that private participation may be better suited to middle income countries than low income countries. But public infrastructure firms also typically perform

#### **Box 4: Why do the water and mobile telecoms sectors perform differently?**

Around the world there is a striking contrast between the performance of mobile telecoms firms and water utilities. Mobile phone firms are usually private, they make adequate returns for investors, they tend to have better quality regulators, and there are no particular difficulties in obtaining consumer payment. In developing countries, water utilities are typically public, they struggle to set tariffs above costs, and even then face difficulties ensuring payment; maintenance and new investment are often problematic for lack of funds, competent regulators are rarely established, and consumer resistance to tariff increases is at times dramatic and sometimes violent.

Reasons for this difference include the technologies of the two industries, and differences in consumer expectations. Mobile phone markets support competition. A new entrant can quickly establish the same marginal costs per call as an incumbent, fixed costs are relatively small compared to a wire-line network, and a greater proportion of the fixed costs is not sunk (antennae can be dismantled and re-sold). Thus entry and exit from the market are relatively easy. With competition, any attempt by an incumbent to reap monopoly rents attracts a new entrant who can cut the price. There is thus no need for government intervention in prices. Without government regulation of prices, the market sets the price including a reasonable return on capital. This in turn ensures the financial health of the industry. WTO entry requires the separation of regulatory and operational functions, and regulators tend to be well-resourced because of the industry's financial health. Consumers do not resist paying a return on capital, because their historical alternative has been no service at all. Further, different payment options allow them to manage the cost of the service.

In contrast, water distribution utilities are natural monopolies. This increases the risk of the misuse of market power, and so governments tend to regulate prices. For socio-political reasons governments tend to set price below cost, immediately ensuring poor financial health for the utility. For the same reasons, governments are also reluctant to give power to independent regulators. Because of the poor financial health of the water sector, water regulators, if established, tend to be under-resourced. The political sensitivity of water prices arises from its necessity for life, a widespread belief that water is "god-given" and so should be free, a history of under-pricing of water, the availability of alternatives (albeit lower quality water sources) and an argument that because of health externalities water should be priced at less than cost.

poorly in low income countries with poor governance. So it is not so clear that private sector solutions in these countries are worse than public sector solutions.

40. The answer to these considerations is not to wave one's hands in despair for low income countries. Rather, in countries with poor governance, reforms should be kept simple, whether public or private firms are used. Where the government of a country with poor governance wishes to attempt to introduce private participation, these considerations will frequently mean that only management contracts or leases should be considered. It should be noted, however, that it is

rare in practice for governments that have had positive experiences with management contracts to use the experience to develop deeper forms of private participation. Where concessions are attempted it is imperative that regulatory arrangements be as clear and as simple as possible.

41. In countries with weak governance, pricing rules and regulatory systems in general should keep discretion to a minimum. The price paid for this policy is lower flexibility to deal with unforeseen circumstances and hence greater likelihood of disputes and renegotiations. In turn this suggests either that contracts with private operators should have shorter duration than would be the case with stronger governance or that additional efforts will be needed to prepare dispute resolution mechanisms and capacity.

42. Reformers considering a PPI approach must be aware of the need for first-class advice to governments concerning transaction design and design of the regulatory/contractual environment. First-class advisers to assist in these processes are not luxuries. A little extra spent at the design stage can avoid a lot of legal and financial troubles later.

43. Moreover, effective private transactions depend on effective regulation, requiring an early investment in regulatory capacity. Even when purely public solutions are adopted it is worthwhile investing in regulatory capacity, to encourage governments to set prices on economic and financial criteria rather than political criteria.

### **3.3 Investor Interest: A Set of Trade-offs**

44. Investor interest is driven by financial returns and their predictability. The greater the uncertainty of achieving a reasonable level of financial return, the lower the interest of private investors. At some point, investor interest will vanish entirely.

45. Private firms raise money for investment either by borrowing or from shareholders' equity, or more typically, a combination. The firm must earn a return, the weighted average cost of capital, which is sufficient to compensate finance sources for the risks they bear. In order to achieve the required returns, potential private investors need to be reasonably confident that prices will be set, for the life of the project, sufficiently above the costs incurred. Of course, there is always some risk that the project will fail (e.g. demand less than forecast; or government reneges on the level of prices; or external shocks affecting the cost of capital or inputs, etc.). The greater the risk of adverse events occurring, the higher the rate of return firms demand to compensate for the risk. The higher the rate of return required, the higher the final cost of the service. If the implied price is not judged as affordable, the project is unlikely to succeed.

