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Assessing the Governance of Electricity Regulatory Agencies in the Latin American and Caribbean Region:

A Benchmarking Analysis

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Abstract

This paper focuses on an evaluation and benchmarking of the governance of regulatory agencies in the electricity sector in Latin American Countries (LAC). Using a unique database, the authors develop an index of regulatory governance and rank all the agencies in the LAC countries. The index is an aggregate number of the evaluation of four key governance characteristics: autonomy, transparency, accountability, and regulatory tools, including not only formal aspects of regulation but also indicators related to actual implementation. Based on 18 different indexes, the authors analyze the positions of agencies with regard to different aspects of their regulatory governance, considering not only performance in each variable but also scores in the different components of each category. This evaluation allows for the identification of particular country shortcomings regarding governance, and indicates needed improvements. Although the region shows an overall good governance design of their regulatory agencies, the implementation of the independent regulator model still faces several challenges. This is particularly evident in political autonomy and in the informal aspects of governance, where the region shows the largest number of countries with the lowest scores. Trinidad and Tobago and Brazil show the best results and Ecuador, Honduras, and Chile the poorest performances. The rest of the countries vary according to the different indexes. The authors give each governance variable equal weights and positively test the robustness of our approach using Principal Component Analysis.

This paper—a product of the Sustainable Development Department in the Latin America and the Caribbean Region—is part of a larger effort in the department to understand the determinants for performance in the infrastructure sectors. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The authors may be contacted at landres@worldbank.org, jguasch@worldbank.org, mdiop2@worldbank.org, and slopezazumendi@worldbank.org.

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Produced by the Research Support Team

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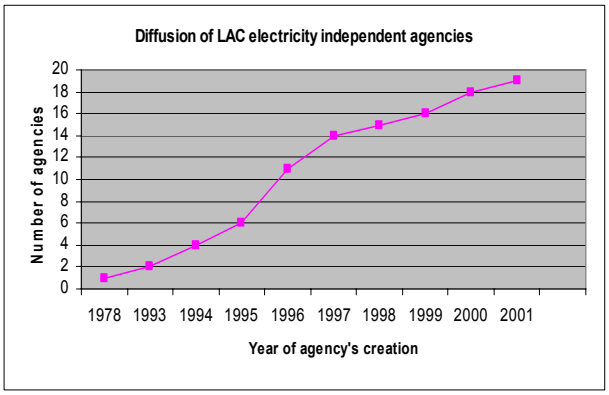
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The findings, interpretations and conclusions expressed herein do not necessarily reflect the views of the Board of the Executive Directors of the World Bank or the governments they represent. Correspondent author jguasch@worldbank.org.

1. INTRODUCTION:

According to an increasing body of empirical evidence, institutions matter for growth and development (Aron, 2000; Rodrik, 2004). The infrastructure sector generally, and the electricity sector in particular, are not an exception to this finding. Several research projects on the subject have associated better sector performance, represented by higher levels of electricity generation per capita, to the governance of institutions responsible for the conduct of regulatory decisions (Cubin and Stern, 2005).[1]

Although there have been different institutional arrangements established to implement regulatory policies, a separate agency from the government with reasonable levels of autonomy and technical expertise has emerged as the paradigm of a regulatory institution. In fact, this has been the case in the Latin American and the Caribbean (LAC) region. Beginning with Chile's National Energy Commission in 1978 and ending in 2001 with Barbados' Fair Trading Commission, today 70 percent of countries in the region have a separate entity—with varying degrees of independence—to regulate electricity markets (LAC Electricity Regulatory Governance Database, The World Bank, 2007)

Figure 1: Diffusion of LAC electricity independent agencies



Source: LAC Electricity Regulatory Governance Database, 2007. The World Bank. 2007

Even though it has been more than 10 years since the majority of LAC countries established independent agencies, the study of their governance has been limited and poorly focused. With some exceptions (Correa et al, 2006; Brown et al, 2007; Guasch and Spiller, 1999), the research on the subject has limited the assessment of regulatory agencies to a few governance indicators, specifically focusing on their independence from political authorities. This is particularly the case of the electricity sector of the LAC region where, beyond specific agency-based studies, regional analyses that assess institutional design and governance behavior do not exist.

In this paper we attempt to fill that gap by focusing on the regulatory governance of independent agencies in the electricity sector of LAC. We define regulatory governance as the agency's

[1] There is no one single factor that is unidirectional in its link to the performance of the electricity sector. Service quality, the final goal of electric infrastructure, is the result of the interaction of several factors such as the management of utilities (both private and public), the quality of regulation, the formulation of the energy policies by the government, the country's institutional endowments, and macroeconomic determinants. In this context, we are currently in the process of assessing the weight and influence of these factors in the quality of electricity services. This paper will be the basis for assessing the role of regulatory governance on sector performance (through the combination of our database with info collected at the company level).

institutional design and structure that allows it to carry its functions as an independent regulator. Based on selected literature on the subject, we define and assess electricity's agencies governance through four main characteristics: 1) autonomy from political authorities and of their management and regulatory competencies; 2) transparency before institutional and non-institutional stakeholders; 3) accountability to the three branches of government (Executive, Legislative, and Judiciary); and 4) tools and capacities for the conduct of the regulatory policy and the improvement of its institutional development.

Our assessment of the governance of regulatory agencies is based on the regulatory and institutional inputs agencies need to implement their procedures and tools and does not consider the outputs or outcomes of agencies' regulation.[2] In other words, our measurement of agencies' governance is not an indicator of the effectiveness of the use of their regulatory instruments (such as the methodology to calculate tariff readjustment) or the quality of stakeholders' involvement in public consultations. It is aimed at capturing the institutional conditions necessary to achieve good regulation regardless of their scope and impact on the sector's performance (Correa *et al*, 2006). Although we consider some practices (informal regulation) of agencies' governance, these indicators are referred to the operationalization of particular aspects of agencies' governance but do not reflect their full effectiveness. For instance, although we asked agencies whether they met their obligation in preparing an annual report of their activities (formal regulation) and their actual publication and means of publicizing it (informal regulation), this indicator does not imply that the report is well written and comprehensive. Similarly, although we use the number of Board directors that have left their positions due to resignation or dismissal as a proxy for agency's independence from political authorities, this is not a judgment on the full independence of the agency from the Executive. Moreover, the undue influence of political authorities may be exerted by no visible (and most importantly not subject to be reflected in a survey) de facto mechanisms.

The final goal is to benchmark the electricity regulatory agencies of the region based on the quality of their regulatory governance, which is given by the presence of selected procedures and tools. The benchmark model through which regulatory agencies are assessed is an "independent regulatory agency" with political and technical autonomy from government authorities and adequate mechanisms for achieving a transparent resource management and accountability. Our benchmarking tools are 18 indexes that measure different aspects of agencies' governance.

Data was collected through a survey submitted by nineteen electricity regulators of the region (Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Peru, Trinidad and Tobago, and Uruguay) composed of 97 questions related to the characteristics of the country's electricity markets and the agency's governance design (See Appendix 2).

A potential criticism of this research is that the data has been self-reported by the agencies. Although this might affect the impartiality and veracity of some responses, several factors allow us to still consider this approach sufficiently robust. First, the majority of the questions are related to legal provisions or factual circumstances with little space for subjective interpretations. Second, in the few cases of questions that are subject to agencies' interpretations, biased answers should not

[2] This has been the overwhelming mechanism used by the literature on the subject to assess the independence and other attributes of regulatory agencies. Although, ideally, we would like to include the effectiveness of the different institutional arrangements on sector performance and on institutional quality outcomes, the cross-regional nature of our research and the limited resources to undertake this task convinced us of this approach as the most convenient.

affect the overall ranking as the degree of subjectivity is the same for all respondents. Third, the majority, if not all, of the research on the subject has also used self-reporting to address regulatory design in independent agencies, as it's the most cost-effective method (particularly in the case of regional studies like ours). Finally, we have included a considerable number of indicators that minimize the impact of particular wrong or biased answers.

The paper is divided in four main sections. Next section is a review of the literature on institutional design of independent agencies. It presents the main research on the subject and identifies its strengths and weaknesses. Section 3 presents the methodology of this paper, describing the benchmark model, theoretical framework, levels of analysis, and indexes used to measure agencies' governance. Section 4 assesses the regulatory governance of LAC electricity regulatory agencies. The assessment is done through the characterization of agencies' governance at the regional, country, and variable levels. Section 5 includes a robustness analysis in which we explore two alternative approaches and show the consistency with the main findings. Section 5, and the final section of the paper presents the authors' conclusions.

