New Tools for Studying Network Industry Reforms in Developing Countries: The Telecommunications and Electricity Regulation Database

SCOTT WALLSTEN, GEORGE CLARKE, LUKE HAGGARTY, ROSARIO KANESHIRO,
ROGER NOLL, MARY SHIRLEY, AND LIXIN COLIN XU *

The World Bank Group and the AEI-Brookings Joint Center for Regulatory Studies

Abstract

We construct comprehensive and consistent datasets on telecommunications and electricity regulations in developing countries through extensive surveys of regulators. The database of telecommunications regulations includes 178 variables on regulatory governance and content in 45 countries. The database of electricity regulations includes 374 variables in 20 countries. This paper motivates the data collection exercise, explains the survey design, and provides a few examples of the types of information and results the data can yield. The appendix provides links to the freely available datasets and codebooks.

1 Introduction

Infrastructure industries including telecommunications, electricity, water, and gas underwent massive structural changes during the 1990s. During that decade, hundreds of privatization transactions valued at billions of dollars were completed in these sectors in developing and transitional economies, or DTEs (Table 1). While privatization has received the most attention in both the popular and academic literature, reforms have involved more than just privatization. They have also included market liberalization, structural changes like unbundling, and the introduction of new laws and regulations.

Until recently, infrastructure sectors were generally considered “natural monopolies,” meaning that people believed that a single firm could provide service at the lowest cost. As a result, most countries restricted entry, allowing single firms, which were usually state-owned, to provide service in each industry.¹ Even after technological progress made the natural monopoly argument less tenable – especially in the telecommunications sector – these firms typically retained a dominant, and often monopoly, position in most countries.

* Scott Wallsten, AEI-Brookings Joint Center, 1150 Seventeenth Street, N.W., Washington, DC 20036, fax: 202-862-7169, phone: 202-862-5885. E-mail: swallsten@aei.org All findings, interpretations, and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent. We thank Katrina Kosec for excellent research assistance.

¹ In the telecommunications sector, single enterprises usually provided service over the entire country. In other sectors, such as water, although there were often multiple providers within any country, they usually had a monopoly in the region where they provided service.

Privatization therefore meant creating a private firm capable of exercising significant market power. In other words, even when competition was feasible, the presence of a dominant firm often made its introduction difficult. Regulatory agencies and regulations thus became an integral component of reform as a means of protecting consumers, reassuring investors, and, presumably, helping to advance competition.² Nonetheless, in developing countries the design of regulatory policies and structures to govern infrastructure industries after privatization was often given relatively little attention compared to privatization itself (see Kessides, 2004, for a comprehensive overview of regulation in DTEs).

	<i>Proceeds</i>	<i>Number of transactions</i>
Telecommunications	70,579.40	125
Electricity & Power	43,096.24	221
Railways	4,000.55	30
Ports & Airports	2,339.29	54
Roads	2,121.05	10
Water & Sewerage	1,084.66	10

Table 1: Infrastructure privatizations in developing and transition economies (1990-1998)

Note: Proceeds are in millions of US\$. Source: World Bank File data.

Several factors may help explain the relatively low weight given to regulation. First, fiscal crises often motivated reforms, making many believe that it was important to privatize quickly.³ While privatization transactions are by no means simple, they are in many respects more straightforward than designing regulations and regulatory agencies. Speed thus meant privatizing first and worrying about regulation later.⁴ Second, there was concern that regulatory agencies would simply become a new mechanism through which the state could interfere with the market.⁵ Finally, industrialized countries were beginning

² While the phrase “regulation” is quite broad, we focus on regulatory agencies that deal with privatized infrastructure; that is, “utilities which require a fixed network to deliver their services” (Newbery, 1999). It is worth noting, though, that other types of regulation in developing countries are beginning to receive attention in the literature, as well. For example, Djankov, et al (2002) attempt to measure how regulations affect firm entry in general.

³ Because reform was sometimes motivated in part by the need for revenue, policymakers often tried to maximize revenues by granting temporary monopolies to the privatized utilities, rather than trying to maximize some broader measure of economic surplus or welfare. Such an approach seems to have been successful in increasing investors’ valuations of companies, but the monopolies tended to invest less than firms that operated in competitive environments (Wallsten, 2000).

⁴ The speed of privatizations was debated almost from the start of the privatization trend, with some arguing for speedy privatization (see, for example, Lipton and Sachs, 1990), and others arguing for a slower approach with greater emphasis on building regulatory institutions (for example, Newbery, 1991; Summers, 1994). While the fast privatization argument generally won out, many now believe it should have been done more slowly (see, for example, Stiglitz, 1999).

⁵ This fear is still a real one. A recent proposal in Russia would have established a single agency to coordinate tariffs in energy, railways, transport terminals, atomic energy, water and air transport, gas and

to realize the costs of regulation and were rapidly deregulating industries where there appeared to be little economic reason for it (Winston, 1993). In that context it could have seemed somewhat hypocritical to advocate new regulatory authorities in transition and developing countries while dismantling them in industrialized countries.

Just as designing and implementing regulation was subordinate to the privatization itself, empirical research has also focused far more heavily on privatization than it has on regulation. While some case studies have explored regulation in developing countries, most cross-country empirical work has involved little more than including a dummy variable indicating the presence of a regulator (and perhaps whether the regulator is, in theory, “independent”) in a reduced-form regression.

However, regulations, regulators, regulated industries, and politics interact in complicated ways that affect the development of the industry as well as the rest of the economy. The importance of these interactions has long been recognized and debated in the United States – the country with the most experience dealing with private (monopoly) utilities. Indeed, well before privatization became a worldwide phenomenon an extensive body of literature on regulation had developed in the US (see, for example, Baron, 1989; Braeutigam, 1989; Noll, 1989; Peltzman, 1976; Stigler, 1971).

