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The Pillars of Utilities Provision: What is the role of the Public in Public Utility Provision?

Preliminary Draft

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Introduction

The debate on public utilities and services, in sectors such as electricity, gas, water, transportation, and telecommunications, is often framed as a dichotomy between public or by private provision.

Some argue that government ran or owned utilities tend to focus on “non-commercial goals” (which include the insurance of universal access) to the expense of efficiency (Gomez-Ibanez (2006)). Some others argue that the private sector tendency to focus on cost recovery fail to promote social objectives. For instance, Bayliss and Mckinley (2007) argue that the privatization process of water and electricity in sub-Saharan Africa has been a widespread failure and that resources should be re-directed in order to strengthen the public-sector capacities.

But how much of the failure (or the success) can indeed be attributed to the fact that the service was provided by a private institution? Would the re-direction of the management of this service toward to the public sector be enough to solve the challenges? Can privatization solve the problems that arise in the process of provision of utilities?

In trying to help to understand that and other cases of private or public failures but also of successes in providing utilities, this paper steps away from the debate over whether the provision of utilities should be public or private. Instead, it proposes to look at the economic governance of utilities provision. By economic governance of utilities we mean the many facets of the interaction between the economic and political domains.

The study explores, from a microeconomic perspective, the question of how the efficiency, effectiveness, and equity in the provision of services through utilities can be affected by democratic institutions, including organizational and regulatory frameworks. The goal of the project is to offer a conceptual framework to assist policy makers to identify the economic governance challenges and options to address them in the utilities sector.

In the first part of this study, we discuss the conceptual framework that is based on the main theoretical foundations of utilities provision. In the second part of the study, we construct a decision tree based on this conceptual framework. The decision tree methodology follows Hausmann, Rodrick, and Velasco (2004) who propose a new approach to economic reform based on identifying relevant binding constraints to growth in individual countries. The decision tree will be used to identify the main challenges in utility provision in general but also the challenges to each individual country and sector. This methodology will assist policymakers in identifying the most effective choices available for utility provision according to a country’s institutions, population preferences and utility sectors characteristics (*we will probably centered the focus on the public – accountability*). *Ideally, we would like to be able to use primary data on consumer confidence – we might choose to perform surveys if possible and if the need arises*. The third part comprises the analysis of country cases as a test of the usefulness of our

methodology as a policy tool. Based on the cases studies and on the decision tree, we also construct a table of possibilities with assigned probabilities to causes and effects.

Section 1 – The Conceptual Framework

1.1. Introduction¹

According to Gomez-Ibanez (2003), up to the mid 1940s most utilities around the world were private. It was only in the period between the 1950s and the 1970s that they were nationalized – exceptions include the water and the solid waste sectors in France and many utilities in the US. Between 1970s and 1990s, many countries introduced reforms resulting in changes in the ownership of utilities, often through privatization, to attract foreign investment and unleash market efficiency. Changing in ownership also took the form of public-private partnerships and was accompanied by changes in the oversight framework of state-owned firms.

Most reforms sought to create a reliable and credible climate to bolster domestic and foreign investments as well as enhance access, security, continuity, and affordability of services, promoting social equity. The assessment of this experience remains contentious. While outright reversals towards state-ownership were rare, they did occur and were highly visible (examples include the bankruptcy of Rail Track in the UK, and the termination of water concessions in Bolivia). Renegotiations were much more common, however: in Latin America, about half of all utility concession contracts have been renegotiated. The outcomes of reforms have often failed to reduce social and economic inequalities. For example, gains in access and quality are often concentrated in urban areas – urban access rates are 70% higher than in rural settings, but the urban population is less than 30% of the total in low and middle-income countries (Kikeri and Kolo 2005).

Among the many challenges of utility provision, the financing needs for utilities and infrastructure are very large – which speaks to the large gaps that remain. Estimates suggest that for 2005-2010 middle-income countries require 5.5%-7.0% of GDP and low-income countries require 7.5%-9.0% of GDP to meet their utility investment needs (Briceño-Garmendia, Estache and Shafik 2004). The OECD estimates that for 2005-2010 the total annual investment needs for utilities in middle-income countries will be \$356 billion and for low-income countries \$109 billion, with Africa alone requiring \$17-20 billion per year.

However, while financing needs are large, access to finance is only one challenge. Constraints to access, especially by the poor and vulnerable, may often result more from lack of empowerment and deficiencies in the accountability of providers to political institutions – as found in the 2006 Human Development Report on water and sanitation.