The paper….

Will:

- Address the governance design and practices of regulatory agencies in terms of their autonomy, transparency, accountability, and tools
- Assess how far/close are LAC countries from the independent regulator model in the electricity sector
- Fill an existing gap in the literature of the governance of regulatory agencies in the Latin America and the Caribbean region

Will not:

- Relate agencies' governance to sector performance (service quality, labor productivity, etc). Although, after collecting data on the performance of private and public companies in the electricity distribution sector, we are currently assessing this relationship
- Establish a relationship between an agency's institutional design and its governance effectiveness. Although we have several indicators of regulatory practices (related to the implementation of the agencies' procedures and tools) they were included to reflect the operationalization of agencies' governance variables and not to be used to make a judgment of their full effectiveness.

2. LITERATURE REVIEW:

The different studies that have assessed regulatory agencies in the infrastructure sector have considered the United States (US) model of the independent commission as their benchmark of comparison and analysis. An institutional design model that emphasizes agencies that make decisions independently from the Executive branch, are subject to the accountability of the Parliament, and have budgeting autonomy that has emerged as the paradigm of an infrastructure regulator.

The first attempts to evaluate infrastructure regulatory agencies made use of frameworks to assess the independence of Central Banks (Stern and Cubbin, 2005; Oliverira, Machado, Novaes, and Ferreira, 2005). This explains the original emphasis on agencies' independence and the reduced significance given to other aspects of their functioning such as accountability and transparency. The evolution of the subject and the initial stages of agencies' functioning changed the original approach and introduced more comprehensive strategies to assessment.

The literature has dealt in both ways with the design of regulatory agencies: by focusing only on independence and by considering other variables of agencies' functioning, namely accountability and transparency. A third approach (Organization for Economic Cooperation and Development [OECD], 1997) involves the consideration of mechanisms to achieve high quality regulation (for instance, the use of Regulatory Impact Analysis) regardless of the sector and the agency's design. The following paragraphs summarize the different methodologies that have been used to assess the governance of independent regulatory agencies.

Johannsen (2003) measures the formal independence of energy regulators in eight European countries (Austria, Greece, Ireland, Italy, Luxembourg, Northern Ireland, and Spain). Using information collected through surveys, she assesses the independence of energy regulatory agencies through four main variables: a) independence from government, b) independence from stakeholders, c) independence in the decision-making process, and d) organizational autonomy. The survey's questions reflect formal regulation with no consideration for the practices of regulatory agencies. The energy regulator in Italy proves to be the organization with the largest degree of independence, followed by Ireland and Northern Ireland, respectively. Spain and Luxembourg are the countries with the lowest scores. The paper concludes by highlighting the differences between the theoretical concepts of regulatory independence and the actual design of independent regulators. According to Johannsen, the regulatory power of independent authorities can be very weak, reflecting the fact that the main emphasis has been on creating independent bodies rather than independent regulation. Furthermore, she suggests the need to refocus the discussion of independent regulators, emphasizing their actual activities rather than theoretical design.

Gilardi (2002) develops an independence index, covering regulators from five sectors in seven European countries (Belgium, France, Germany, Italy, the Netherlands, Sweden, and the United Kingdom). The author attempts to prove that governments delegate their regulatory powers and competences to independent regulatory agencies to enhance the credibility of their policies. The independence index focuses on formal independence and is divided into five components: a) the status of the head of the agency; b) the management board members' status; c) the general nature of the relationships with the government and the parliament; d) the degree of financial and organizational autonomy; and e) the extent of delegated regulatory competencies. The paper concludes by confirming the "credibility theory" and stressing the positive impact of the economic nature of regulation (as opposed to social regulation) and of low veto players on delegation. In other

words, in sectors subject to economic regulation (such as utilities) and where veto players are few, there is more delegation to regulatory authorities.

In another article (Gilardi, 2005), the same author proposes three ways of evaluating independent regulators. Considering our interest in the governance of regulatory agencies, we focus on two of the three mechanisms suggested by Gilardi to evaluate regulators: the impact of an agency's independence on regulatory quality and an agency's respect for accountability standards. The third approach, the impact of agency's independence on the performance of the market it regulates, is not considered in this literature review.

Gilardi (2005) correlates independence to regulatory quality through econometric analysis, where the dependent variable is a measure of regulatory quality and the main independent variable is a measure of the relevant characteristic of the regulator, namely independence. The concept of regulatory quality was developed by the OECD and refers to procedural requirements aimed at improving the quality of regulations. These requirements are built around 10 elements: the definition of the problem, the assessment of the justification for government action, its form and level, the legal basis for regulation, a cost-benefit analysis of issuing new procedures, the transparency of distributive effects, the clarity and accessibility of regulation, the openness of the decision-making process, and compliance mechanisms. Gilardi also uses a second method of evaluating independent regulators: an "accountability assessment" that helps to determine whether transparency standards are met. Based on the literature on Central Banks' independence and transparency, the paper selects five main dimensions of transparency: a) political transparency (openness of policy objectives); b) economic transparency (economic information used for policy such as data, models, etc); c) procedural transparency (how policy decisions are made); d) policy transparency (announcements and explanations of policy decisions); and e) operational transparency (implementation of policy decisions).

Gutierrez (2003) develops a Regulatory Framework Index (RFI) to asses the evolution of regulatory governance in the telecommunications sector during the period 1980–2001 in 25 LAC countries. The index is composed of three main aspects: a) the scope of the legal mandate that creates the institution (whether it is a law, decree, or other inferior law); b) the separation of regulatory activities between the regulators and the service provider; and c) characteristics of the regulatory institution: autonomy (financial and budgetary independence and no free removal of commissioners); accountability (right to appeal the agency's decisions and the power of the agency to resolve disputes between authorities and operators); clarity of roles (measured by the regulatory body's ability to impose fines and set tariffs); and transparency (measured by the existence of hearings for the setting of tariffs and other issues). According to Gutierrez, the RFI shows that most countries embraced strong regulatory reforms along the lines recommended by experts and practitioners.

Stern and Holder (1999) develop a framework to assess the governance of economic regulators in several sectors (electricity, natural gas, telecom, transport, and water) in six developing Asian economies (Bangladesh, India, Indonesia, Malaysia, Pakistan, and the Philippines). Their appraisal scheme is composed of two variables related to the formal (institutional design) and informal (regulatory processes and practices) aspects of regulation. The first variable contains the following components: clarity of roles and objectives, autonomy, and accountability. The second variable includes participation, transparency, and predictability. Results indicate middle-low levels of regulatory governance for all the sectors and countries included in the research. Moreover, results are relatively uniform by country across the industries, with the exception of India.

In addition to Stern and Holder's attempt to measure informal regulation, Magetti develops a framework to assess the real independence of regulatory agencies. His framework is composed of two main features: 1) the degree of self-determination of agencies' preferences and 2) the degree to which those preferences are translated into regulatory acts. The first feature is assessed through the measurement of the agency's independence from both government authorities and the utilities it regulates. Indicators used to measure the agency's independence from government authorities are: a) autonomy of low-level employees (need for collaboration with experts from the public administration); b) autonomy of resources; c) autonomy of board members (influence of partisan membership on nominations); and d) the vulnerability of the board (measured by how the substitution rate and political changes correlate with the frequency of early departures of board members). Indicators that measure the independence of the agency from those it regulates are composed of a) and b) above, as well as a third indicator related to conflict of interest (*e.g.*, business connections, family ties). The second feature is measured through the degree of influence of relevant actors on legislative processes that define or redefine the competencies of the agencies. Its main purpose is to determine how much new laws integrate the agency's point of view. He applies his approach to the Swiss Federal Banking Commission (SFBC), finding that the SFBC has higher levels of informal independence from political authorities than from the regulatees. With regards to the degree of influence of relevant actors on the legislative process, Magetti finds the informal independence of the SFBC to be quite low, particularly vis-à-vis political decision makers.