46. Regulation introduces a range of additional risks mostly having to do with government's behavior. For example, even after the signing of a privatization contract, there can be great uncertainty about the future level of prices, because of the pressures on government to set price below cost.

47. A major goal of regulation is to lessen this uncertainty, while leaving the government with some flexibility to adapt infrastructure prices to unforeseen contingencies. In general there is a trade-off between uncertainty/flexibility and the ability to deal with unforeseen contingencies, with more uncertainty leading to higher rates of return required by the private sector. To address investors' concerns, it is helpful if the government has a track record of cost-covering tariffs, and there is a functioning regulator with a history of reasonable pricing decisions. If these are absent, a second-best solution is cost-covering tariffs imposed prior to privatization. This shows government's good faith, and should lessen public attribution of the blame for price increases to the private operator. Risks for private investors can also be muted by reducing areas of discretion in the regulatory system. Risk mitigation products, such as partial risk guarantees offered by international financial institutions, can also assist in the allocation of project risks reducing as a result investors' risks<sup>6</sup>.

48. A complementary approach to attracting private sector interest is public subsidy. The revenues or management of the infrastructure enterprise can be auctioned to the private operator who demands the least subsidy.

### **3.4 Diversifying Sources of Finance**

49. Infrastructure investment can play a significant role in boosting growth, as evidenced by high social rates of return found for infrastructure projects. Consequently, many governments would like to increase their spending on infrastructure investment. However, governments in developing economies have limited "fiscal space" for infrastructure investment, with infrastructure facing stiff competition from alternative uses of public funds (e.g., current expenditure, social infrastructure, debt repayment, etc.). Accordingly, many governments seek to diversify the sources of infrastructure financing.

50. Taxpayers or consumers, current or future, are the ultimate financing sources for all infrastructure (apart from the concessionary component of foreign aid). Investments of public infrastructure firms have traditionally been financed from the public budget (current taxpayers), possibly with some contribution from

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<sup>6</sup> Partial credit guarantees cover specific obligations of a government to a private project, ensuring payment in the event of default on a private debt resulting from the nonperformance of such obligations.

those firms' retained earnings (current consumers). Tax revenue is limited in the short term, and is subject to many competing demands, including from sectors in which there are no alternative financing sources. Increasing taxation is politically difficult, and higher taxes generally mean increasing distortions in the economy, with greater welfare cost for each dollar of revenue raised.<sup>7</sup>

51. One alternative is to increase government borrowing, imposing additional future taxation in order to repay the debt. This option is limited by prudent macro-economic policy concerning debt levels (or in some countries by agreements with the IMF). Moreover, public borrowing may be repaid using future tax revenue, so that additional public borrowing also imposes increasing distortions on the economy.

52. So there are natural limits to the funding provided by current and future taxpayers. Additional funding can be sought from consumers. In order for this to occur, prices must be set higher than just covering operations and maintenance costs. There are various possible arguments concerning the social justice of imposing costs on current consumers in order to invest in expanding access to new consumers. On the one hand it may seem unfair that new consumers should benefit from old consumers' payments. On the other, existing consumers (those with long-standing connections) tend to be richer than newly connected consumers. Independently of new connections, in a growing economy future consumers will tend to be richer than current consumers, and so funding by future consumers is often preferable to funding by current consumers.

53. Funding by future consumers occurs when the infrastructure firm borrows money, to be repaid from future revenue. Public infrastructure firms may do this by issuing bonds, or borrowing directly from commercial banks. Private firms may additionally have access to equity injections. These sources of finance depend on the confidence of lenders that sufficient future revenues will be earned to repay the debt. They are only available to well-managed infrastructure firms.