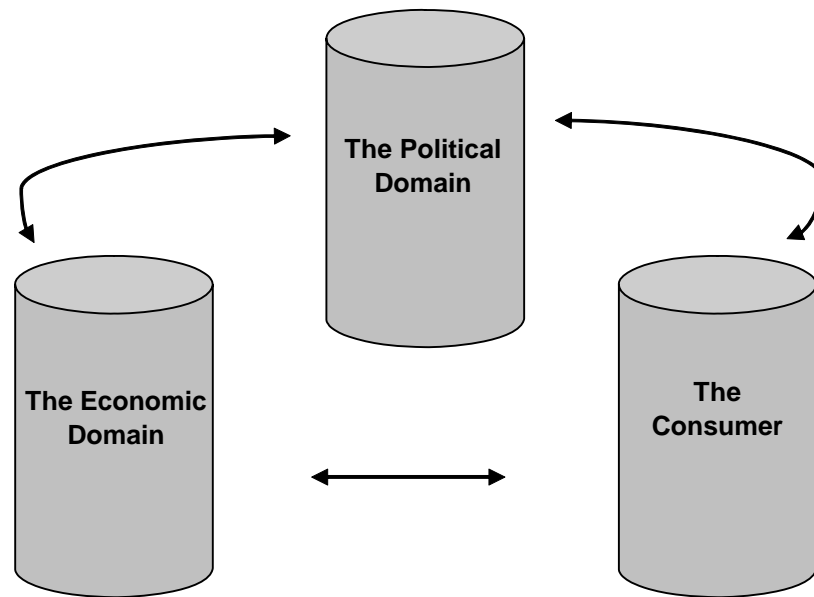
Key policy challenges in this area, which are elaborated in the following sections, may have been due to difficulties by governments in setting up appropriate regulatory strategies and weaknesses in the broader institutional setting (including a legal

¹ This section draws on work for the preparation of the terms of reference of the Spain-UNDP MDG achievement fund, thematic window democratic economic governance.

framework that ensures accountability to representative political institutions) that ensures stability and equitable access to utility services. Both the economic characteristics of utilities as well as the broad range of potential users of utilities set the stage for complex economic and political challenges when it comes to building, expanding, monitoring, regulating, and operating utilities.

The present study focuses on three pillars. That is, fundamental “structural” elements that condition performance of utilities provision: 1) the economic domain; 2) the political domain that comprise the political dynamics of provision and regulation of public utilities; and 3) the consumer. These three pillars influence each other: for instance, the cost structure of utilities has implications for the pricing mechanism of utilities, which in combination with the great number of potential users of utilities - who are also potential “voters” - increase the likelihood of politically motivated short-term shifts in policy (Figure 1).

Figure 1. The Pillars of Utility Provision



1.2. The First Pillar: The Economics of Public Utilities

The economic structure of utilities – which typically includes large and specific sunk investments, economies of scale, and a broad range of domestic consumers – and the characteristics of the utility services provided – basic essential services – has strong implications for the type of market structure under which utility firms operate. That itself offers a great challenge to the process of provision of utilities.

Investment by utilities tends to be large and specific, and cannot often be deployed in other uses. Utilities will be financially sustainable as long as operating revenues cover operating costs, **which include a return on the utility's nonspecific investments.**

Utilities also tend to involve economies of scale because of the large fixed costs associated with their cost structure. Economies of scale, in turn, encourage the gathering of activities because production by a single firm is more efficient under increasing returns to scale. This tends to give rise to the formation of natural monopolies which are likely to cause economic distortions.

According to Tirole (1995), the best-known monopoly distortion results from the monopolist pricing behavior. In a monopoly, the firm can raise its price above marginal cost without losing all its clients. Unless the monopolist is able to perfectly price-discriminate, monopolistic structures lead to high prices and to a “dead-weight” welfare loss for society. Monopoly power can also have perverse effects on supply because of lack of competition. Monopolies thus have little incentives to adopt cost-cutting strategies which can lead to managerial slack (Machlup (1967)).

Utility services typically have a broad range of domestic consumers, often as broad as the entire population of the country. Furthermore, the services are often aimed to attend basic needs that consumers cannot regularly postpone or easily substitute. The wide base of domestic consumers and the essential character of the services imply that utility pricing will always have a strong political component (Levy and Spiller (1996)).

In some cases, a higher demand may limit the formation of natural monopolies as it allows the accommodation of more than one firm in the market. This partly explains why the U.S. satellite broadcasting market accommodates several competitors despite high fixed costs. In other cases, technology can also decrease the likelihood of natural monopolies to exist by allowing the possibility for regionalization and for small-scale units to operate. For instance, the Committee on Privatization of Water Services in the United States Water Science and Technology Board Division on Life and Earth studies (2002) cites technological advances in water treatment processes, including ozonation, membrane filtration, and use of ultraviolet disinfection as potential options that would facilitate the regionalization of services. Often, however, the potential for competition is limited in several cases because of the kind of infrastructure required in the provision of some public services (e.g. water pipeline infrastructure) or the cost associated with the implementation of new technological advances. In such cases, one has to look for alternatives to increase efficiency and to diminish the perverse effect of the economic distortions caused by the monopolistic nature of the industry.