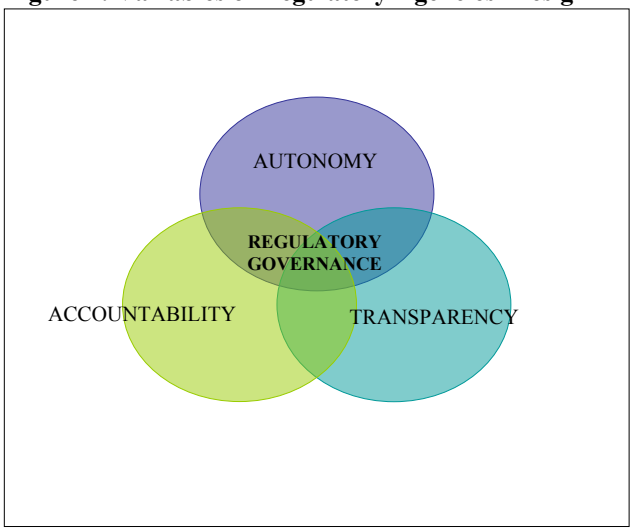
Two comprehensive approaches to assessing the governance of regulatory agencies have been those developed by Correa *et al.* (2006) and Brown *et al.* (2006). Correa *et al*. provide a detailed analysis of Brazilian regulatory agencies. The authors select four aspects of agencies' governance and, based on information collected through surveys, construct three indexes. Selected governance variables are a) autonomy (political and financial autonomy and the degree of delegation); b) decision-making (degree to which administrative procedures are adopted and reflect respect for due process, rule of law, transparency, and stakeholder participation); c) decision tools (legal means to collect information, appropriate budget to manage and process this information, qualified personnel and regulatory tools); and d) accountability (appeals mechanisms, role of oversight institutions, and transparency of regulations and procedures). Agencies' governance is measured through three indexes. The first index, the Regulatory Governance Index, is the base-line indicator and represents the most comprehensive dataset of all the indexes. The second index, the Parsimonious Index, captures those variables of the survey that are less subjective. The third index, the Facto Index, is related to actual practices of regulatory agencies. The report finds that independence and accountability are more developed than regulatory means and instruments (particularly qualified personnel and regulatory tools) and decision-making procedures (particularly with respect to those mechanisms that can guarantee consistency of decisions and reduce arbitrariness). It also finds that there is a clear difference between federal and state regulatory agencies, with the former achieving higher results in the autonomy, decision-making, and decision tools components of the Regulatory Governance Index.

Brown *et al.* (2006) develop a framework to assess the effectiveness of a regulatory system. They aim to provide the policy-maker with different types of evaluations (quick, mid-level, and in-depth) to carry out these assessments. The authors include aspects related not only to the governance of the regulatory system (independence, transparency, and accountability of the regulator) but also to the substance or content of the regulation (decisions about tariff levels and structures, network access conditions for new and existing customers). Using the independent regulator model as the benchmark of analysis, they select 10 principles that should be followed in order to create an independent regulatory agency. The principles are: independence (freedom to make decisions within their scope of authority without having to obtain prior approval from other officials or

agencies of the government); accountability (appeals, reporting obligations, oversight of performance, ethical procedures); transparency and public participation (requirements for regulations and rule-making procedures to be transparent and open to the public); predictability (processes for the implementation of agencies' regulations and decisions); clarity of roles (within the agency, between the agency and other agencies, and between the agency and the government); proportionality (relationship between the objective of regulations and the mechanisms/means for their implementation); requisite powers agencies should posses to perform their mission (*e.g.* tariff setting, regulation of service quality); appropriate institutional characteristics (*e.g.* collective decision-making, training for employees, budgetary independence and adequacy); and integrity (ethics provisions). The principles are accompanied by standards that establish the details for their implementation.

The literature on the governance of independent regulatory agencies has focused on three main aspects of their design: a) their independence from political authorities and the autonomy of their management; b) mechanisms to make them accountable (both to other branches of government and to the public); and c) the transparency of both their rule and decision-making procedures. Within these categories, indicators range from simple measures to determine, for instance, independence (such as the legal instruments that created the agency) to more sophisticated mechanisms aimed, for example, at improving the quality of regulation (such as Regulatory Impact Analysis).

Figure 2: Variables of Regulatory Agencies' Design



Research on the regulatory governance of independent agencies has evolved and changed. Despite the original focus on independence (influenced by the literature on Central Banks' independence), a growing body of literature has been using more comprehensive approaches to address institutional design. Good examples of this trend are the works of Correa *et al*. (2006) and Brown *et al.* (2006), which approach the assessment of independent regulatory agencies through the classic lens of autonomy, transparency, and accountability, but include a wide array of indicators within these variables as well as innovative tools to understand and assess their functioning. Furthermore, this literature focuses not only on the formal aspects of regulation (provisions existing in agencies' statues and laws) but also on informal regulation (aspects related to the implementation of the provisions' components).

This approach is useful as it recognizes the broad nature of the role of regulatory agencies: they are institutions responsible for driving investment in infrastructure, but also are decentralized administrative bodies in charge as such of delivering public services to citizens.

In this paper, we propose a framework identified with more comprehensive approaches to assess the governance of electricity independent agencies. The next sections of the paper present the methodology, assessment, and conclusions of our study.

3. METHODOLOGY:

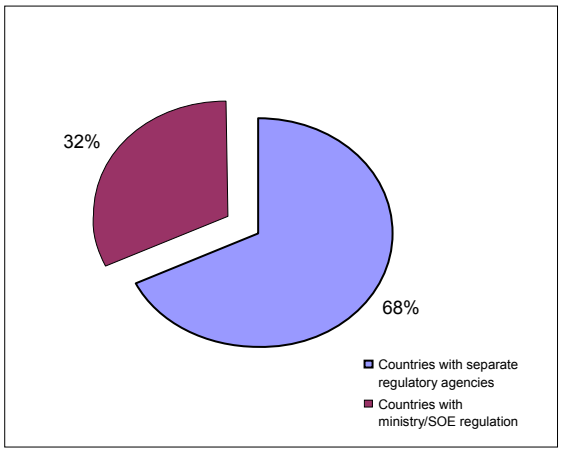
This paper assesses the regulatory governance of electricity independent agencies in LAC region. In order to do that, we selected a theoretical framework of analysis and designed a survey that was completed by nineteen countries of the region (Trinidad and Tobago, Peru, Mexico, El Salvador, Colombia, Brazil, Bolivia, Nicaragua, Costa Rica, Panama, Guatemala, Ecuador, the Dominican Republic, Argentina, Jamaica, Honduras, Chile, and Uruguay). The evaluation of agencies' governance was done through several indexes that reflect different dimensions of agencies' organization and functioning.

Following Correa *et al.* (2006) and the majority of the research on the subject, we measure only electricity agencies' governance structure and the implementation of some components and do not assess the impact of agencies' decisions on regulatory outcomes, despite the consideration of agencies' practices in our Electricity Regulatory Governance Index. In other words, we do not measure the impact of agencies' governance on the performance of the sector or the quality of their regulations.

3.1 The benchmark model of analysis:

We assess electricity regulatory agencies using the independent regulator model as our benchmark of analysis. This decision was based on two main factors. The first factor is related to the use of independent regulatory agencies as the model for electricity regulation in the majority of the region. According to our database,[3] almost 70 percent of the countries in the region have adopted a separate regulator from the line ministry as the preferred institutional arrangement for electricity regulation. The second factor is related to empirical evidence that considers the independent regulator model as the most effective approach in the regulation of privatized infrastructure industries (Brown *et al*., 2006).

Figure 3: Countries with separate electricity regulator in LAC



Source: LAC Electricity Regulatory Governance Database. The World Bank. 2007.