One reason for the vast body of literature on regulation in industrialized countries is the sea of data generated as a byproduct of the interaction of regulatory agencies and regulated firms. Likewise, the main reason for the paucity of empirical work on regulation in developing countries has been the lack of data, which has prevented researchers from exploring regulation in any detail. Our survey of telecommunications and electricity regulators is an attempt to begin to fill this gap by providing systematic data to inform empirical analysis. The survey yields a large dataset that should help promote understanding of regulatory institutions as they actually function and how they interact with the industry and economy.

We are not the first to survey regulators. NERA (1997) conducted surveys of selected infrastructure utility regulators in six countries.⁶ The 12 surveys elicited responses that NERA then interpreted and graded, providing a kind of “scorecard” of regulators. While among the first of its kind, the information gathered tended to be verbal responses rather than data that could easily be compared. And because the 12 surveys were spread over many industries and few countries, the effort generated valuable information, especially for case studies, but not enough to be used for cross-country or cross-industry empirical analysis.⁷ We designed our surveys explicitly to generate data that can inform such empirical work.

communications – a proposal that sounds remarkably like centralized planning and optimization (Larina, 2001).

⁶ NERA’s (1997) survey covered electricity, gas, telecoms, transport, and water in Bangladesh, India, Indonesia, Malaysia, Pakistan, and the Philippines. They did not cover all industries in all countries, so the total number of surveys was 12.

⁷ Electricity was the best covered, with four regulatory agencies included. The others each had two. Three regulators were surveyed in India and Malaysia, two in Indonesia and the Philippines, and one each in Bangladesh and Pakistan.

2 Survey design

As discussed above, empirical research on infrastructure reforms in developing countries has largely ignored the role of regulation. Moreover, the few papers that have explored regulation have not gone much deeper than controlling for whether a regulatory agency exists, and perhaps whether it is considered “independent.” Our survey effort is an attempt to produce data that will allow empirical researchers to explore regulations and regulatory agencies in far more depth than has generally been possible to date. In this section we explain the general framework for designing the surveys. In the following two sections we provide some specific details regarding the telecommunications and electricity surveys, respectively.

For analytical purposes, regulations can usefully be broken down into governance and content (Levy and Spiller, 1994). *Governance* includes the structures that determine whether those incentives are credible and sustainable. In other words, governance includes rules that order the scope, configuration, and process of regulatory decision-making and the organization and procedures of regulatory agencies (for example, Levy and Spiller, 1996; Williamson, 1996). *Content* includes the specific laws and policies towards pricing, competition, access, and investment that shape incentives facing firms and consumers.

We designed the surveys to capture the large variance in both governance and content. Even basic ideas regarding what is considered important for effective regulatory agencies can take many forms and be subtly different across regulators. For example, it has become almost an article of faith among advisers to developing countries that in order to be effective a regulator must be independent from short-term political pressure. The small amount of empirical research that has investigated the issue typically uses a dummy variable to indicate whether or not a regulator is independent.⁸ Such an approach may be a reasonable first step for empirical research, especially when that dummy variable was the only extant empirical data, but characterizing a regulatory agency as either independent or not independent is unrealistic. No government agency is (or probably should be) completely independent, and can be more or less independent across a wide range of issues.

Thus, rather than ask whether a regulator is independent, we instead ask many objective questions that can help determine how independent a regulator is in different areas. So, for example, among other questions that might be relevant for independence, the survey asks how much of a regulator’s budget comes from industries’ fees, government appropriations, donors, and other sources; under what circumstances a regulator can be fired; and whether the country’s chief executive (president or prime minister) can veto regulatory decisions. Moreover, governance does not end with independence: accountability, transparency, capacity, and competency are also likely to be important features (see, for example, Noll, 2000). The surveys contain numerous measures of these criteria, as well. This approach allows researchers to gain a better understanding of the

⁸ See, for example, Baudrier (2001) or Wallsten (2001; 2002). Interestingly, none of these papers finds unambiguously positive effects of independence on sector performance, and finds some evidence of negative effects. These results could be because independence, in fact, is not good for development of the sector, because the regulator dummy variable is likely to be endogenous but is not treated that way in the regressions, because a dummy variable is an unsatisfactory measure of independence, or because independence is only one of many features of governance that work together as a system of checks and balances. The questions raised by these results highlight the need both for more empirical work on regulation and the data to do that work.

nuanced ways in which regulators may or may not be “independent” and how those ways may interact with other governance features (see, for example, Haggarty, Shirley, and Wallsten (2003) who use the telecommunications dataset to explore the extent to which countries meet these criteria and why they may exist in some countries but not others).

3 Country selection

Our intention was to survey all telecommunications and electricity regulators that were operating in developing countries in 2001. We first identified every developing country that seemed to have a regulatory agency with an email address or fax number. We sent the survey via email, fax, and regular mail to those agencies, and followed up with telephone calls. As is made clear below, we had more success with telecommunications regulators than with electricity regulators. This difference in response rates largely reflects the more advanced state of reforms in telecommunications compared to electricity.

4 The survey of telecommunications regulators

Between March and August, 2001, we contacted 60 regulatory agencies around the world. We ultimately received responses from 45 countries (Table 2). The result is an extensive database containing 178 variables on regulatory governance and content in 45 countries towards the end of 2001. Not all 45 respondents answered all questions, of course, meaning that the sample size for any given question is typically less than 45. Nonetheless, the survey provides detailed, consistent, comparable data at a level of detail not available before. Appendix 1 contains the survey instrument.

The survey asked a variety of questions on many aspects of governance and content. On governance, respondents provided information on the precise laws affecting the regulatory agency and regulations, as well as several measures of independence, transparency, accountability, capacity, and competency. On regulatory content, respondents provided information on licenses (wireline, wireless, and internet), interconnection, price regulation, and universal service obligations and funding mechanisms. Finally, the survey collected limited information on the state of the sector, including whether and when the incumbent was privatized, and the number of mobile, wireline, and Internet Service Provider licenses applied for, awarded, and active.

Consider, for example, regulatory independence. As discussed above, the survey included various questions on different aspects of independence. One measure of independence is how the regulatory agency is funded. An agency may be less independent if it relies on government allocations. Figure 1 shows how countries tend to finance their regulators. The data show that regulatory agencies tend to receive their budgets either entirely through fees or entirely from a government allocation.