54. Diversifying finances means accepting the principle of tariffs that cover operating and maintenance costs, plus a reasonable return on capital invested. For governments with poorly managed infrastructure firms, it may also mean bringing in new private management in an attempt to signal that future revenues

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<sup>7</sup> Widely quoted estimates of the marginal cost of an additional dollar of tax revenue in the United States are of the order of 30 cents. Estimates for developing countries are of similar magnitude. This means that public spending requires a social rate of return of at least 30 percent for the combined tax and spend operation to increase welfare. Such high rates open the door for private financing. Suppose the private sector found a project to be privately profitable with a cost of capital of 15 percent. If the social rate of return of the project were 20 percent, welfare would be reduced if it were financed from public funds, but increased if it were privately financed.

will be enhanced. But among forms of private participation only concessions, BOTs and divestitures bring significant amounts of private investment. These are precisely the forms of private participation that have proved in practice the most difficult to implement. In order to encourage private investment notwithstanding weak institutional environments, governments sometimes provide guarantees that lessen the private sectors risk exposure. Governments need to account for the risks inherent in these guarantees.

55. Expanding the sources of financing for infrastructure can sometimes lead to a virtuous circle in which investment plans are brought forward, leading to higher growth, more rapid poverty alleviation and enhanced taxation revenues. Higher tax revenue in turn enables even more financing for infrastructure.

### **3.5 Encouraging the Private Sector**

56. Private participation, among other initiatives, can contribute to general developmental goals such as encouragement of an entrepreneurial culture, particularly relevant in countries with socialist traditions. More specifically, private participation can assist in the development of capital markets. More developed capital markets facilitate local savings and investment, and also provide a potential source of discipline on management through the threat of takeover, and the public information demands of listing requirements on stock exchanges. Privatized firms usually account for a large proportion of market capitalization in countries that have vigorously pursued privatization programs. While these matters can be touted as benefits of private participation, they would rarely serve as sufficient motivation to undertake PPI transactions.

### **3.6 Urgency**

57. Natural disasters, conflicts, or civil war can also affect the choice between public or private sector infrastructure solutions. For example, where the local public utility has adequate technical capacity, but physical capital has been destroyed by a natural disaster, donors may decide that providing the public firm with capital to replace destroyed physical stock is the most rapid and efficient means of restoring services. On the other hand, post-conflict countries are likely to lack necessary technical capacities. Here, it may make sense to utilize an international operator to re-establish services (and perhaps train or re-train the local cadres). For example, East Timor has employed a Macao company under a three-year management contract to run its electricity company.

58. The immensity of the Millennium Development Goals provides another example of urgency. It is clear that the task is too large for the private sector alone, given current levels of private investor interest in infrastructure. This has

led some donors to be more open to public sector solutions than they were in recent years.

### 3.7 Subsidy Needs

59. Governments may decide not to pursue full cost-recovery in some sectors, either because full-cost is judged not to be affordable for at least some deserving group of consumers; because the service provided yields public good spillovers (for example, clean water and sanitation yield public health benefits in addition to their private consumption benefits); or because the imposition of direct user fees is infeasible (e.g. rural roads). In such cases a subsidy will be required. Governments must recognize when they are in these situations and plan an appropriate subsidy strategy.

60. The decision to provide subsidies need not, however, determine the choice between public and private operators. Generally setting prices below cost is a deterrent to private participation. But subsidies can be designed so as to be consistent with private participation. Chile, for example, made great progress in expanding telephone services in rural areas inviting private operators to serve particular areas with a bid criterion of least subsidy.

61. This is not the appropriate forum for a full discussion of subsidy design, other than to note that governments should answer five questions when preparing a subsidy strategy:<sup>8</sup> Are subsidies well targeted, generally flowing to the poor with little leakage to the relatively wealthy? Are the costs clear and measurable? Are the administrative costs as low as possible? Is the revenue to pay for the subsidy raised from the source that entails the least cost to the economy? Is there an alternative subsidy mechanism that could perform even better?

62. Answering the five questions helps reduce the costs of this second-best option. If the subsidy requirements are not too large and revenues are collected from a substantial percentage of consumers, cross-subsidies from one group to another group of consumers (e.g. rich to poor; or domestic to business, or vice-versa) may be used, to equilibrate total costs and total revenues. Cross-subsidies are an issue of tariff design, and can be equally implemented for public or private projects. When subsidy needs are greater than total revenue collections, recourse must be had to taxpayer funds.