1.3 The Second Pillar: The Political Dynamics of Provision and Regulation of Public Utilities

As discussed in the preceding section, public utilities typically require large specific and sunk investments, and are associated with large economies of scale which may make competition in this sector technically difficult. The economic structure of the public utilities in combination with the great number of consumers of utilities who are also potential “voters,” increases the likelihood of politically motivated short-term shifts in

policy and may also affect the likelihood of opportunistic behavior by incumbent suppliers.

Indeed, the intrinsic economic nature of utilities implies that the government, the supplier (who can be either privately or state owned, or a combination of both), and the consumers are all vulnerable to each other. An opportunistic incumbent operator may hold the government hostage with low quality of service and high prices because the incumbent knows that entry is difficult. Consumers are largely immobile and cannot easily move somewhere else where services are cheaper and better. These challenges exist even if the utility is state-owned, due to agency and information asymmetry problems between the government and its oversight responsibilities and the state-owned utility managers.

But the incumbent is vulnerable to opportunistic behavior by the government, too. Public as well private firms may suffer from administrative expropriation. Once the investment has been made, the government may just decide to change the rules in a way that is favorable to its particular political circumstances – a typical time-consistency type of problem – harming the returns expected by private firms by setting prices below the company's average long-term average costs, or by imposing specific requirements for investment, equipment purchase, or labor contracts. Political interests may also affect public companies; for instance, by impeding goals agreed with managers of state-owned enterprises to be met or by systematically under-funding public utilities (Levy and Spiller 1996). The ability of the government to manipulate utilities or to expropriate will likely influence the confidence of investors, the public, and the performance of utilities.

To ensure stability and commitment to all involved, with incentives that lower the chances for politically motivated short-term decisions and of opportunistic behavior, governments may choose to regulate and to adopt time-consistent policies that aim to strengthen their reputation and increase the commitment of all parties involved. Consumers play an important role in increasing the economic and political legitimacy in the process of utilities provision and regulation. Where potential demand for utility services is strong, the political cost of investment impediments might be too high for opportunistic behavior to pay-off.

Regulation

Regulation is often proposed as a mean to capture the efficiency advantages of monopoly while eliminating the potential risk of monopolistic abuse. As suggested by Viscusi, Vernon, and Harrington Jr. (2001), economic regulation generally recognizes that market concentration may be inevitable and, in some cases, a superior structure for a particular market. The intent is then to limit the losses that might be inflicted by that kind of structure by imposing limits to the performance of the participants.

But regulation has also its limitations. Noll (1989), for instance, suggests that regulatory policy is promulgated through a complex set of agency relationships, each of which typically involving multiple principals and multiple agents. Regulatory policies may therefore be vulnerable to the degree to which agents comply with the preferences of principals. Regulation is likely to suffer not only from conflicting objectives but also

from informational asymmetries that may, for instance, constrain the ability of the principal to design complete and efficient contracts (Lafont and Martimort 2002).

The effectiveness of regulation will also depend heavily on the strength of the institutions of a given country, the technological capability of the regulator to write contracts, the availability of information, and the ability of regulators to foresee all possible contingencies. The more economic, political, or socially instable is a country, the smaller the probability for contracts to be complete. Even when contracts are complete, weak institutions decrease the enforceability of regulations. For instance, Gomez-Ibanez (2003) argues that concessions contracts are popular in many developing countries largely because they are thought to be less vulnerable to weak institutions than discretionary regulation.

To circumvent the problem of designing a complete contract, discretionary regulation is often adopted. However, unless a country's institutions allow arbitrary behavior to be distinguished from useful regulatory discretion, granting generous administrative discretion might imply unsatisfactory levels of investment and welfare.

Countries whose reputation has been eroded may choose to adopt inefficient, incomplete, and inflexible regulatory regimes to enforce fiscal discipline and to build reputation so as to provide the adequate incentives for investment. Credibility and time-consistency will then enable countries to exert some regulatory discretion in the longer term.

Time Consistency and Policy Continuity

The vulnerability of utilities to government interventions is likely to influence the confidence of investors, of consumers, and the performance of utilities. Perhaps even more important than regulation is the ability of a government to commit to rules and to avoid opportunistic behavior. Kydland and Prescott (1977) argue that by relying on some policy rules, economic performance can be improved while discretionary policies will not typically result in the social objective function being maximized. Spiller and Savedoff (1999) identify government opportunism in the provision of water as the main reason for the poor performance of utilities whether they are public or private.