Countries in the Telecom Regulators Survey	
Argentina	Jordan
Barbados	Kenya
Belize	Latvia
Bolivia	Malawi
Bosnia and Herzegovina	Malaysia
Brazil	Mexico
Bulgaria	Moldova
Chile	Mongolia
Colombia	Morocco
Costa Rica	Pakistan
Cote d'Ivoire	Panama
Czech Republic	Peru
Dominican Republic	Poland
Ecuador	Romania
El Salvador	Slovakia
Estonia	South Africa
Ghana	Sri Lanka
Greece	Tanzania
Guatemala	Thailand
Honduras	Turkey
Hungary	Uganda
India	Venezuela
Jamaica	

Table 2: Countries included **Figure 1: Regulatory budget from fees, telecommunications regulators**

Another measure of independence is the direct power the chief executive (typically, the president or prime minister) has over the regulator and regulations. Figure 2 reveals that in slightly more than half the sample countries the chief executive can fire the regulator, while in about 40 percent of the countries the executive can veto the regulators' decisions.

Figure 2: Regulatory independence

The survey also contains information on regulatory content. Countries commonly regulate prices, for example. Figure 3 reveals that nearly all countries regulate prices of fixed-line service, domestic long distance, and international calls. About 40 percent still regulate prices in mobile telephony.

Figure 3: Share of countries that regulate prices

These figures show merely a small snapshot of data available from the survey. These data, especially when combined with other, publicly-available, data on the telecommunications sector, should provide new insights into the interactions between regulation and sector performance.

5 The survey of electricity regulators

Electricity reforms have not proceeded as quickly as have telecommunications reforms. It proved more difficult to identify regulatory agencies and to elicit responses from the agencies we identified. Our survey of electricity regulators therefore has fewer observations than does the survey of telecommunications regulators. In the summer of 2001, we identified and contacted 46 regulators by email, fax, and regular mail. We followed up with faxes and telephone calls, and by April 2002 received 20 responses (Table 3). Breaking responses into their individual components yields a dataset of 20 observations and 374 variables. As in the telecommunications survey, not all regulators responded to all questions, so not all variables exist for each observation. Appendix 2 provides the complete questionnaire.

Countries in the Electricity Regulators Survey	
Albania	Hungary
Argentina	Indonesia
Armenia	Latvia
Chile	Malaysia
Colombia	Mexico
Costa Rica	Nicaragua
Czech Republic	Panamá
Dominican Republic	Poland
Ecuador	Singapore
El Salvador	South Africa

Table 3: Countries included in electricity survey

In addition to governance questions of the sort described above, we asked regulatory content questions tailored to the electricity sector. For example, the survey inquires about the state of unbundling of transmission, generation, and distribution. Questions regarding competition, too, are specific to the electricity sector, asking, for example, whether choice of electricity supplier is restricted to consumers of some minimum size – common in early stages of electricity reforms.

Consider the general structure of the industry. The survey asks whether the industry remains a vertically integrated monopoly, whether there is any wholesale competition, and whether supply and retail competition exists. Figure 4 shows that while only about one-quarter of the countries in the sample retain completely vertically-integrated electricity companies, competition is not especially advanced: slightly more than half allow wholesale competition, but only around 15 percent allow retail competition.

Figure 4: Electricity market structure

Figure 5: Share of countries that subsidize various consumer groups

Not only is consumption widely subsidized, prices are often regulated in various aspects of the sector, including transmission and distribution. Nearly all (18 of 20) responding countries have some form of price regulation in these areas. Figure 6 shows survey results regarding the type of regulation countries use to regulate transmission and distribution prices. Of the countries that regulate transmission prices, six use price caps, three use revenue caps, and five use rate of return. Of the countries that regulate distribution prices, nine use price caps, two use revenue caps, and five use rate of return regulation.

Like the telecommunications database, the survey data on electricity should provide new and unique insights into the interactions between regulations and the development of the electricity sector. While the sample of countries in the electricity database is smaller than the telecommunications database, consistent and detailed cross-country electricity data is especially scarce, increasing the value of the data despite the small sample.

Figure 6: Share of countries using various price control methods

6 Conclusion

The telecommunications and electricity regulation databases are the product of an effort to generate systematic, rigorous, cross-country data on regulations and regulatory agencies in developing countries. The figures presented here provide just a glimpse of the sort of information in the dataset. The myriad data should allow researchers to begin to explore how different types of regulatory governance and content interact with telecommunications and electricity reforms to affect the development of the industry. While these data do not approach the quality and quantity of data available for regulated industries in industrialized countries, they provide information at a level of detail and for a number of countries not available before. We hope these datasets can contribute substantively to the ongoing reforms of network industries and the debate surrounding the optimal structure of these industries.

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APPENDIX 1

Telecommunications Regulation Survey

This appendix consists of the letter requesting regulators' participation and the survey.

The data and codebooks are available here:

<http://www.aei-brookings.org/publications/abstract.php?pid=724>

The STATA version of the telecommunications data can be downloaded directly here:

<http://www.aei-brookings.org/files/telecomregs.dta>

An Excel version of the data is available here:

http://www.aei-brookings.org/files/telecom_reg_data.xls

<Regulator>

<Regulatory Authority>

<Address>

<Date>

Dear Sir,

We are researching the impact of the privatization and liberalization process in the telecommunications sector of emerging economies around the world, and your country has been included for this study.

We kindly request you to fill the attached questionnaire in order to build a database of various telecommunications indicators as part of the study. The questionnaire deals with the following topics:

1. Overall Sector Performance
2. Regulatory Framework
3. Market Structure
4. Licensing Procedure
5. Access and Interconnection Policies
6. Price Regulations
7. Dispute Resolution and Appeals
8. Universal Service Obligations

We would very much appreciate if you could send us the answers to the questionnaire to the above address, **Mail stop MC 3-300**. Since we are working towards a deadline your timely response would be really helpful. Thank you in advance for your cooperation on this matter.