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<sup>8</sup> For more on subsidy design see Estache A., Foster V., and Wodon Q., *Accounting for Poverty in Infrastructure Reform: Learning from Latin America's Experience* (2002); and additional documents at <http://rru.worldbank.org/PapersLinks/Pro-Poor-Private-Infrastructure/>



63. The main problem in the use of taxpayer funds are cycles in a government's fiscal position. Historically, many governments in crisis have tended to sacrifice the funding of maintenance or new investment in infrastructure, since there are few immediate losers. The more persistent the cycles, the lower the levels of maintenance and capital expenditure in infrastructure, and thus, the greater the ultimate decline in service quality and even quantity. Once a government establishes a pattern of this sort, its commitments to provide subsidies, to either a private or a public operator, lose their credibility. Such lack of credibility will reduce or eliminate private investor interest.

64. To break the negative pattern and restore credibility, governments must establish a record of protecting infrastructure maintenance and investment budgets. A comprehensive budget review process with strictly enforced decisions would be the ideal way to balance infrastructure needs against the spending needs of other sectors, but this seems a challenge for many governments. A less ambitious alternative is to limit the discretion of the budget review process and " earmark " certain funds for a specific set of tasks. This is the method used for road funds, for example, which fix in law a proportion of petrol taxes and vehicle registration fees for use on the upkeep of road networks.

65. Donors can assist governments in establishing a track record of providing subsidies as promised. A recent innovation is that of performance based subsidies, delivered only after some desired, specified output has been achieved (Output Based Aid Schemes)<sup>9</sup>. When used to encourage private sector participation or to improve performance of state-owned utilities, donors could provide the relevant subsidy funds (or guarantee delivery by the government of those funds) in order to expand and enhance service delivery to poorer communities.<sup>10</sup>

#### **4 The Bank Group's Approach to Infrastructure Development**

66. The choice between investment in public projects or providing support for private projects is guided by the general principles discussed in section 3, and a variety of more detailed factors discussed here in section 4.

67. The starting point is classification of the relevant sub-sector by the degree of competition present, or that could be introduced with relative ease. If strong competition in the market exists then the matter is substantially resolved: Where

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<sup>9</sup> Brook, P., and T. Irwin (2003), *Infrastructure for Poor People*, World Bank.

<sup>10</sup> In January 2003, The Global Partnership for Output Based Aid (GPOBA) was established by the UK Department for International Development (DFID) and the World Bank. Its purpose is to fund, demonstrate and document output based aid approaches to support the sustainable delivery of basic services to those least able to afford them.

competition is economically possible, it should be pursued as the central objective of policy reform. However, in many client countries of the Bank, simply lifting legal barriers to entry may not be sufficient to create a market; additional actions might be required.<sup>11</sup> The complexity of establishing the conditions in which competition can work may justify lending to public operators while the supportive environment is constructed.

68. In natural monopolies, the second best pressure that can be brought to bear is through competition for the market: auctioning of the right to serve the market. A reasonable reading of the literature is that PPI of this form can deliver strong benefits, but only if done well: It has to be based on fair, transparent bidding, designed to select the most efficient operator; tariffs (or possibly secure subsidies) should be set to achieve cost recovery; the contract needs to specify procedures for tariff adjustment, quality standards and access targets; dispute resolution mechanisms need to be established in advance; and regulation needs to be performed by qualified staff, based on technical criteria, independently of operator, public and government pressures. In addition to endangering prospects for success, failure to put all of these in place also reduces investor interest. The reformers' dilemma is this: the factors that make governments poor operators of state-owned infrastructure firms also make it hard to create the conditions for successful PPI.

69. It is in natural monopolies, then, that the greatest difficulties are posed for Bank Group infrastructure strategy and practice. The project leader needs to balance the importance and urgency of current investment needs against the time and effort that will be needed to put in place an effective form of PPI. If the government is a long way from successfully attracting private participation, investment in a public project may be considered. At the same time, any purely public project should aim at addressing at least the major constraints to private participation. In the long run, the aim should be to encourage the private sector to assume a greater proportion of total infrastructure investment.

70. Where many elements of a sound environment for private participation appear to be in place, but there is still no investor interest, there may be a role for Bank Group risk mitigation products (i.e., political risk insurance, partial risk guarantees, partial credit guarantees, etc.). Alternatively, or in addition, less risky options of PPI can be pursued. For example, a lease involves a smaller amount of

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<sup>11</sup> Two examples: (1) There is a role for regulatory intervention to ensure adequate frequency availability and to resolve interconnection disputes when new mobile phone operators enter the market and seek access to incumbent operators' networks. (2) Competition between electricity generators is sometimes possible, when the market is sufficiently large. But creation of a generation market requires a complex system of trading and dispatch rules and reliable purchasers of electricity.

private investment than a concession. A flat-fee management contract involves very little commercial risk for a private operator (but also provides weak incentives to the private operator to improve performance). Management contracts with performance bonuses, or with an option to take an equity position at the end of the contract, have also been employed. If there is still no investor interest, then one can consider a wholly public project.