According to Dixit (1996), opportunism arises in a particular way, combining dynamic inconsistency with moral hazard, when in a contract between two parties to exploit a mutually profitable opportunity; at least one party must generally make an irreversible investment. Once it has done so, it will become vulnerable to demands of the other party to renegotiate the contract, made under the threat of dissolving the whole relationship. This makes even ex competitive relationships ex post bilateral. If unresolved, this problem would lead to severe underinvestment because the party contemplating its investment decision would look ahead and recognize that its return on the investment is going to be expropriated by the other.

The lack of trust can jeopardize the ability of a government to implement changes or reforms in general. Indeed, a bad reputation can persist for years and are likely to increase the cost of implementation of reforms to prohibitive levels. Especially if one

considers that policy acts have long-lasting effects. As Dixit (1996) suggested, individual political acts often create facts, institutions, and expectations that have their own momentum and acquire at least some of the same durability as a change in the “law” itself. Reversal becomes politically and economically costly.

Elections and unexpected changes in the government may sometimes also affect investors’ and savers’ perceptions about policy continuity. Political instability is likely to increase the risk perception of investors and savers, and thus, increase the bidding price and decrease the willingness to save. At the same time, people need to perceive that policies are flexible enough to respond to necessary adaptive changes or to eventual shocks. According to Laffont and Tirole (1993), at any one time, the government is controlled by one political party or another, favoring one special interest or another. If the government of the day were allowed to lock in the policy by a long-term commitment that exceeds its own expected life, this may preclude changes that would be demanded by future majorities. This, in turn, would likely affect people’s perception of policy continuity today because these commitments are not enforceable in the long-term.

The fact the utility services affect a broad range of consumers, make this sector especially vulnerable to arbitrary behavior. Spiller and Tomasi (2005), for instance, argue that public utilities are susceptible to politicization because they affect large pools of potential “voters.” At the same time, the cost structure of public utilities affects the pricing mechanism. Politicians and interest groups therefore care about the level of utility pricing and are likely to intervene to gain political support. (*see other references here Barzel 1989; Goldberg 1976; North 1990; Williamson 1988; from Levy and Spiller 1996*)

Finally, the consumer plays a key role in enforcing the government to commit to rules and to avoid arbitrary decisions. The stronger the potential demand of utility services and the greater the support of the public in the process of utility provision, the less likely for the government to intervene and the more likely for rules to be followed. Mapping consumers’ characteristics (e.g. accessibility to utility service, income level, etc) is therefore essential for the success and the sustainability of reforms in the public sector. Happy consumers will likely increase the economic legitimacy of utility provision and regulation.

1.4 The Third Pillar: The Consumer

Curbing opportunistic behavior is pivotal to the process of provision and regulation of public utilities. Both consumer confidence on the institutional framework and economic viability are essential to legitimize any efforts to increase the efficiency and broaden the access of public services. Indeed, there is evidence that, without legitimacy, economic reforms can erode public trust in markets – even as they succeed in other respects (World Bank, 2004).

Both political as well as economic legitimacy are important in the public utility provision. Legitimacy decreases the likelihood of politicization by increasing the likelihood of acceptance of economic processes by the consumers of public services who are also the voters. By decreasing the possibility for the government to behave in an opportunistic

way, legitimacy increases the sustainability of the public utility policies. Ex ante the increased perception of sustainability decreases the perceived risk and thus the cost association with reforms.

Political legitimacy can be enhanced, for instance, through equitable, just, transparent, and accountable economic and political processes. Desai and Olofsgard (2006)'s analysis of data on public opinion in Latin America and in Eastern Europe in the 1990s suggests that the creation of checks and balances and other mechanisms that limits executive-branch power increases the popularity of markets. They argue further that the magnitude of this effect is heightened in the earlier phases of reform, when the risk of expropriation is perceived to be the greatest, and diminishes as reforms proceed. Shirley (2004) argues that the unpopularity of privatization of utilities in Latin America is a result of deeper institutional and not of economic failures. But transparency and accountability are also important for the legitimacy of the public sector. To increase accountability, Kidland and Prescott (1977), for instance, suggest that in a democratic society, it may be preferable for selected rules to be simple and easily understood, so it is obvious when a policymaker deviates from the policy.

In contrast with Shirley (2004)'s study that argues that economic legitimacy plays a less relevant role, we argue that economic legitimacy plays a pivotal role next to the political legitimacy. Transparent, equitable, and just institutions can fail to provide affordable services. The cost associated with provision of public services may not be economically viable because the population may simply not be able to afford them. The use of privatization may not be a necessary good solution in this case because suppliers may not be able to offer utility services at the prices the population would be able to afford them. In the absence of subsidies from the government and in the face of a weak demand, firms may choose to pull out or to decrease costs, which could imply a drop in the quality of the services or products offered. The public provision of utilities would be equally difficult because of the cost associated with it and the challenges on how to finance these costs. Understanding the potential of the demand is therefore important to assess the sustainability of economic reforms that aim to improve the quality of as well as broaden the access to public utility services.