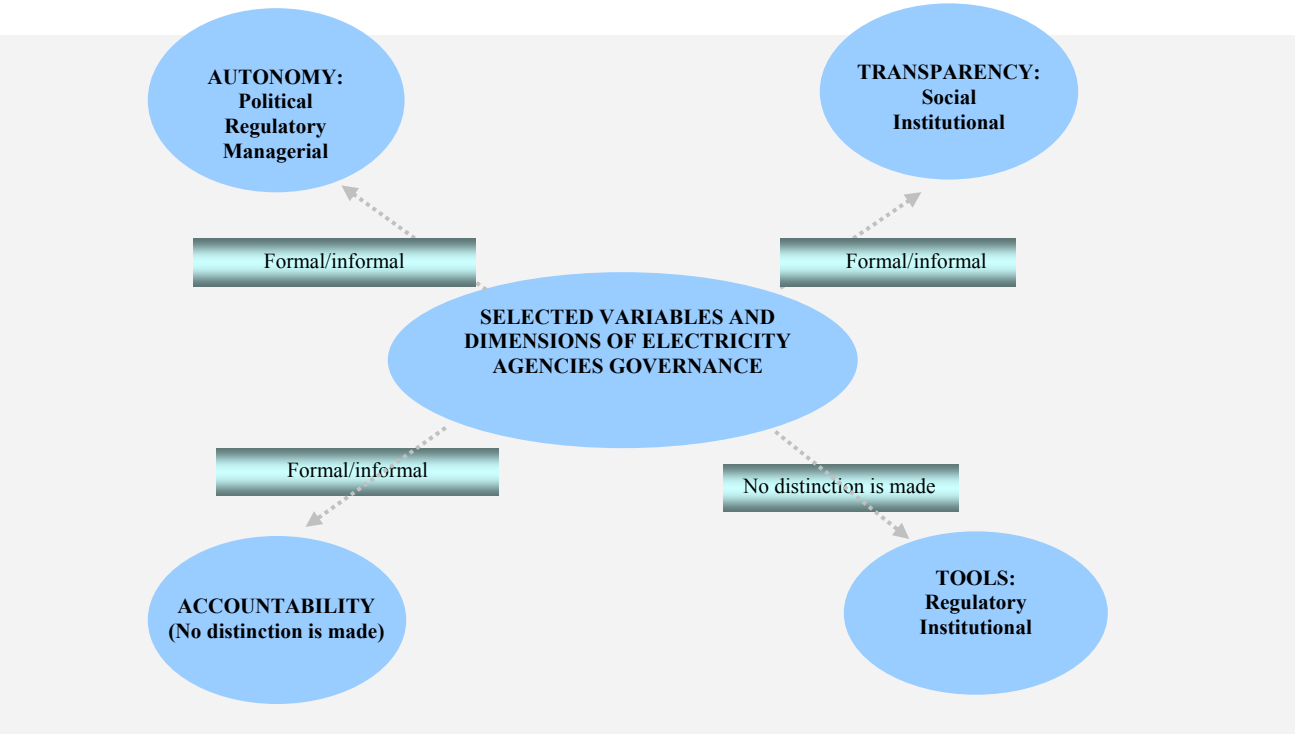
3.2 Theoretical framework:

We conceive regulatory agencies as both public bodies that are part of the public administration—and as such in charge of the delivery of public services—and as instruments to implement regulatory policies. This approach to assessing electricity agencies' governance led us to consider not only existing research on infrastructure agencies' designs (documented in the literature review), but also notions and tools of public sector governance applied to decentralized structures of government.

[3] Based on the information collected through the surveys submitted by countries, we designed a database composed of 46 electricity regulators (including both federal and national regulators). This paper analyzes the governance of national electricity regulatory agencies and does not include agencies at the state level.

Figure 4 represents the selected framework to assess the governance of independent regulatory agencies in the electricity sector of LAC. The regulatory governance of independent agencies is defined and assessed according to four variables of their design and functioning: autonomy, transparency, accountability, and tools. Each of the variables, with the exception of accountability, is composed of several elements, reflecting different aspects of autonomy, transparency, and tools. We consider only an institutional perspective of accountability as defined by the relationships of the agency with the Executive, Legislative, and Judiciary branches of government. Autonomy is divided into political, managerial, and regulatory autonomy; transparency, into social and institutional transparency; and tools are divided into regulatory and institutional tools.

Figure 4: The Assessment Framework



Variables for agencies' governance reflect not only formal aspects (procedures and tools established in the agency's statute or laws) but also the practices that derive from their implementation (informal regulation). Indicators for the informal elements of autonomy, accountability, and transparency represent the operationalization of some aspects of these variables. The variable "tools" is excluded from this analysis as the mere existence of these instruments implies their actual implementation.

The first variable of agencies' regulatory governance is **autonomy**. We define autonomy as the procedures, mechanisms, and instruments aimed at guaranteeing the independence of the agency from political authorities (political autonomy), the autonomous management of its resources (managerial autonomy), and the regulation of the sector (regulatory autonomy). Political autonomy represents the level of independence of the agency from government authorities and is measured by indicators that reflect the autonomy of the agency's decision-making. Managerial autonomy involves the freedom of the agency to determine the administration of its resources and is measured by indicators that reflect the powers of the agency to determine its organizational structure and the

use of its budget. Regulatory autonomy is defined by the extension of the agency's regulatory powers in the electricity sector and is represented by indicators that capture agencies' responsibilities in electricity regulation.

The second aspect of agency's governance is **accountability,** which we define as the procedures, mechanisms, and instruments aimed at guaranteeing an adequate level of control of the agency's budget and performance by political authorities, namely the Parliament. Despite the successful use of mechanisms to assess the performance of agencies by governments, we prioritize the accountability of the agency before the Parliament. We based this decision on two main reasons: First, the fact that the institutional design model we follow is that of a US independent commission, where agencies are subject to parliamentary oversight. Second, the history of political interference of LAC line ministries in utilities underscores the importance of including other political stakeholders, such as the Parliament, in the regulatory process. We consider an institutional perspective of accountability only as defined by the relationships of the agency with the three branches of government (Executive, Legislative and the Judiciary) and do not further dissect the variable.

The third variable is transparency. We define **transparency** as the procedures, mechanisms, and instruments aimed at guaranteeing the disclosure and publication of relevant regulatory and institutional information, the participation of stakeholders in the agency's regulatory decisions and decision-making, and the application of rules aimed at governing the integrity and behavior of agency officials. We cover two dimensions of transparency: social transparency and institutional transparency. **Social transparency** is composed of indicators related to the involvement of non-institutional actors in the agency's policy-making, including their access to the agency's information. **Institutional transparency** is composed of indicators related to the transparent management of the agency that are not directly linked to stakeholder involvement, and includes issues such as the publication of the agency's annual report, the use of norms of ethics, and the existence of public exams for hiring employees.

The fourth variable is **tools**, which we define as the instruments and mechanisms that contribute to the strengthening of different aspects of an agency's functioning and the quality of its regulations. We include not only **regulatory tools** (*e.g.* mechanisms for tariff revision, regulatory accountability, instruments for monitoring technical standards), but also those instruments aimed at improving the institutional quality of the agency, or **institutional tools** (*e.g.* audits of agencies' accounts, electronic files for consumer complaints, performance-based payments for employees, regulatory quality standards). This is the only variable whose analysis does not consider its formal and informal aspects; the sole existence of agencies' tools implies their actual implementation.

3.3 The survey:

In order to assess the governance of electricity regulators in LAC, we designed a survey that was distributed to all electricity regulatory agencies in the region, including not only national but also provincial or state regulators (particularly in the cases of Argentina and Brazil). All LAC countries that are members of the World Bank Group and have an electricity regulatory agency were included.

We received responses from 43 electricity regulatory agencies, whose coverage in terms of electricity consumers exceeds 90 percent of the region. Despite the high number of responses, due to time and methodological constraints we limited our research to national electricity regulatory

agencies, and excluded provincial regulators. Each country was represented by its own regulatory agency, with the exception of Colombia and Chile, for which we assigned unique values since they each have two different agencies with regulatory functions.

In both Colombia and Chile, regulatory responsibilities are shared between a National Energy Commission in charge of the main regulatory aspects (tariffs, approval of contracts) and an Oversight Electricity Agency (in the case of Chile, the *Superintendencia de Electricidad y Combustibles* and in the case of Colombia, the *Superintendencia de Servicios Públicos*) in charge of the sector's oversight (service quality, sanctions' enforcing, consumer complaints). Considering that both agencies perform different tasks that in other countries are undertaken by only one regulator, we "merged" both administrative bodies and assigned a unique value for the country. For those institutional aspects that should be reflected in both agencies, such as the independence of their decision-making (*e.g.*. the appointment of directors) or the transparency of their management (*e.g.* account audits), we assigned the country an average score calculated from both agencies' scores on the same question. For instance, if the *Comisión Nacional de Energía* of Chile was assigned 0 for not auditing its accounts and the *Superintendencia de Electricidad y Combustibles* was assigned 1 for auditing its accounts, then Chile would obtain 0.5 for that question. In those aspects where the agencies had separate responsibilities (*e.g.* the regulation of tariffs by the *Comisión Reguladora de la Energía* of Colombia and the reception of consumers' claims by the *Superintendencia de Servicios Públicos*), we assigned the country the score achieved by the agency with responsibility in that issue, regardless of the score obtained by the other agency for the same issue.