Sincerely,

George Clarke
Economist
Development Research Group
Competition Policy and Regulation

Please **circle** the relevant answer(s) when there are multiple choices.

Section 1. Telecommunications Law.

1. Has parliament completely passed framework laws for the telecommunications sector?.....**Yes. Go to Q. 1.1**
No. Go to Section 2

- 1.1 Please list names, years of publication and numbers for all relevant laws, including general laws related to privatization or investment that affect the telecommunications sector.

1. _____
 2. _____
 3. _____
 4. _____

- 1.2 Does the law explicitly forbid operators from being issued licenses that allow them to provide more than one telecommunication service (such as fixed local telephony, domestic long distance, international long distance and cellular services)? **YesGo to Q. 1.4**

NoGo to Q. 1.3.

- 1.3 Is separate accounting for services compulsory?.....**Yes/No**

- 1.4 Does the Law allow the telecommunications sector to be privatized in part or in whole?.....**In Whole**
In Part
Not at all

Section 2. Regulatory Bodies

2. Has a regulatory body (RB) that is separate from the utility and from the communications ministry started work?..... Yes/No

Please list all regulatory bodies involved in regulating the telecommunications sector (including the ministry and/or incumbent if they are responsible for some areas of regulation) and the areas of regulation that they are responsible for.

Name	Responsibilities	Date of Creation
1. (main regulator)		
2.		
3.		
4.		
5.		

- 2.1 Does the main regulator have national jurisdiction? Yes/No
- 2.2 Is the main regulator multi-sectoral? Yes/No
- 2.3 Can the main regulator compel financial and performance information? Yes/No
- 2.4 Are financial and performance information publicly available? Yes/No
- 2.5 Does the regulator actually collect the following financial data?
- 2.5.1 Complete balance sheets from fixed wired operators? Yes/No
 - 2.5.2 Complete income statements from fixed wired operators? Yes/No
 - 2.5.3 Complete balance sheets from cellular operators? Yes/No
 - 2.5.4 Complete income statements from cellular operators? Yes/No
 - 2.5.5 Complete balance sheets from Internet Service Providers? Yes/No
 - 2.5.6 Complete income statements from Internet Service Providers? Yes/No
- 2.6 Does the regulator actually collect the following performance indicators?
- 2.6.1 Call completion rates by operator? Yes/No
 - 2.6.2 Faults/Fault Repair Times? Yes/No
 - 2.6.3 Geographical coverage rates? Yes/No
- 2.7 Approximately what share of the regulator's budget comes from.
- Government Budget _____
 - Levies on Companies/License Fees _____
 - Donors _____
 - Other (Please describe) _____
 - 100%

2.8 Is the regulatory body headed by a single person or by a group of people (e.g., a regulatory board)?

Single person

Multiple people

2.9 How many employees? _____

Of these:

2.9.1 How many technicians? _____

2.9.2 How many engineers? _____

2.9.3 How many accountants? _____

2.9.4 How many economists? _____

2.9.5 How many lawyers? _____

2.10 Who appoints the head of the regulatory body?

President Go to 2.11

Ministry Go to 2.11

Parliament Go to 2.12

Other (Specify) _____ Go to 2.12

2.11 If the president or Ministry appoints the head of the regulator body, is Parliamentary approval required? **Yes/No**

2.12 Is head appointed for a fixed term? **Yes Go to 2.12.1**

No Go to 2.13

2.12.1 For how long? _____

2.12.2 Can head be re-appointed? **Yes/No**

2.13 Who appoints the majority of the regulatory body's commissioners?

President Go to 2.14

Ministry Go to 2.14

Parliament Go to 2.15

Other (Specify) _____ Go to 2.15

2.14 If the president or Ministry appoints the commissioners, is Parliamentary approval required? **Yes/No**

2.15 Are commissioners appointed for fixed terms? **Yes Go to 2.15.1**

No Go to 2.16

2.15.1 For how long? _____

2.15.2 Can head be re-appointed? **Yes/No**

2.16 Can commissioners be fired? **Yes Go to Q 2.16.1**

No Go to 2.17

2.16.1 Can they be fired at the discretion of the executive? **Yes Go to Q 2.17**

No Go to Q 2.16.2.

- 2.16.2 Can they be fired for conflict of interest? Yes/No
- 2.16.3 Can they be fired for incompetence? Yes/No
- 2.16.4 Can they be fired for corruption? Yes/No
- 2.17 Can the Minister/President veto the regulator's decisions? Yes/No
- 2.18 Can the Minister/President issue written policy guidelines? Yes/No
- 2.19 Can the Minister/President issue verbal instructions to the regulator? Yes/No
- 2.20 Has the Minister/President issued any written policy guidelines in past year? Yes/No
- 2.21 Circle all groups who have the right to participate in regulatory proceedings:
 (a) Consumers? (b) Competitors?
 (c) Access Users? (d) others (please list) _____
- 2.22 Have regional regulatory bodies been created? Yes/No

Section 3. Restructuring

- 3.1 Has the incumbent been commercialized and corporatized? Yes/No
- 3.2 Is the incumbent responsible for providing postal services? Yes/No
- 3.3 Has the incumbent unbundled any other components (other than postal services)?
Yes/No
- 3.4 Is there any cross-ownership regulation in place? Yes/No
- 3.5 Has the incumbent been privatized? Yes/No

Section 4. Price Regulation

- 4.1 Are final-user prices regulated in the following businesses?
- 4.1.1 Fixed-line local telephony? Yes/No
- 4.1.2 Cellular telephony? Yes/No
- 4.1.3 Domestic long-distance? Yes/No
- 4.1.4 International long-distance? Yes/No
- 4.1.5 Internet Service providers? Yes/No
- 4.2 Who approves prices for each service. If there is more than one regulator, please list regulator by name.
- 4.2.1 Fixed-line local telephony? Regulator/Ministry/President/Parliament.
 Name of regulator _____ Other _____
- 4.2.2 Cellular telephony? Regulator/Ministry/President/Parliament.
 Name of regulator _____ Other _____