71. When the Bank Group lends to a wholly public infrastructure project, accompanying steps should be taken to improve the policy environment, such as:

- Commercialization or corporatization of the firm;
- Placing managers on performance contracts that link compensation to improving levels of billings, collection, fault rates, cost of service, technical loss levels, etc. (or if the company can't even produce accounts and performance data for the moment, to do so).
- Developing technical capacity for tariff determination, including basic auditing skills to verify costs and economic skills to aid in the setting of prices. This capacity should be developed in an institution that is separate from the regulated entity, and ideally from political influence. The practicality of this latter ideal will vary across countries. Even for a public sector firm, it makes sense to have prices determined on technical criteria, rather than political criteria; or by the firm itself. Chile subjected its publicly owned and operated infrastructure firms to independent regulation long before it opted for privatization; when the firms were eventually divested, the regulatory systems were in place and functioning well.
- Tariff reform, to move towards cost-recovery. There may be a role for output-based aid schemes to assist in the transition period.<sup>12</sup>
- Establishment of secure sources of funding to address sectors where cost-recovery will not or cannot be achieved (e.g., rural roads).
- Development of policies specifying where, when, how, and for whom subsidies are to be used – including where the funds will come from.
- Enhancement of the investment climate, particularly in respect of contract enforcement. For example, measures to encourage bill payment would improve utility performance.

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<sup>12</sup> For example, a Bank loan was used to finance the transition to cost-covering water tariffs in Guinea.

72. The Bank Group prefers to lend for utilities and other infrastructure firms that have historically performed well on financial and consumer welfare criteria. Still, poor financial performance is often the reason why the Bank Group is approached. When the Bank Group invests in a poorly performing firm it needs to see a clear strategy for how financial performance will be turned around.

73. The following sections apply the principles set out above, showing briefly how they vary in emphasis in differing sectors. The emphasis here is on the public-private choice. In projects involving private participation there will often be a role for IFC lending, MIGA political risk insurance or Bank guarantees. But that matter arises *after* the decision as to whether the project is to be wholly public, or to involve private participation in some form. These sectoral notes are not intended to be complete statements of sectoral policy. For more complete guidance the reader should consult the sectoral guidance notes.

#### 4.1 Water and Sanitation

74. At present the vast majority of the world's water distribution and sanitation networks are publicly owned and operated. This will continue to be the case for many years to come. The experimentation of the last 15 years introduced various forms of private participation in water and sewerage, but the frequent (not inevitable) result was popular protests, dissatisfied governments and unhappy investors. In light of this experience, a number of private operators have signaled their intention to withdraw from the field, or to participate only in forms which expose them to lesser risks (e.g. management contracts or leases, rather than concessions). As private investor interest recedes, the Bank Group is called upon to fill the gap. It will be involved (or re-involved) in providing investment funds to publicly owned systems for a considerable period.

75. Regardless of whether the utility is publicly or privately managed, the core sectoral problem is financial sustainability.<sup>13</sup> Sometimes the problem is one of transition: people are able to pay more than they currently do, but social resistance will be encountered if the transition is too rapid. Governments feel they will expend too much political capital by trying to raise rates. In such cases, subsidies may only be required for a transitional period to temper the political reaction, and allow time to demonstrate the benefits of an improved system.

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<sup>13</sup> Water is the area where governments most frequently choose to set prices below cost, in the name of affordability. The judgment can be questioned; often, for example, it is the poorest segments of society who pay the highest unit prices to receive water from vendors; the low prices benefit the relatively few, and comparatively affluent, who are connected to the formal system. And it is the lack of revenue that prevents the water utility from expanding its network into poor neighborhoods. Holding water prices down in the name of the poor rarely benefits the poor.