The questionnaire is composed of 97 questions (for the full version of the survey, see Appendix 2) reflecting the 4 variables of agencies' governance and both formal and informal aspects of their functioning. We also included a general section aimed at capturing characteristics of electricity markets such as the methodology for tariff calculation, the degree of market liberalization, and social tariffs.

In the design and selection of the survey's main variables and their components, we complemented our own approach with the literature review in the previous section.

3.4 The levels of analysis:

We assess the regulatory governance of electricity regulatory agencies in the LAC region through three levels of analysis. The first level of analysis considers the overall performance of electricity regulatory agencies' governance and their standing in each of the variables (autonomy, transparency, accountability, and tools). The second level of analysis focuses on the formal and informal aspects of regulatory agencies in terms of autonomy, transparency, and accountability. Finally, the third level of analysis considers the standing of regulatory agencies in each of the variables and their scores in the different elements that compose those categories.

The first level of analysis is represented by the **Electricity Regulatory Governance Index** (ERGI) and four indexes related to each of the governance variables (Autonomy Index, Accountability Index, Transparency Index, Tools Index). The ERGI is the main index and is composed of 74 questions related to agencies' four aspects of governance: autonomy, transparency, accountability, and tools. Questions reflect both formal and informal dimensions of agencies' functioning, with the exception of tools. The ERGI provides us with a ranking of LAC agencies in terms of the overall quality of their regulatory governance. The Autonomy, Accountability, Transparency, and Tools Indexes reflect agencies' positions in each of these categories.

The rest of the indexes reflect the second and third levels of analysis and their indicators derive from the ERGI. The Formal/Informal Autonomy Indexes, Formal/Informal Transparency Indexes, and Formal/Informal Accountability Indexes are aimed at identifying relationships between agencies' formal and informal regulations.[4] The different aspects of agencies' autonomy (political, managerial, and regulatory), transparency (social and institutional), and tools (regulatory and institutional) are reflected in seven indexes composed of indicators related to each of these aspects: Political Autonomy Index, Managerial Autonomy Index, and Regulatory Autonomy Index; Social Transparency Index and Institutional Transparency Index; Regulatory and Institutional Tools Indexes. They were developed to better assess the performance of an agency's governance in each of the variables. In addition, they constitute a useful tool to compare the scores of regulatory agencies in each variable and its components.

All the indexes measure their indicators with a value range between 0 (lowest) and 1 (highest), giving all variables the same weight. Although the majority of the agencies responded to the 97 questions that were part of the survey, in some cases questions were not answered. This occurred because either the agency simply did not answer or the question was not applicable. For example, an agency answered negatively to the question regarding the existence of mechanisms to involve stakeholders in the rule-making process, and thus did not answer the question related to the actual involvement of stakeholders in the same process, as it was not applicable.

Questions that were not answered because the agency omitted the response were not counted in the agency's score. In the cases of those questions that were not answered because they were not applicable to the agency, we filled that gap by considering the purpose of the index. In the ERGI and in those indexes related to agencies' formal and informal regulation (*e.g.* Formal/Informal Autonomy Index), we did not count questions that were not applicable. The rationale behind this decision is the fact that in those indexes the formal and informal aspects of agencies' governance are considered separately; hence classifying the lack of response to the informal questions as negative would unfairly affect an agency's score. In those indexes that resulted from disaggregations of the ERGI (*e.g.* Political, Managerial, and Regulatory Autonomy Indexes), we merged questions related to the formal and informal aspects of the same subject and considered one response. Using the example again of the question related to stakeholders' participation, if an agency said it did not have mechanisms to involve stakeholders in its rule-making process and then said the question related to their actual involvement was not applicable, then a negative value (0) would be assigned. If the agency's law did establish the participation of stakeholders in its rule-making process, but they did not actually get involved, then we also considered both questions as one and also assigned a negative (0) value.

Table 1: Levels of Analysis and Corresponding Indexes

LEVEL OF ANALYSIS	DESCRIPTION	INDEX	OUTCOME
OVERALL PERFORMANCE OF AGENCIES' GOVERNANCE	Analysis of agencies' autonomy, transparency, accountability and tools.	Electricity Regulatory Governance Index (ERGI)	Ranking of LAC agencies in terms of the quality of their regulatory governance.
		Autonomy Index	Ranking of LAC agencies in autonomy, transparency, accountability and tools
		Transparency Index	
		Accountability Index	

		Tools Index	
FORMAL AND INFORMAL DIMENSIONS OF AGENCIES' GOVERNANCE	Analysis of the formal and informal aspects of agencies' autonomy, transparency and accountability. Tools is excluded from this approach as we only consider the use by the agency of selected tools (informal regulation)	Formal/Informal Autonomy Index Formal/Informal Transparency Index Formal/Informal Accountability Index	Agencies' performance in the formal and informal aspects of their governance Relationships between the formal and informal dimensions of agencies' governance
COMPONENTS OF REGULATORY GOVERNANCE VARIABLES	Analysis of each dimension of governance variables. Questions reflect both formal and informal regulation.	Political Autonomy Index, Regulatory Autonomy Index, Managerial Autonomy Index Social Transparency Index, Institutional Transparency Index Regulatory Tools Index, Institutional Tools Index	Performance of electricity regulatory agencies in each of the aspects of agencies' autonomy, transparency and tools Comparison between agencies' positions in the Autonomy, Transparency, Accountability and Tools Indexes and their scores in each of the variables' components

4. THE ASSESSMENT OF LAC ELECTRICITY AGENCIES' REGULATORY GOVERNANCE:

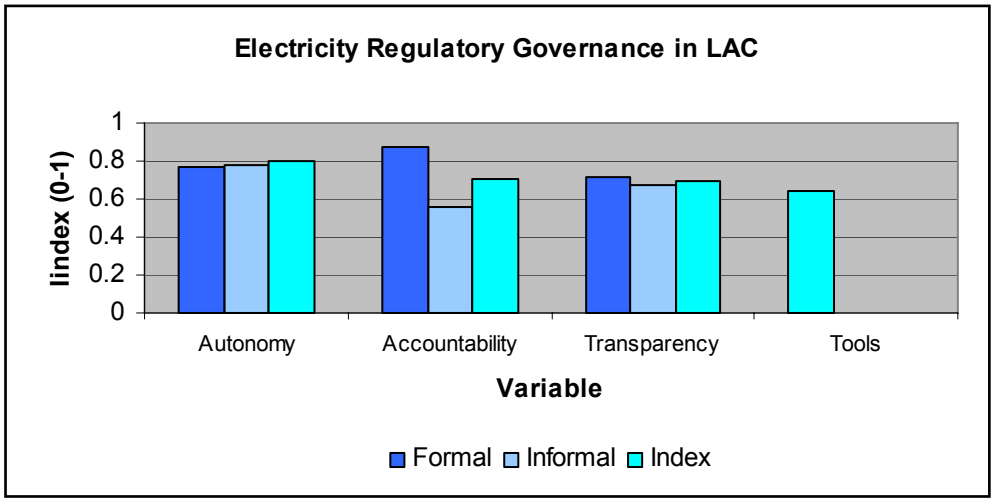
This section presents the analysis of regulatory agencies' governance. Its first part, the Regional Analysis, addresses the regional context of regulatory governance in LAC. The Country Analysis presents country-level results for the ERGI. The third section, the Variables Analysis, explains each of the regulatory governance variables in greater detail. In the fourth section, we test the robustness of our approach by giving governance variables different weights.

4.1 Regional analysis:

The LAC region presents a wide spectrum of institutional design in its electricity regulatory agencies. Although the majority of countries chose an agency's design that reflected the governance of US independent commissions, others developed their own institutional arrangements for electricity regulation. This has been the case of Chile and Colombia, countries that have split regulatory responsibilities in two agencies, one in charge of the main regulatory functions (National Energy Commission) and one in charge of enforcement of the regulatory framework, particularly in terms of the imposition of sanctions and the observance of service quality standards (*Superintendencia*). The rest of the countries, which introduced regulatory agencies during the reform of the electricity sector in the 1990s, present a governance design in which the agency has both regulatory and oversight responsibilities with different degrees of independence from the government.