4.2.3 Domestic long-distance? **Regulator/Ministry/President/Parliament.**

Name of regulator _____ Other _____

4.2.4 International long-distance? **Regulator/Ministry/President/Parliament.**

Name of regulator _____ Other _____

4.2.5 Internet Service providers? **Regulator/Ministry/President/Parliament.**

Name of regulator _____ Other _____

4.3 How are prices regulated?

4.3.1 Fixed-wire local telephony?

Price Cap
 Rate of Return
 Global Price Cap
 None
 Other _____

4.3.2 Cellular telephony?

Price Cap
 Rate of Return
 Global Price Cap
 None
 Other _____

4.3.3 Domestic long-distance?

Price Cap
 Rate of Return
 Global Price Cap
 None
 Other _____

4.3.4 International long-distance?

Price Cap
 Rate of Return
 Global Price Cap
 None
 Other _____

4.3.5 Internet Service providers?

Price Cap
 Rate of Return
 Global Price Cap
 None
 Other _____

4.4. Is there a set period of time between regulator reviews?

Yes. Go to Q.4.5**No. Go to Q. 4.6.**

4.5. How long (in terms of years) is the period between reviews for the following services?

4.5.1 Fixed-line local telephony? _____

- 4.5.2 Cellular telephony? _____
- 4.5.3 Domestic long-distance? _____
- 4.5.4 International long-distance? _____
- 4.5.5 Internet Service providers? _____

4.6 Does the government subsidize the following services?

4.6.1 Service for low income consumers? **Yes/No**

4.6.2 Service for rural consumers? **Yes/No**

4.7 What percentage of subsidies comes from the following sources?

4.7.1 Budget _____%

4.7.2 Industry Levies _____%

4.7.3 Donors _____%

4.7.4 Other _____%
100%

Section 5. Interconnection Policies

5.1 Does the law require that all entrants receive the same technical terms and conditions for access/interconnection? **Yes/No**

5.2 Does the law require that all entrants receive the same prices for access/interconnection? **Yes/No**

5.3 How are access fees/interconnection rates set between the following operators?

5.3.1 Two fixed wired operators

Bilateral Negotiations

Regulator

Other, specify: _____

5.3.2 Incumbent local fixed wired-operator and a cellular operator

Bilateral Negotiations

Regulator

Other, specify: _____

5.3.3 Incumbent local fixed wired-operator and long-distance operator

Bilateral Negotiations

Regulator

Other, specify: _____

5.3.4 Two cellular companies

Bilateral Negotiations

Regulator

Other, specify: _____

5.3.5 Incumbent local fixed wired and an international operator

Bilateral Negotiations**Regulator****Other, specify:** _____

5.4 If **any** prices are set through bilateral negotiations is there a time limit for those operators to negotiate an agreement?

5.4.1 Two fixed wired operators **Yes/No**

5.4.1.1 If yes, how long? (in years) _____

5.4.2 Incumbent local fixed wired-operator and a cellular operator **Yes/No**

5.4.2.1 If yes, how long? _____

5.4.3 Incumbent local fixed wired-operator and long-distance operator **Yes/No**

5.4.3.1 If yes, how long? _____

5.4.4 Two cellular companies **Yes/No**

5.4.4.1 If yes, how long? _____

5.4.5 Incumbent local fixed wired and an international operator **Yes/No**

5.4.5.1 If yes, how long? _____

5.5 If the two operators can not agree interconnection/access terms, who intervenes to solve conflicts (if no one can intervene, enter NONE)? _____

Section 6: Licenses

6.1 Who decides how many licenses will be issued?

Regulator (Name _____)
 Ministry
 President
 Legislature
 Privatization Commission
 Other _____

6.2 Is there a formal procedure for granting licenses for the following areas?

6.2.1 Fixed-line local telephony? **Yes/No**

6.2.2 Cellular telephony? **Yes/No**

6.2.3 Domestic long-distance? **Yes/No**

6.2.4 International long-distance? **Yes/No**

6.2.5 Internet Service providers? **Yes/No**

6.3 If yes (for each area in q 6.2), is this procedure consistently followed?

6.3.1 Fixed-line local telephony? **Yes/No/No Experience**

6.3.2 Cellular telephony? **Yes/No/No Experience**

6.3.3 Domestic long-distance? **Yes/No/No Experience**

6.3.4 International long-distance? Yes/No/No Experience

6.3.5 Internet Service providers? Yes/No/No Experience

6.4 Who grant licenses for each area?

6.4.1 Fixed-line local telephony? Regulator (Name _____)

Ministry

President

Legislature

Privatization Commission

6.4.2 Cellular telephony? Regulator (Name _____)

Ministry

President

Legislature

Privatization Commission

6.4.3 Domestic long-distance? Regulator (Name _____)

Ministry

President

Legislature

Privatization Commission

6.4.4 International long-distance? Regulator (Name _____)

Ministry

President

Legislature

Privatization Commission

6.4.5 Internet Service providers? Regulator (Name _____)

Ministry

President

Legislature

Privatization Commission

6.5 For granting a license is there a mandatory bidding?

6.5.1 Fixed-line local telephony? Yes/No/No Experience

6.5.2 Cellular telephony? Yes/No/No Experience

6.5.3 Domestic long-distance? Yes/No/No Experience

6.5.4 International long-distance? Yes/No/No Experience

6.5.5 Internet Service providers? Yes/No/No Experience

6.6 Total number licenses in the following areas?

Area Approved Number Awarded Licenses Active Operators

Fixed-line Local _____

Domestic Long Distance _____

International _____

Cellular _____

Internet Service Providers _____

6.7 What approval do private network operators have to get to before they can start operating? **None** **Notification** **Formal Approval**

6.8 What approval do Internet Service Providers have to get before they can start operating? **None** **Notification** **Formal Approval**

6.9 What approval do equipment providers have to get before they can start operating? **None** **Notification** **Formal Approval**