Section 2 – Methodology (*in progress*)

2.1 Introduction

Following Hausmann, Rodrik, and Velasco (2004), we construct a decision tree that aims to identify relevant binding constraints to utility provision in general but also the constraints to each individual country or sector. The aim is to have a policy tool that can help policymakers to identify the most effective utility reform choices available given the main constraints related to the country's institutions, population preferences and utility sectors characteristics.

This methodology seeks to address the fact that different countries and sectors offer specific challenges that require policy makers to formulate individually crafted solutions. While this can be a useful tool in identifying and isolating key constraints to utility

reform, there are shortcomings. Leipziger and Zhaga (2006), for instance, identify five unresolved issues when applying Hausman, Rodrik, and Velasco's framework to analyze growth in twelve pilot studies that included countries like Brazil, Egypt, India, and Tanzania. Although our framework aims to study utility provision and not growth, we find similar unresolved issues as those pointed out by Leipziger and Zhaga when looking at specific case studies. Those include: the lack of dynamism when analyzing possible constraints throughout the reform process (i.e. in any reform process, as one constraint is lifted, others may emerge); the identification of constraints being a "disciplined art" more than a science; the need for in-depth knowledge of the country's institutions and economic conditions. We also face problems related with the fact that tree structures require a sequential mode of thinking – constraints may occur simultaneously as suggested by Dixit (2006).

2.2. Diagnosis Framework: Identifying Bidding Constraints

The tree structure maps the challenges that governments tend to face when setting up structures to provide utility services. It is constructed based on the theoretical foundations of the three pillars analysis from the previous section.

[erased] Lack of service and financial constraints are identified as main problems to be solved by governments. By lack of service, we mean improvement in quality and/or efficiency, and/or expansion of services to include a larger customer base due to, for instance, underservicing or population growth. Operating firms can also face financial constraints when providing utility services.

Based on the three main pillars of utility provision – the economic domain, the political domain, and the consumer – we identify three main decision nodes in the tree structure of utility provision bidding constraints. They are: the demand, the infra-structure, and the political environment (Figure 2). In contrast to Hausman, Rodrik, and Velasco's original diagnostic framework, we allow our decision tree to have more than one round of decision choices (see fat arrows in Figure 2). That allows policy makers to identify bidding constraints that are of secondary importance or that may emerge once the primary constraint is lifted.

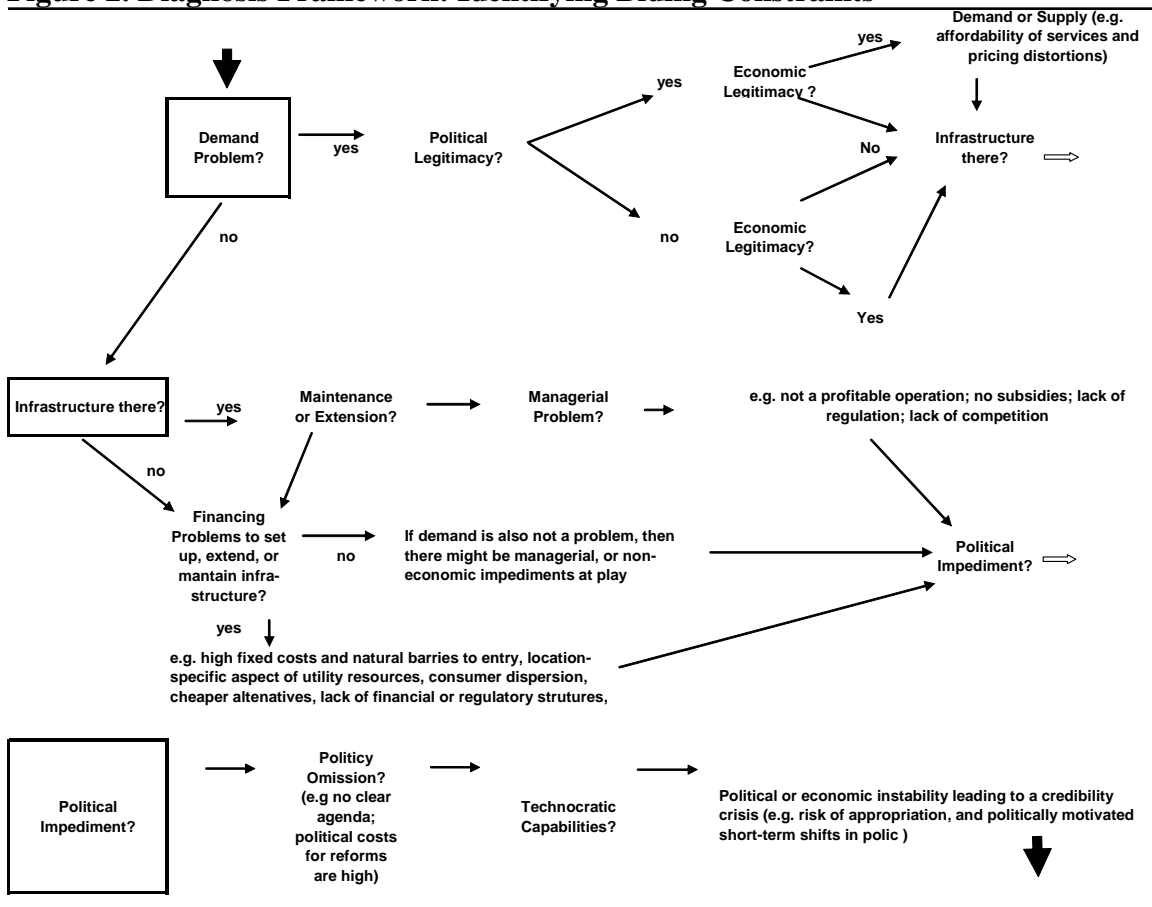
The tree depicts the relevant policy questions on utility provision. Is there a problem of demand, or infrastructure, or are there also political impediments? What is the crucial constraint that deserves the most attention from policy makers?