Our results indicate the prevalence of autonomy over the rest of the variables, with tools as the index's component with the lowest score. With the exception of Chile and Colombia, countries that have chosen a particular regulatory design for their electricity agencies, the rest of the countries in the region have opted for a model that emphasizes its independence from political authorities over other aspects of its functioning. LAC countries have also stressed agencies' accountability before the Executive, the Legislative and the Judiciary and, to a less extent, the inclusion of mechanisms and procedures to guarantee their transparent management (transparency) and the implementation of their decisions (tools).

Figure 5: Ranking of Electricity Regulatory Governance Variables



Source: LAC Electricity Regulatory Governance Database. The World Bank. 2007

The region's average in the Electricity Regulatory Governance Index (ERGI) is 0.74. Among the different variables that compose the ERGI, the region achieves its best performance in autonomy (0.79), followed, respectively, by accountability (0.73), transparency (0.72), and tools (0.66). The highest score achieved in autonomy and the lower results in other aspects of agencies' governance might reflect the tendency of LAC countries to emphasize regulatory agencies as a means to gain credibility before investors (Gilardi, 2002). While there are degrees of variation, the majority of independent regulators in the electricity sector have a board of directors appointed by the President with the authorization of the Congress, a separate status from the line ministry, and separate budgeting (although there are different levels of autonomy in the management of funds). The lowest levels of autonomy can be found in agencies in charge of both regulation and sector planning (Chile and Colombia), where the government, through the line minister and other ministers, is part of the agency's decision-making process.

Accountability ranks as the second variable after autonomy and indicates the level of oversight of the agency by different public bodies (usually the Parliament and the Executive branch). In addition, it reflects the existence of mechanisms for internal auditing and the regulatees' ability to appeal agencies' decisions. The majority of agencies in the electricity sector are subject to the oversight of both the Parliament and the Executive, although they have greater accountability obligations to the latter. Another factor that contributes to the regional score in accountability is the ability to appeal decisions before the judiciary and not exclusively the government. The review of agencies' decisions by the judiciary prevents the government from interfering in the agency's rule-making and implementation of those rules.

The top ranking of the autonomy variable and the lower scores given to transparency and institutional and regulatory tools might be explained by the lack of progress in improving the institutional quality of the agencies (represented in the ERGI by several components of the transparency and tools variables). With some exceptions, the process that started with the initial creation of regulatory agencies in the LAC region has not been furthered and deepened. For instance, few agencies publicize their job posts or have developed public exams for hiring employees. On the tools side, the utilization of regulatory quality standards (such as the use of cost-benefit analysis to assess the impact of regulations) or performance-based payments for employees are practices that have been rarely implemented.

The ERGI also considers the formal and informal aspects of agencies' functioning: the association or lack thereof, between provisions in the agencies' laws and regulations and the implementation and development of those frameworks. According to the ERGI, differences are not significant, but show higher levels of formal regulation compared to agencies' practices. Transparency does not experience a significant disassociation, although there is a higher level of formal regulation compared to outcomes in agencies' transparency practices. The largest differences are found in accountability, where even though agencies are subject to the control of both the Executive and the Parliament, actual practices show a stronger oversight of the former.

The factors that cause low levels of informal accountability are the obligations of the agency vis-à-vis the government and the agency's reporting instruments. In the LAC region, electricity regulatory agencies are subject to stronger controls by the Executive branch than by the Parliament. Despite the fact that the majority of the agencies are accountable to both branches, the Executive has overall more interaction with the agency. The negative score for an agency that is fully accountable to the Executive is based on our benchmark, the US independent regulator model, where the government is responsible for policy formulation and the Parliament has the oversight role. There are also poor results for informal accountability of electricity agencies in terms of reporting instruments. Whereas in the independent regulator model, agencies are subject to the public hearings of their directors before the Parliament and also must draft annual reports to inform the Parliament and the general public, in the LAC region agencies are obliged to follow only one reporting approach, and there are only a few cases where agencies are subject to this double requirement.

As previously indicated, we do not consider formal and informal aspects of the "tool" variable. This variable reflects the actual use of agencies' instruments and only its informal side is considered.

4.2 Country analysis:

The previous section allowed us to determine the regulatory governance quality of electricity regulatory agencies in the LAC region and the region's status in each of the variables. The ERGI also allows us to determine the ranking of LAC countries. Figure 6 represents the positions of LAC agencies in the ERGI. We distinguish three tiers or groups of countries. Tier 1, which includes countries that are above T1 in the graphs, encompasses agencies that have "desirable" conditions to develop good regulatory governance. Agencies' responses in this tier are close to the highest value for each of the questions. It reflects an institutional design characterized by high standards of governance in autonomy, transparency, accountability, and tools. Tier 2, countries that are between T1 and T2 in the different graphs, encompasses agencies that only meet the minimum conditions that we consider necessary to implement the independent regulator model. It reflects an institutional design that we believe needs to be at least in place to guarantee acceptable levels of regulatory

governance. Agencies in Tier 2 have fewer responsibilities than those in T1 and lower levels of autonomy from the line minister. They also have less sophisticated mechanisms for publishing their decisions and policies. Tier 3, countries behind T2 in the different graphs, includes agencies that do not meet the minimum conditions to implement our benchmark model of regulatory governance.

Among the nineteen countries included in the research, only Trinidad and Tobago and Brazil are the countries grouped above Tier 1. Very close to them, although under Tier 2, are Bolivia, Peru, and El Salvador. Countries in Tier 3 are Ecuador, Chile, and Honduras. The rest of the countries belong to Tier 2.

Figure 6: ERGI scores

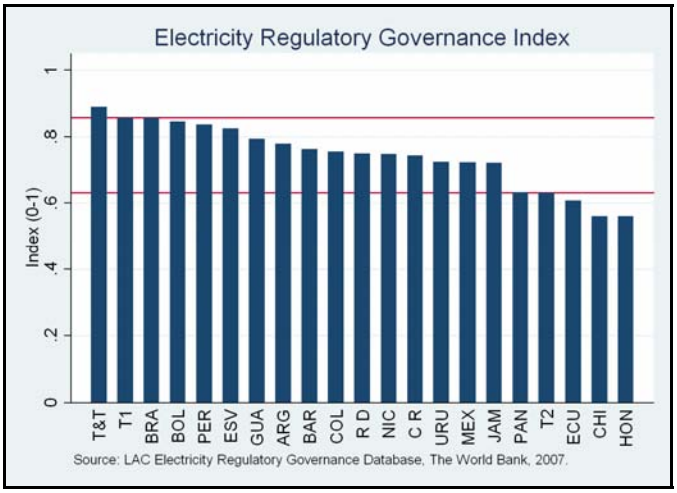


Table 2 represents countries' positions and scores in the ERGI and in the Autonomy, Transparency, Accountability, and Tools Indexes. Consistently with the regional analysis, autonomy is the variable with the highest score for Tier 2 and Tier 3 countries, with a slight difference towards accountability in the case of countries above T1. Bolivia's *Superintendencia de Electricidad*, Nicaragua's *Comision Nacional de Energia*, and the Dominican Republic's *Superintendencia de Electricidad* have the highest score (0.95). Chile (considering both the *Comision Nacional de Energia* and the *Superintendencia de Electricidad y Combustibles*) is the country with the lowest level of autonomy in electricity regulatory governance design (0.28).