6.10 Do equipment providers have to get prices approved? **Yes/No**

Section 7: Spectrum Use

7.1 Who assigns spectrum?
(Name _____)

Regulator

Ministry
President
Legislature

7.2 How is spectrum assigned?

Competitive Bidding
Fixed Price
No Experience
Other _____

Section 8: Regulatory Decisions

8 Can the operator appeal if disagrees with regulators decision? **Yes Go to 8.1**
No. Go to 8.3

8.1 Who can the operator appeal to in each instance? (that is, Ministry, Executive, Other executive body, Judiciary, Formal domestic arbitrator, Formal international arbitrator, no appeal)

8.1.1 First Instance _____

8.1.2 Second Instance _____

8.1.3 Third Instance _____

8.2 Can the operator appeal under the following circumstances

8.2.1 On a statutory basis? **Yes/No**

8.2.2 On an evidential basis? **Yes/No**

8.2.3 On a procedural basis? **Yes/No**

8.3 Can other parties appeal?

Yes Go to 8.4

No. Go to 8.6

8.4 Circle all other parties that can appeal

(a) Access Users (b) Competitors

(c) Consumers (d) Others _____

8.5 Can other parties appeal under the following circumstances

8.5.1 On a statutory basis? **Yes/No**

8.5.2 On an evidential basis? **Yes/No**

8.5.3 On a procedural basis? **Yes/No**

8.6 Are regulatory meetings open to the public in practice? **All**

Some

None

8.7 Are regulatory meetings required to be open to the public by law? **Yes/No**

8.8 Are regulatory decisions publicly available? **Yes/No**

8.9 Does regulator publish decisions in practice? **Yes/No**

8.9.1 If so, where? _____

8.10 Does the law REQUIRE the regulator to public decisions **Yes/No**

8.10.1 If so, where? _____

8.11 Does regulator publish explanations of decisions in practice? **Yes/No**

8.11.1 If so, where? _____

8.12 Does the law REQUIRE the regulator to publish explanations of decisions **Yes/No**

8.12.1 If so, where? _____

Section 9: Geographically Based Obligations

9 Does any operator have geography-based obligations? **Yes Go to Q 9.1**

No Go to End

9.1 Do any of the obliged operators have funding from special geographically-based obligations fund? **Yes/No**

9.2 Do all of the obligated operator have access to such funds? **Yes/No**

THANK YOU VERY MUCH FOR YOUR HELP

APPENDIX 2

Electricity Regulation Survey

This appendix consists of the letter requesting regulators' participation and the survey.

The data and codebooks are available here:

<http://www.aei-brookings.org/publications/abstract.php?pid=724>

The STATA version of the electricity data can be downloaded directly here:

<http://www.aei-brookings.org/files/electricregs.dta>

An Excel version of the data is available here:

http://www.aei-brookings.org/files/electricity_reg_data.xls

Dear Sir/Madame,

As part of our ongoing World Bank Policy Research Report on Infrastructure Regulation, we are conducting a survey of international experience with electricity sector reform. We would like to include your country in this study.

We kindly request you to take a few moments to fill in the attached questionnaire. Our survey covers the following topics:

1. Electricity Sector Characteristics
2. Sector Restructuring
3. Regulatory Framework
4. Regulatory Process/Decisions
5. Pricing Issues
6. Access Policies
7. Universal Service Obligations/Quality of Supply

Your participation in this survey will enhance the quality of the Report. This study will provide policy makers and electricity regulators with insight into effective approaches to regulation and reform based on the experience of a broad panel of countries. We would very much appreciate if you could send us your timely response by email or fax to:

Mr. Tooraj Jamasb or Mr. Takis Papapanagiotou

Tel: (202) 473 0451 Tel: (202) 473 5597

Fax: (202) 522 1155 Fax: (202) 522 1155

Email: tjamasb@worldbank.org Email: tpapanagiotou@worldbank.org

or alternatively mail to:

Competition Policy and Regulation Team
Development Research Group
Mail Stop MC 3-300,
The World Bank

1818 H Street NW
Washington, DC 20433, USA

We would welcome any additional material that you may find useful for the purpose of this study. If you have any questions please feel free to contact us.

Questionnaire for Electricity Regulators

Please circle or place a cross in front of the relevant answer(s) when there are multiple choices.

Section 1. Electricity Law

Has the parliament passed any framework laws aiming at reforming the electricity sector?

..... **Yes Go to 1.2**

No Go to Section 2

1.1 Please list names, years of publication and numbers for relevant laws, including laws related to privatization or investment that affect the electricity sector.

1. _____
2. _____
3. _____
4. _____
5. _____

When did the electricity sector reform actually start? (please enter year) _____

Does the law explicitly forbid operators from joint ownership of electricity services (such as generation, transmission, distribution, and retail/supply)?..... **Yes/No**

Does the law allow the entry of new private power companies?..... **Yes/No**

Does the law allow the electricity sector to be privatized in part or in whole?.....

2 = In Whole

1 = In Part

0 = Not at all

Section 2. Restructuring

Which of the following market models describes the power sector in your country?

..... **Vertically integrated monopoly**
Single buyer market
Wholesale competition
Supply/Retail competition

2.1 Please indicate the years the following reform measures were **first initiated** in your country:

Reform measures	Year
Regulator established	
Privatization	
Vertical separation	
Entry of new private power producers	
Wholesale power market (pool, contract, spot, etc.)	