If it is due to demand, is that due to a lack of political or economic legitimacy? If it is due to economic legitimacy, is affordability bidding the population's access to services? Is the affordability a question of income, a lack of subsidies and transfers, or is it due to a supply distortion (e.g. price distortion because of the existence of natural monopolies)? If it is due to infra-structure, is it a question of lack of capital or is it a managerial fault? And if there is no infra-structure, are there private or public financing impediments? Finally, are there political obstructions that may be hindering the provision of utility services?

As in Hausman, Rodrik, and Velasco's growth diagnostic, the goal is to identify the singular most binding constraint that we will define as the primary binding constraint. Several rounds of decision choices will allow policy makers to rank the foreseeable binding constraints. In this way, even if the reforms are implemented in stages, foreseeable constraints would be taken into consideration at stage one and would thus strengthen the sustainability of the overall reform process.

For instance, assume that the government of a specific country, wishing to solve the problem of lack of water service to part of its population, chooses to privatize the water industry. If we further assume that the major binding constraint impeding that part of population access water was indeed a demand problem, e.g. affordability, then a privatization reform will not be enough to solve the problem of lack of service in that specific country.

Figure 2. Diagnosis Framework: Identifying Binding Constraints



Based on the tree structure and the case studies, the next step would be the creation of a Table of Possibilities to assess the likelihood of failures and success according to the challenges and the kind of institutional framework in place in a given country/sector. The table seeks to respond to Dixit (2006)'s criticisms about the shortcomings of a sequential mode of thinking implied by a tree structure when multiple causes can occur simultaneously. An example of the structure is depicted in Figure 3. The rows list causes

and the columns list effects. The second column has the prior probabilities with which the various causes can occur – we will use case studies and historic analysis to estimate these probabilities. The entries in the other cells are then conditional probabilities. For instance, row 2 and column 2 will give us the probability that under servicing occurs when political uncertainty is present. In principle, econometric research could give us such probabilities, although this is not how regression results are usually presented. The shortcomings of this methodology to be solved: 1) degrees of political uncertainty (or of any other categories) may affect the probability of an event (one could imagine that his category could be a composite of several degrees of uncertainty); 2) quantifying political uncertainty (or any other category) might be a challenge (one could use surveys for political uncertainty, for instance, but those are not always available).

Figure 3. Comprehensive Table of Possibilities

Causes	Prior Probabilities	Effects			
		Lack of Services (Service Expansion)	Lack of Service (Efficiency)	Lack of Service (quality)	Lack of Investment
1. Political Legitimacy					
1.1. Political Uncertainty					
1.2. Lack of Tools of Accountability					
1.3. Existence of Check and Balances					
2. Economic Legitimacy					
2.1. Affordability due to Income					
2.2. Affordability due to Pricing or Quantum distortions					
2.3. Taxes and Subsidies					
3. Financing					
4. High Fix Costs					
5. Competition					
6. Regulatory Structures					
7. Fiscal Constraints					
8. Managerial					
9. Political Omission					
10. Technocratic Capabilities					
11. Political Instability					
12. Credibility Shocks					
13. High Political Costs					
14. Other					

Section 3 – Case Studies

The case studies aim to assess the usefulness of the policy tool while studying empirically the failures and success of utility provision in certain countries and sectors.