76. Of course sovereign governments have the right to set tariffs at rates they choose, whether for equity or any other reason, including that of retaining political power. But where tariffs are below cost, it is highly desirable that the government has a clear position on how the gap between price and cost will be covered, and a subsidies policy specifying clearly the intended beneficiaries and how the subsidy will be delivered and financed. The country should also be encouraged to establish a technically competent pricing regulator, to attempt to separate or at least distance the pricing decision from daily politics.

77. Whether the water distribution utility should rest fully within public management, or should be given over to some form of private management—or to some mix of the two forms—can only be decided on a case-by-case basis, looking at the principal deficiencies of the current system and the capacity of the existing regulatory environment, and based on a reasoned estimate of what sort of reforms, if any, can rapidly and effectively take place. In all cases, Bank Group projects should aim to install management arrangements that create the strongest possible incentives to improve access, quality and affordability, whilst maintaining financial sustainability. They should also improve the regulatory environment so that over time even stronger incentives can be put in place. Ownership of assets would generally rest with the public sector.

78. One area where private sector investment is often feasible is water treatment plants. These operate at the wholesale level, so their viability depends on the financial sustainability of the downstream distribution utility or on the sustainability of government payments for contracted water.

79. Although water and sanitation systems are often operated by the same company, the two systems have quite different economic characteristics. In particular, sewerage and waste water treatment systems yield large public benefits, helping to protect the community from communicable diseases. There is a much smaller element of public benefit in the provision of water services. Consumers are less willing to pay for sanitation services than is publicly optimal, providing a rationale for greater public involvement in financing sanitation than water services. Even if the private sector can be involved in the financing and/or management of water services, there may be a role for ongoing public subsidies for the provision of sanitation services.

## **4.2 Energy**

80. Where competitive energy markets can be established (that is, markets are sufficiently large to support multiple operators), they should be pursued as the ultimate reform goal. In some countries, however, that goal may be far into the future. A common barrier to achieving sustainable competition in generation is the presence of distribution systems that are not financially sustainable because

insufficient retail revenue is generated to pay for bulk power, transmission and distribution costs.

81. In many instances, the time-frame for moving to fully competitive markets is so long that partial or limited competition reforms may be considered. These include: allowing open access to networks by third parties, and trading on a bilateral basis between generators and distributors and other suppliers.

82. In generation, private financing of new plants is preferred. If there is little private interest because the sector produces inadequate revenue to cover costs and incremental generation, then there should be doubts about additional public investment too. Any system expansion would only exacerbate fiscal drain; in these instances, policies to reduce losses and revenue leakages in distribution are preferable to assistance for generation investment. Least cost expansion plans should also consider demand side measures such as energy conservation, energy efficiency and demand management. If the Bank Group does decide to invest in public generation projects they should be consistent with an up-to-date, least-cost expansion plan, the major financial problems should be addressed to ensure the sector is on a sustainable financial footing, and the investment should be a priority given scarce public resources.

83. Transmission is an important avenue for public sector investment lending by the Bank. Transmission can also be handed over to private management. A number of countries have contracted to have sections of the network constructed on a BOT/BOOT basis, and such possibilities should be presented to and discussed with borrowing clients. Except for cases of extending transmission systems to new markets, investments in expansion of the transmission network should desirably be based on the cost of congestion at various points on the network. Bank support for public or public/private transmission investments should be contingent on client commitment to overall reforms, including the attraction of private capital in generation and distribution.

84. In distribution/supply, financial sustainability is the highest priority, as the interface with the customer determines the level of liquidity for all service providers in the sector. Measures to ensure financial sustainability include full metering, "correct" tariff systems, enforcement of bill payment, and treatment of electricity theft as a crime. In most cases, some form of private participation is desirable, in order to "lock-in" the reforms: private investors can be relied upon to oppose future policy changes that undermine financial sustainability. Bank Group instruments should be packaged with sector reforms to leverage private sector investment and expand access. Though some form of PPI in this sub-sector is normally advantageous, well-performing and financially sustainable, fully state-owned distribution companies can be considered for Bank Group lending.

### **4.3 Telecommunications**

85. Considerable experience, from all regions and from countries at every income level, show that strong competition in telecommunications is possible. Competition enhancement and PPI are the goals of World Bank Group strategy in this sector. There is a presumption against lending to public operators. Rather the emphasis is on helping the country to build the appropriate regulatory environment to encourage competition and to restrain residual market power of the incumbent (especially in relation to network access).