2.2 Degree of vertical integration from generation to supply **2 = Unbundled**
0= Integrated
1= Mixed

2.3 Has transmission been separated from generation? **2 = Separate companies**
1 = Accounting separation
0 = Integrated

2.4 Are there vertical restrictions on joint ownership of generation and transmission facilities?
1 = Yes
0 = No

2.5 Are there horizontal restrictions on the maximum market share of generation and retail supply companies?..... **1 = Yes**
0 = No

2.6 Are there any constraints in the number of operators in Generation? **Yes/No**

2.7 Please fill in the following sector information:

		At the time of Reform Year: (In case of no reform please enter information 5 years ago)								Post-Reform Year: (In case of no reform please enter most recent information)							
		Number of Companies				% of Total MW				Number of Companies				% of Total MW			
		a	b	c	d	a	b	c	d	a	b	c	d	a	b	c	d
		Public	Minority Private	Majority Private	Private	Public	Minority Private	Majority Private	Private	Public	Minority Private	Majority Private	Private	Public	Minority Private	Majority Private	Private
G	Generation																
T	Transmission																
D	Distribution																
S	Supply																
	Total																

_____ = total number of generators at time of reform

_____ = total number of transmission companies at time of reform

_____ = total number of distribution companies generators at time of reform

_____ = total number of supply companies at time of reform

2.8 Have the public (e.g. central government, state-owned, municipal etc.) company(ies) been corporatized? **Yes/No**

2.9 Are consumers allowed to choose among electricity suppliers? **Yes/No**

2.10 Is there a customer size threshold (e.g. KW/KWh) for free consumer choice? **Yes/No**

2.11 Please provide the customer threshold(s) (in kW/kWh) for which consumers are free to choose among electricity producers/suppliers and the date this regulation(s) took (will take) effect:

Customer Type	Customer Size (kW/kWh)	% of Total Consumption	Date
	(a)	(b)	(c)
Industrial			
Commercial			
Residential			

Section 3. Regulatory Bodies

3.1 Has a regulatory body that is separate from the utilities and from the Ministry started to work?.....**Yes/No**

Please list all regulatory bodies involved in regulating/overseeing the electricity sector (including the ministry and/or incumbent if they are responsible for some areas of regulation) and the areas of regulation that they are responsible for.

Name	Responsibilities	Date of Creation
1. (main regulator)		
2.		
3.		
4.		
5.		

3.2 Does your agency oversee multiple sectors?.....**Yes/No**

3.2.1 If yes, which sectors?.....

3.3 How is the regulatory body financed? (% of regulator's budget)

Government Budget

Levies on Companies/License Fees

Customer levies

Other (Please describe) _____

3.4 Is the regulatory body headed by a single person or by a group of people (e.g., a regulatory board)?

Single person

Multiple people

3.5 How many employees does your agency occupy?

Of these:

3.5.1 How many technicians?

3.5.2 How many engineers?

3.5.3 How many accountants?

3.5.4 How many economists?

3.5.5 How many lawyers?

3.6 Who appoints the head and/or the commissioners of the regulatory body?

President

Ministry

Parliament

Other, specify _____

- 3.7 If the president or Ministry appoints the head and/or the commissioners of the regulator body, is Parliamentary approval required?.....**Yes/No**
- 3.8 Is head appointed for a fixed term? **Yes/No**
- 3.8.1 For how long? _____
- 3.8.2 Can head be re-appointed? **Yes/No**
- 3.8.3 Who has the authority to fire head/commissioners? (please mark all that apply) (a) President (b) Minister (c) Parliament (d) Others (please list)
- _____
- 3.8.4 For what reasons (e.g. incompetence, corruption, conflict of interest)?
- Please list: Conflict of Interest -----
- Incompetence-----
- Corruption-----
- 3.8.5 How many heads have been removed since your agency's creation?
- 3.9 Who can veto the regulator's decisions? **President**
- Minister**
- Court**
- Other**
- 3.10 Who can issue policy guidelines for the regulator? _____ = President
- _____ = Minister
- _____ = Parliament
- _____ = Regulator
- _____ = Other
- 3.11 Are the policy guidelines publicly available? **Yes/No**
- 3.12 Can the Minister/President give verbal instructions to the regulator? **Yes/No**
- 3.13 Have regional regulatory bodies been created? **Yes/No**

Section 4: Regulatory Process/Decisions

- 4.1 Can your agency compel financial and performance information from utilities?
- Yes/No**
- 4.1.1 Is there a standardized reporting format for financial/performance information?
- Yes/No**
- 4.1.2 Is the financial/performance information audited by:
- (a) Regulator (b) Independent auditors (c) Others (please list)
- _____
- 4.2 Does the regulator make financial and performance information publicly available?
- Yes/No**

4.3 Is there a consultation process prior to regulatory decisions? **Yes/No**

4.3.1 If so, what type?

- (a) Consultation papers (b) Hearings
(c) Meetings (d) Other (please list) _____

4.4 Please circle all groups who have the right to participate in regulatory proceedings:
(Study)

- (a) Consumer groups (b) Utilities
(c) Industry associations (d) Others (please list) _____

4.5 Can the utilities appeal if they disagree with regulator's decisions? **Yes/No**

4.6 Who can the utilities appeal to in each instance? (that is, Ministry, Executive, Other executive body, Judiciary, Formal domestic arbitrator, Formal international arbitrator, no appeal)

- 4.6.1 First instance
4.6.2 Second instance
4.6.3 Third instance

4.7 Can other parties appeal? **Yes/No**

4.8 Circle all other parties that can appeal:

- (a) Consumer groups (b) Utilities
(c) Industry associations (d) Others _____

4.9 Are regulatory meetings open to the public in practice? **Yes/No**

4.10 Are regulatory meetings required to be open to the public by law? **Yes/No**

4.11 Are regulatory decisions publicly available? **Yes/No**

4.12 Does the law REQUIRE the regulator to publish decisions **Yes/No**

4.13 If so, where?

4.14 Does the regulator publish decisions in practice? **Yes/No**

4.14.1 If so, where?

4.15 Does the law REQUIRE the regulator to publish explanations of decisions **Yes/No**

4.15.1 If so, where?

4.16 Does the regulator publish explanations of decisions in practice? **Yes/No**

4.16.1 If so, where?

Section 5. Price Regulation

5.1 Are the following end-user prices regulated?

- 5.1.1 Electricity prices for industry? **Yes/No**
5.1.2 Commercial electricity prices? **Yes/No**
5.1.3 Electricity prices for households? **Yes/No**

5.2 Please provide the following information about end-user price regulation (Please mark all that apply).

Prices	Regulator			Ministry			Parliament			Competitively Decided
	Monitors	Advises	Decides	Monitors	Advises	Decides	Monitors	Advises	Decides	
Industrial I										
Residential R										

5.3 Type of existing power market (Please mark all that apply):

- (a) Bilateral contracts (b) Spot market (c) Pool
(d) Forward market (e) Balancing market Other _____