3.1 The Case of Urban Water Supply in Santiago, Chile

In the late 1980s Chile’s Santiago Metropolitan Sanitary Works Enterprise (Empresa Metropolitana de Obras Sanitarias, or EMOS) was reformed under public ownership and then ultimately privatized in 1999 (Shirley, Xu, and Zu luaga, 2000). The reform process under public ownership in Chile is often cited as an example of success in urban water systems reform (Noll, Shirley, and Cowan, 2000). Shirley et al (2000) suggest that EMOS’s main problems appear to have being the result of lack of funds for maintenance and expansion. We use the tree methodology described in section 2 to analyze the Chilean’s success case. Financial problems seemed to have been EMOS’ largest problem previous to the reform process in the late 1980s.

- Was there a Demand Problem prior to the Water Reform in Santiago?**
 As suggested by Shirley, et al (2000), initial conditions prior to reforms in Santiago's water sector were relative good. According to Noll, et al (2000), the connection rate to water reached 99% of the total population in service area. They also suggest that the rate of coverage was likely to have been overstated because the total population in the service area did not include households in informal settlements that were not linked to networks, nor did it include poor communities outside the concession boundary. However, the overstatement should not be considered extraordinary. It is estimated that the service area covered approximately 4.4 million people, which roughly comprised the total population of Santiago in 1988 (Noll et al (2000), table 7.2, pp 263).
- Was there an Infrastructure Problem?**
 As implied by the rate of coverage (99%), the lack of infrastructure did not seem to be a problem in the Chilean case. Yet, reports of leakage, low pressure, and occasional interruptions in the service suggested that other administrative problems were at play. According to Shirley et al (2000), some of EMOS' facilities were old and much in neither of repair and replacement by 1990. More than a managerial fault, financial capability to maintain and extend services to accommodate for the population growth appeared to have been a problem in EMOS case. The World Bank regarded EMOS as efficiently managed and performing well relatively to other operating companies in the region ([World Bank 1992, p.34](#)). The World Bank also suggested that EMOS had financial problems that were hindering investment in maintenance and expansion. Shirley et al (2000) argued that EMOS suffered a loss between the early 1980's until 1987 because tariffs were not allowed to increase in real terms [NEED to CHECK FOR INFLATION AND TARIFF PRICE INCREASE IN THE PERIOD]. Indeed, tariffs were below the World Bank estimates of EMOS' long run marginal costs. In addition to EMOS' tariff revenues problems, the Ministry of Finance restricted EMOS' leverage capability by imposing borrowing constraints as a way of keeping the debt of state owned enterprises low.
- Were there political impediments?**
 Noll et al (2000) argue that prices in Santiago's EMOS were set below fixed costs by the government for political reasons. EMOS losses lasted through the 1980s culminating with the government having to raise prices to breakeven levels shortly the 1990s reforms. *Missing the reasons for keeping prices low.* The decision of the government to keep prices below costs suggests that water provision could be vulnerable to politicization if tariffs were to increase.

Overall the tree diagnostic analysis of the period pre-reform in Chile suggests that the main bidding constraint to the process of water provision in the Santiago's case was EMOS' weak financial situation resulted in part from low water tariffs imposed by the government throughout the 1980s and in part from a system of price adjustment that did not keep up with inflation. [Besides, a weak public finance status imposed restrictions on EMOS' capability to borrow \[CHECK\]](#). The reform that would follow would need to

include higher sustainable tariffs adjusted to inflation with the support from the public, and/or an increase in cost efficiency. If part or all of this reform included privatization, rules would need to be specified to decrease the threat of government imposed price controls that were implemented throughout the 1980s.

I would argue that the reason for the success of the Chilean case on water supply is the fact that the reform was successful in tackling the bidding constraints identified above.

Reform of Urban Water Supply in Santiago, Chile

When comparing with the tree diagnostic, the bidding constraints were closely considered when analyzing the main components of the water reform in Santiago, Chile.

Water tariffs were increased in real terms and an adjustment formula was implemented in a way that tariffs were indexed to inflation and were adjusted every five years based on marginal costs. To guarantee affordability, a direct subsidy was paid to the company by the municipality from federal budget for all low-income consumers. A regulatory body was created to be responsible for setting tariffs, setting and enforcing technical standards, and granting concessions for water supply and sewerage services. This regulatory body was attached to the Ministry of Public Works, most likely to ensure accountability of its decisions. The water utility company that was previously to the reform an autonomous entity under public law, now would become a state-owned corporation under private commercial law (Shirley et al, Table 1, pp. 2, 2000). [\[Need to find differences between public and private laws\]](#)

Section 4 – Lessons Learned and Conclusion

- *To apply this methodology to case studies, one needs to learn about countries and situations pre-reform (that may involve questionnaires and surveys).*
- *Chile case may be more straightforward and uncomplicated than other cases.*

Section 5 - Reference

Bayliss, Kate and Terry Mackinly. 2007. “Privatising Basic Utilities in Sub-Saharan Africa: The MDG Impact.” Policy Research Brief, no.3 Jan/2007, International Poverty Centre, UNDP.