86. There remains, however, a role for public-private partnerships such as output-based aid interventions to extend access to information infrastructure on a competitive basis. And the Bank Group can also assist in preparing remaining state-owned enterprises for sale.

### **4.4 Transport**

#### ***Roads***

87. Public investment is the norm for roads. Nevertheless there are opportunities for private participation in projects such as major highways, bridges and tunnels, and multi-year road maintenance contracts. Well-planned road investments generally generate high social returns, and so should receive Bank Group support, whether the roads are to be managed by public or private operators. Nevertheless, the Bank Group should leverage its involvement to ensure that arrangements for ongoing maintenance are a condition of financial support.

#### ***Railways***

88. Most of the increase in private participation in rail infrastructure in the last 15 years or so has been in freight rail. The basic reason is that freight transport is less politically charged, and more capable of independent financial viability (even with strong road competition) than passenger rail transport. Governments do not have strong incentives to deny adequate returns to private freight operators. The Bank Group encourages private sector participation in rail freight operations that are or can be made profitable

89. Most passenger railways are publicly-owned and require budgetary support at least for infrastructure and in many cases for train operations as well. Arguments such as avoidance of road congestion, or possibly equity concerns such as affordability may justify public funds in the delivery of passenger services. While supporting public rail networks which perform valuable economic and social roles, the Bank also encourages private sector participation

in those passenger rail services than can realistically be structured as periodically contestable operating concessions.

90. Publicly-owned railways can themselves try to diversify financing sources to reduce dependence on budget funding. For example, following its corporatization and separation from the Ministry of Railways, Russian Railways (which has traditionally been a self-financing organization) has been able to secure a credit rating and a small non-sovereign backed commercial loan. Rolling-stock leasing, private ownership of wagons, divestment of short-lines to local entrepreneurs, joint venturing with private investors for station modernizations, and sale of haulage or train paths to private parties can all increase the proportion of private capital involvement sourced by public railway systems.

### *Ports*

91. For larger ports the model usually favored by the Bank Group is that of a public corporatized and commercially run “landlord” port. The public firm rents out the right to use the infrastructure to private stevedoring firms, and is responsible for investment in and maintaining channels, wharves, and common areas. There may be a need for regulation of the price of stevedoring services, unless the port is large enough to encourage competition between multiple stevedore firms. Small ports are usually vertically integrated to include stevedoring; and are usually left in the public sector.

### *Airports*

92. The Bank Group generally supports private involvement in airport investment. For major airport projects there will usually be few barriers to private involvement. Larger airports typically have fairly secure revenue streams (airport shopping, landing fees, etc), subject to normal commercial risks such as the level of consumer demand. Private investors are well-used to bearing such risks. Investment requirements range from ongoing maintenance to construction of new terminals, to construction of entire airports. Depending on the readily calculable balance of investment obligations and revenue streams, private investors will or will not be interested. If they are not interested, it is questionable whether market demand is sufficient to warrant any public involvement either.

93. One case where public investment may be warranted, even when no private investor is interested, is small regional airports, where governments may decide it is in the public interest to facilitate inter-regional transport. The key question to



answer is if other modes of transport cannot provide the needed transport in more cost-effective fashion.

94. A second reason why there might be a distinction between the views of private investors and government about the desirability of particular airport investments is the possibility that private investors fear regulatory risks. Governments have a legitimate role to ensure that private operators do not misuse market power to extract excessive rents. But regulation of airports is at the wholesale level, which can usually be reasonably handled quite well in contractual documents at the time of turning control to the private operator. Moreover, even where the Government retains some regulatory discretion over airport prices, the political stakes are less than in other infrastructure industries (there are fewer consumers and little concern for the poverty of airline passengers). Thus, regulatory risks are of less concern for airports than for utilities, and governments should be capable of providing the necessary assurances to potential investors. Bank Group guarantees might be used to address this concern, but operational lending will be rare in this sub-sector

95. Air navigation services should keep pace with technological and global standards while meeting growing demands, and should be performed on a cost recovery basis (end-users of these type of services – airlines and passengers – do not have relevant affordability and/or willingness to pay constraints). Full private ownership in this sector is not a realistic option or business model given today's safety and security concerns. However efforts to provide these services on a more commercial basis and independent from government's budget process can result in improving overall efficiency in the provision of ANS and the development of its infrastructure.