Table 2: Country rankings in the ERGI and four Indexes

	ERGI		AUTONOMY		TRANSPARENCY		ACCOUNTABILITY		TOOLS	
	Position	Score	Position	Score	Position	Score	Position	Score	Position	Score
Argentina	7	0.80	6	0.85	8	0.71	10	0.71	8	0.83
Barbados	8	0.76	10	0.82	8	0.71	4	0.83	10	0.59
Bolivia	3	0.84	**1**	**0.912**	5	0.80	3	0.84	4	0.78
Brazil	2	0.85	5	0.87	6	0.79	2	0.87	2	0.90
Chile	18	**0.56**	**19**	**0.57**	12	0.63	**16**	**0.50**	12	0.52
Colombia	9	0.75	18	0.67	5	0.8	6	0.79	7	0.71
Costa Rica	12	0.74	8	0.84	7	0.74	10	0.71	10	0.59
D. Republic	10	0.75	3	0.90	8	0.71	8	0.74	12	0.51
Ecuador	17	0.60	17	0.70	15	0.57	12	0.65	13	0.40
El Salvador	5	0.82	7	0.84	2	0.86	5	0.81	7	0.71
Guatemala	6	0.79	12	0.80	13	0.62	2	0.87	**1**	**0.93**
Honduras	**19**	**0.56**	16	0.70	**16**	**0.53**	14	0.54	**14**	**0.37**
Jamaica	15	0.72	14	0.78	10	0.68	13	0.62	3	0.86
Mexico	14	0.72	15	0.75	4	0.83	7	0.75	**14**	**0.37**
Nicaragua	11	0.74	2	0.91	11	0.66	9	0.72	9	0.63
Panama	16	0.63	11	0.81	14	0.59	15	0.52	11	0.54
Peru	4	0.83	4	0.90	3	0.85	7	0.75	3	0.86
T & T	**1**	**0.88**	9	0.82	**1**	**0.92**	**1**	**0.97**	5	0.76
Uruguay	13	0.72	13	0.80	9	0.69	11	0.67	6	0.72

Source: LAC Electricity Regulatory Governance Database. The World Bank. 2007

Six distinctive factors in autonomy explain the lower scores achieved by countries at the bottom compared to countries at the top of the ERGI: 1) the institutional status of the agency: although in all the countries regulatory agencies are a separate entity from the line ministry, agencies with low scores in autonomy lack legal independence from the government (particularly in the cases of Mexico and Chile); 2) the joint regulation of the sector between the agency and the Executive or the Congress (Chile and Mexico); 3) the limited extent of the agency's regulatory powers (in the cases of Uruguay and Mexico, the agency lacks pricing powers and the minister approves tariffs); 4) the minister's responsibilities in terms of the main regulatory issues (in the particular cases of Chile, Mexico, and Uruguay, the agency does not have final decision power on tariffs and companies' investment plans); 5) the appointment of the Board of Directors by the President without the intervention of the Parliament; and 6) the level of government funds in the budget (in both Chile and Mexico the agency's budget is composed exclusively of government funds; in Uruguay, although the electricity provider is a state-owned company, the agency charges a regulation tax to the electricity companies).

In the case of Chile, its low position in autonomy is explained not only by the regulatory power of the ministry in tariff regulation but also by the high involvement of political authorities in the agency's decision-making. For instance, the Board of Chile's *Comisión Nacional de Energía* is composed of different ministries and headed by the minister of energy. Market liberalization does not explain agencies' institutional design in this country. Despite the unbundling of the sector in 1980, the intervention of government authorities in regulatory issues is still as important as in countries that have not privatized their public companies (*e.g.* Mexico and Uruguay). The governance design of Chile's regulatory agencies seems to be more linked to the country's institutional traditions than to the particular policies that shaped its electricity sector.

Accountability is the second highest variable with a regional score of 0.73. Trinidad and Tobago's *Regulated Industries Commission* is the agency with the highest score (0.97) and Chile (considering

both the *Comisión Nacional de Energía* and the *Superintendencia de Electricidad y Combustibles*) is the country with the lowest level of accountability (0.50).

The main difference between best and worst performers in accountability is the heavier obligations to the Executive of the latter. Countries at the top of the ERGI, with the exception of Bolivia and Peru, have a more balanced distribution of obligations between the Executive and the Parliament and are not fully accountable to the Executive. In contrast, countries at the bottom of the ERGI are heavily dependent on the Executive, to which they are, in most of the cases, fully accountable.

Transparency is the third variable in order of prevalence with a regional score of 0.72. Trinidad and Tobago's Regulated Industries Commission is the agency with the highest score (0.92) and Honduras' *Comisión Nacional de Energía* is the agency with the lowest performance (0.53).

Differences are not significant between best and worst performers in transparency, with the exception of Ecuador among the latter. Both best and worst performers have collective decision-making structures, mechanisms to allow the participation of their stakeholders in their rule-making processes, adequate mechanisms to report their activities to the required institutions and to publish their annual reports. The only aspect in which worst performer countries show lower scores is in public consultations. Neither Mexico's National Regulatory Energy Commission nor any of Chile's regulatory agencies conduct public consultations. In the case of Mexico, public consultations are conducted by the Federal Commission for Regulatory Improvement (*Comisión Federal de Mejora Regulatoria*, COFEMER). Ecuador's electricity regulatory commission is the agency with the worst performance in transparency. Its main weaknesses lie in the instruments used to improve institutional development, such as the publication of its annual report, the use of public exams to hire employees, and the publication of job vacancies.

Among the best performer countries, Trinidad and Tobago's agency has the highest level (0.92) of transparency in the region. The rest of the countries score approximately 0.8. Among the worst performers, Mexico has the highest results (0.83), followed by Uruguay, Chile, and Ecuador.

In the results for the region, "tools" is the variable where countries, regardless of ranking, have their lowest scores. This variable is not only a measure of tools related to the application of the agencies' regulatory policies such as benchmarking or the methodology for tariff revision, but also of instruments aimed at improving institutional and managerial quality (*e.g.*, the publication of the agency's annual report or the use of performance-based payments). Guatemala's *Comisión Nacional de Energía Eléctrica* is the agency with the highest ranking for tools (0.93) and both Honduras' *Comisión Nacional de Energía* and Mexico's *Comisión Nacional Reguladora de Energía* have the lowest scores for this variable.

The main factors that explain the differences between best and worst performers in terms of the tools variable are: 1) the use of benchmarking; 2) the extent and number of regulatory instruments; 3) the publication of the agency's annual report; 4) the registration of users' claims; 5) the utilization of regulatory quality standards; and 6) the existence of a structure of posts and salaries.

4.3 Variables' analysis:

This part of the paper disaggregates the variables: Autonomy is broken down into political, managerial, and regulatory autonomy; transparency into social and institutional transparency; and tools into regulatory and institutional tools. Accountability considers only an institutional

perspective regarding the relationships between the agency and the other branches of government (Executive, Legislative, and Judicial) and no further division is made of its different indicators.

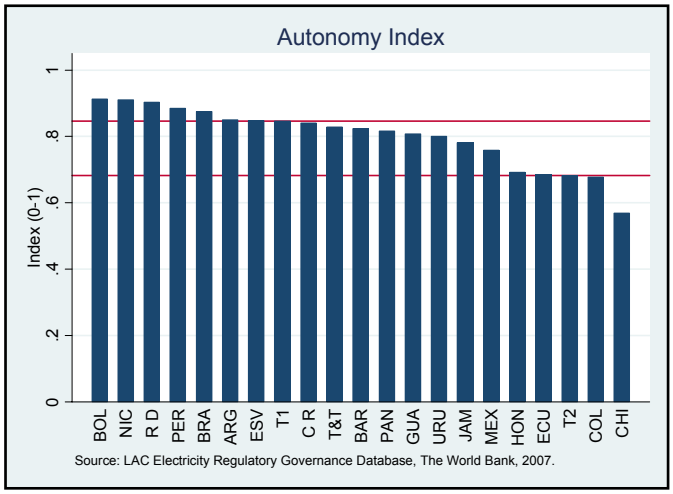
The dissection of the variables into different elements gives a better picture of the composition of each category and the position of the agencies in each of the indexes that represent them. It is also useful to compare agencies' scores in the variables indexes (*e.g.,* the Autonomy Index) and their performance in each of their components (*e.g.,* the Political Autonomy Index).

We conduct a three-level analysis of each variable. First, we define the governance variable and identify countries' position in the index. Second, we compare countries' position in the main variable and the scores in the different components of that variable. A third level of analysis consists of analyzing the formal and informal dimensions of autonomy, transparency, and accountability. In all the three level of analysis we also make use of our ¨Tiers¨ approach. The variable "tools" is excluded from the formal vs. informal analysis. The mere existence of the instruments included in this variable assumes their actual implementation.

4.3.1 Autonomy:

The autonomy variable considers the procedures, mechanisms, and instruments aimed at guaranteeing the independence of the agency from political authorities (political autonomy), the autonomous administration of its resources (managerial autonomy), and the regulation of the sector (regulatory autonomy). Its indicators reflect both formal and informal regulation capturing a wide range of aspects related to the autonomy of the agency. The variable is represented by the Autonomy Index, which gives us the scores of LAC electricity agencies.

Figure 7: Autonomy Index



Tier 1 shows countries with a "desirable" governance level to guarantee an autonomous functioning of the agency. Countries grouped under Tier 2 are those that meet those requirements we consider minimum to achieve a certain degree of autonomy in its functioning. Finally, countries in Tier 3, below T2, are those that lack the minimum preconditions to carry out their roles as autonomous agencies.