Briceño-Garmendia, Cecilia, Antonio Estache and Nemat Shafik. 2004. “Infrastructure Services in Developing Countries: Access, Quality, Costs and Policy Reform”. World Bank Policy Research Working Paper 3468. World Bank, Washington, D.C..

Committee on Privatization of Water Services in the United States Water Science and Technology Board Division on Life and Earth Studies – National Research Council. 2002. Privatization of Water Services in United States: An assessment of Issues and Experience. Washington, DC: National Academy Press.

Desai, Raj M. and Anders Olofsgard. 2006. “Political Constraints and Public Support for Market Reform.” IMF Staff Papers 53: 92-114.

Dixit, Avinash K. 2006. "Evaluating Recipes for Development Success." World Bank Policy Research Working Paper 3859, March 2006. World Bank, Washington, D.C..

Dixit, Avinash K. 1996. *The Making of Economic Policy: A Transaction-Cost Politics Perspective*. Cambridge, MA: The MIT Press.

Gómez-Ibáñez, José A. 2003. *Regulating Infrastructure. Monopoly, Contracts, and Discretion*. Cambridge, MA: Harvard University Press.

Gómez-Ibáñez, José A. 2006. "Alternatives to Privatization Revisited: The Options for Infrastructure." Manuscript.

Hausman, Ricardo, Dani Rodrik, and Andrés Velasco. 2004. "Growth Diagnostics." Harvard University, Kennedy School of Government. Working Paper.

Kikeri, Sunita and Aishetu Fatima Kolo. 2005. "Privatization: Trends and Recent Developments." World Bank Policy Research Working Paper 3765. Washington, D.C.: World Bank.

Kydland, Finn E. and Edward C. Prescott. 1977. "Rules Rather than Discretion: The Inconsistency of Optimal Plans." *The Journal of Political Economy* 85, 3 (June 1977): 473-492.

Laffont, Jean-Jacques and David Martimort. *The Theory of Incentives: The Principal-Agent Model*. Princeton University Press.

Laffont, Jean-Jacques and Jean Tirole. 1993. *The Theory of Incentives in Procurement and Regulation*. Cambridge, MA: The MIT Press.

Leipziger, Danny and Roberto Zaghera. 2006. "Getting out of the Rut." *Finance and Development*, Volume 43, Number 1 (March 2006).

Levy, Brian and Pablo T. Spiller. 1996. *Regulations, Institutions, and Commitment*. Cambridge University Press.

Machlup, F. 1967. "Theories of the Firm: Marginalist, Behavioral, Managerial." *American Economic Review* 72: 816-824.

Noll, Roger G. 1989. "Economic Perspectives on the Politics of Regulation." In *Handbook of Industrial Organization*, Volume 2, Richard Schmalensee and Robert Willig (editors). New York: North-Holland.

Noll, Roger, Mary M. Shirley, and Simon Cowan. 2000. "Reforming Urban Water Systems in Developing Countries," in *Economic Policy Reform: the Second Stage*, edited by Anne O. Krueger, The University Chicago Press.

OECD (Organisation for Economic Co-Operation and Development). 2005. "The DAC Guiding Principles on Infrastructure for Poverty Reduction". Draft – August 2005. Paris.

Shirley, Mary (2004) Why is Sector Reform so Unpopular in Latin America? The Ronald Coase Institute, Working Paper Number 4, January 2004.

Shirley, Mary M., L. Colin Xu and Ana Maria Zuluaga. 2000. "Reforming the Urban Water Supply: The Case of Chile." World Bank Policy Research Working Paper 2294, March 2000. World Bank, Washington, D.C..

Spiller, Pablo T. and M. Tommasi. 2005. "The Institutions of Regulation: An Application to Public Utilities." In Claude Menard and Mary M. Shirley, eds., Handbook of New Institutional Economics. New York: Springer.

Spiller, Pablo T. and William D. Savedoff. 1999. "Government Opportunism and the Provision of Water." In: Savedoff, W. D. and Spiller, P. T. Spilled water: Institutional Commitment in the Provision of Water Services. Washington, D. C. Inter American Development Bank, 1999.

Tirole, Jean. 1995. The Theory of Industrial Organization. Cambridge, MA: The MIT Press.

UNDP (United Nations Development Programme). 2004. Democracy in Latin America: Towards a Citizens' Democracy. New York: UNDP.

UNDP Human Development Report. 2006.

Viscusi, W. Kip, John M. Vernon, and Joseph E. Harrington, Jr. 2001. Economics of Regulation and Antitrust. Cambridge, MA: The MIT Press.

World Bank. 2004. World Development Report 2005: A Better Investment Climate for Everyone. New York: Oxford University Press.