5.3.1 Is participation in the wholesale markets mandatory? **Yes/No**

5.3.2 If so, in what type of market? _____

5.4 What is the price control method for:

5.4.1 Transmission? RC Revenue Cap
PC Price Cap
RR Rate of Return
None None
Other Other _____

5.4.2 Distribution? RC Revenue Cap
PC Price Cap
RR Rate of Return
None None
Other Other _____

5.5 How long (in terms of years) is the period between price reviews?.....

5.6 Does the government subsidize the use of specific generation fuels? **Yes/No**

- 5.6.1 If so, which?
(a) Natural Gas (b) Coal
(c) Oil (d) Renewables
(e) Other _____

5.7 Are prices for any consumer groups subsidized? **Yes/No**

- 5.7.1 If so, which prices?
(a) Residential (b) Commercial
(c) Industrial (d) Other _____

5.7.2 What percentage of subsidies comes from the following sources?

Government Budget _____ %
Industry Levies _____ %
Other (specify) _____ %
Internal X Subs _____
+100%

5.8 Please fill in the following information:

Average End-User Electricity Prices (In Local Currency Unit)				
T0 At the time of Reform Year: _____ (In case of no reform please enter information 5 years ago)			Post-Reform Year: _____ (In case of no reform please enter most recent information)	
	Residential	Industrial	Residential	Industrial
Generation				
Transmission				
Distribution				
Supply				
Total				

Section 6. Access/Interconnection Policies

6.1 Does the law require non-discriminatory access to transmission and distribution networks (Third Party Access TPA)?..... **Yes/No**

6.2 Does the law require that all entrants receive the same technical terms and conditions for access?..... **Yes/No**

6.3 Does the law require that all entrants receive the same prices for access? **Yes/No**

6.4 How are access fees/interconnection rates set between the generation and transmission/
distribution operators?

Negotiated TPA
Regulated TPA
Other (specify): _____

6.5 If operators cannot agree on access/interconnection terms/fees, who can intervene to resolve conflicts?.....

6.6 Is transmission access controlled by an independent system operator (ISO)? **Yes/No**

6.7 Is the transmission network operator required to extend the network to meet demand?
..... **Yes/No**

Section 7: Licenses

7.1 Is there a formal procedure for granting/renewing licenses for the following areas?

7.1.1 Generation? **Yes/No**

- 7.1.2 Transmission? Yes/No
 7.1.3 Distribution? Yes/No
 7.1.4 Retail Supply? Yes/No
 7.1.5 Imports? Yes/No
 7.1.6 Exports? Yes/No

7.2 Who approves licenses?

	Regulator	President	Ministry	Parliament	Other (please specify)
Generation					
Transmission					
Distribution					
Retail Supply					
Imports					
Exports					

7.3 Is there a mandatory bidding for granting licenses?

- 7.3.1 Generation? Yes/No/No Experience
 7.3.2 Transmission? Yes/No/No Experience
 7.3.3 Distribution? Yes/No/No Experience
 7.3.4 Retail Supply? Yes/No/No Experience
 7.3.5 Imports? Yes/No/No Experience
 7.3.6 Exports? Yes/No/No Experience

7.4 Can a license be revoked? Yes/No

- 7.4.1 If yes for what reason? _____

Section 8: Universal Service Obligations/Quality of Supply

8.1 Are utilities allowed to cut-off service for non-payment? Yes/No

8.2 Is there a clearly stated policy addressing issues such as:

- (a) Non-Payment/Credit problems (b) Cost of new connections
 (c) Support of low-income groups (d) Supply of rural customers
 (e) Non-discrimination among consumers Other _____

8.2 What are the bodies involved in protection consumer interests? (please mark all that apply)

- (a) Independent interest/consumer groups (b) Regulator
 (c) Other government agencies Others _____

8.3 Are there well-defined targets or minimum standards for quality of service (e.g. number of interruptions, minutes lost per customer, SAIFI, SAIDI, etc)?.....
Yes/No

- 8.3.1 If so, are there well-defined penalty schemes for non-compliance? Yes/No

8.3.2 Have there been any quality of service improvements after reform? **Yes/No**

If yes, please describe improvements: _____

8.4 Number of connections/customers: _____

8.5 Please enter the following information:

Degree of Electrification (e.g. % of population, % of households)			
At the time of Reform (In case of no reform please enter information 5 years ago)		Post-Reform (In case of no reform please enter most recent information)	
% (specify indicator)	Year	% (specify indicator)	Year

Section 9: Sector Characteristics

9.1 Please fill in the following sector information:

Resource Base (Generation)		
	At the time of Reform Year: (In case of no reform please enter information 5 years ago)	Post-Reform Year: (In case of no reform please enter most recent information)
Generation Type	Installed Capacity in MW	Installed Capacity in MW
Oil		
Coal		
Natural Gas		
Hydro		
Nuclear		
Other		

9.2 System Losses:

Transmission/Distribution Losses			
At the time of Reform (In case of no reform please enter information 5 years ago)		Post-Reform (In case of no reform enter current information)	
(MWh)	Year	(MWh)	Year

+ Shr = Percentage

_____ = trans losses _____ = pct losses trans
 _____ = dist. losses _____ = pct losses dist
 9.2 Please fill in the following tables:

	Number of full-time sector employees		MWh (Generated, transmitted, distributed, sold)	
	At the time of Reform Year: (In case of no reform please enter information 5 years ago)	Post-Reform Year: (In case of no reform please enter most recent information)	At the time of Reform Year: (In case of no reform please enter information 5 years ago)	Post-Reform Year: (In case of no reform please enter most recent information)
Generation				
Transmission				
Distribution				
Supply				
Total				

	Generation			Retail Supply		
Companies	Market Share (%)	Ownership (State-owned, minority private, majority private, private)	Status	Market Share (%)	Ownership (State-owned, minority private, majority private, private)	Status
Largest						
Second Largest						
Third Largest						

Comments:

THANK YOU VERY MUCH FOR YOUR HELP