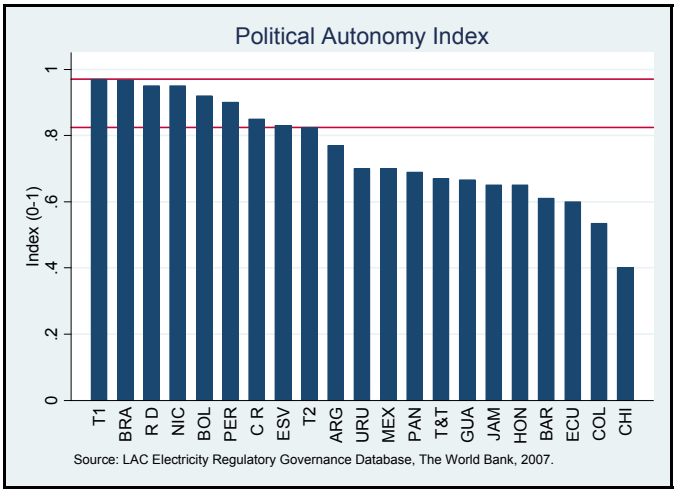
Agencies below T2 are those in Colombia and Chile. The positions of Chile and Colombia among countries below T2 levels are mainly explained by the weight of the government in the decision-making process of the agencies. In both countries, particularly at the level of the agencies with the

main regulatory responsibilities (*Comisión Nacional de Energía*), the Board of Directors is composed of sector ministers and headed by the line minister.[5] Moreover, in both countries, the heads of the agencies in charge of the enforcement of quality standards and consumer complaints (*Superintendencia*) are also appointed and removed by the President with no involvement of other institutions. These factors differentiate Chile and Colombia from other countries of the region in which the Board is composed of members that are not policy formulator's authorities. Nevertheless, this observation is a reflection on the design of the agency and does not speak about the real impact of government in the agency's decision-making, which is especially addressed in the Informal Autonomy Index. In our framework, we assume that an agency whose Board is composed of ministers will tend to be less independent from the government than an agency that is integrated by non-public official members.

A. Political autonomy:

This element of an agency's autonomy reflects the level of independence of the agency from political authorities. Its focus is on the independence of the agency's decision-making from authorities in charge of policy formulation, namely the line minister. It includes issues such as the mechanism to select agencies' directors, the renewability of directors' mandates, the number of directors that have not completed their terms, the reasons directors leave their positions, the interference of the minister in the agency's decisions, and the composition of the agency's budget.

Figure 8: Political Autonomy Index



The Political Autonomy Index has the largest number of countries among Tier 3 agencies. It could be understood from this finding that the independence of agencies from political authorities is the most significant deficiency of agencies in terms of their autonomy. Only Brazil is among Tier1 countries.

Tier 3 countries present a wide variety of agencies. There are agencies from which we would expect their positioning among T3 such as Ecuador, Honduras, and Chile. Nevertheless, countries with a good overall performance in the ERGI and the Autonomy Index such as Trinidad and Tobago and Argentina are also part of this group of agencies.

[5] In the case of Colombia's *Comisión de Regulación de Gas y Energía*, the Board is also composed of five experts appointed by the President of the country.

The scores of best performers in the Political Autonomy Index significantly differ from countries at the bottom of that index. These results stem from both institutional and factual aspects of agencies regulatory governance. The agencies of Brazil, the Dominican Republic, and Bolivia are designed with a separate status from the line ministry, a clear separation of roles between the agency and the government authorities, and a budget composed exclusively of a regulation tax charged to electricity companies. Directors leave mostly due to retirement, voluntary leave, or the completion of their appointments, and the line minister, according to the opinions of the agency, has a low level of influence on the agency's affairs.

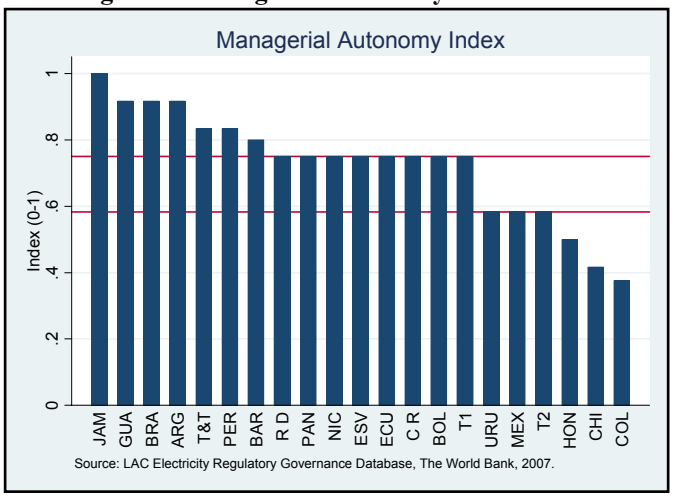
The factors distinguishing countries at the bottom of the Political Autonomy Index are also due to both issues of institutional design and agencies' practices. Among the former, Colombia and Chile's regulatory agencies, namely their National Energy Commissions, are separate entities but with no autonomy from the line minister. Moreover, the sector ministry is part of both agencies, and heads their Boards. In both countries, directors are appointed by the President, with Chile's National Energy Commission Board composed only of ministers (in Colombia's National Energy and Gas Regulatory Commission, the Board is also integrated by experts). Finally, in the cases of both Chile's National Energy Commission and the *Superintendencia de Electricidad* and Colombia's *Superintendencia de Servicios Públicos*, their budgets are composed exclusively of government funds without any type of income from electricity companies (regulation tax). The exception to this is the case of Colombia's National Energy and Gas Commission, whose budget is entirely funded by a regulation tax charged to electricity providers.

Among the practices that characterize the agencies of the worst performers on the Political Autonomy Index, the main factors are the intervention of ministers in the agencies' decision-making and the times and reasons directors have left the agencies' Boards. In the cases of Chile and Colombia's National Commissions, the line minister is part of the agency and, hence, of its decision-making. In the case of Ecuador's *Consejo Nacional de Energía Eléctrica* (CONELEC), the sector minister can give instructions to the agency on issues related to the country's energy policy. In terms of the reasons directors leave the agency, in both Chile and Colombia directors are ministers who are appointed and dismissed by the President, without the intervention of other authorities. In Ecuador, one of the main reasons cited for directors leaving their positions is external pressure. Moreover, since the creation of CONELEC in 1999, twenty directors have left their positions (the highest number of directors leaving their positions out of any LAC electricity regulatory agency).

B. Managerial autonomy:

Managerial autonomy involves the freedom of the agency to determine the use of its budget and the organization of its resources. It includes aspects such as the ability of the agency to determine its organizational structure, the freedom to make its own decisions on personnel, the financial autonomy to determine its own expenses, and the type of legal regime that applies to its employees (private law, civil service law, or both). It also includes other aspects related to tools that contribute to improving its management, such as the existence of its own structure of posts and salaries and of performance-based payments for its employees.

Figure 9: Managerial Autonomy Index



Countries' rankings in managerial autonomy are reflected in the Managerial Autonomy Index. Jamaica, Guatemala, Brazil, Argentina, Trinidad and Tobago, Peru, and Barbados are among those countries with desirable conditions to manage its resources. These agencies show the existence of adequate mechanisms and procedures to guarantee an autonomous administration of the agency by its authorities. On the contrary, Colombia, Chile, and Honduras, in that order, are the countries with less managerial freedom and where the space of the agency to decide its organizational structure and the use of its resources is limited.

Results in this section are not an indication of the effectiveness of the agency's management, but of powers aimed at allowing the agency an autonomous administration. This is particularly the case of Chile, whose public sector bureaucracy is, according to several governance indicators[6], well-trained and based on meritocracy

Countries at the top of the index have full powers in all the aspects mentioned in the first paragraph. Brazil is among the leading countries in managerial autonomy, emerging from the middle of the Autonomy Index with Jamaica, Guatemala, and Argentina. In contrast, agencies at the bottom of the index lack the autonomy to determine their organizational structures and do not have the power to

[6] According to World Bank's Governance Effectiveness indicator, Chile heads the LAC region in terms of the quality of its policy-making. The Governance Effectiveness index measures the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. It is the result of a large number of individual data sources that provide information on perceptions on governance (Kauffman, 2006).

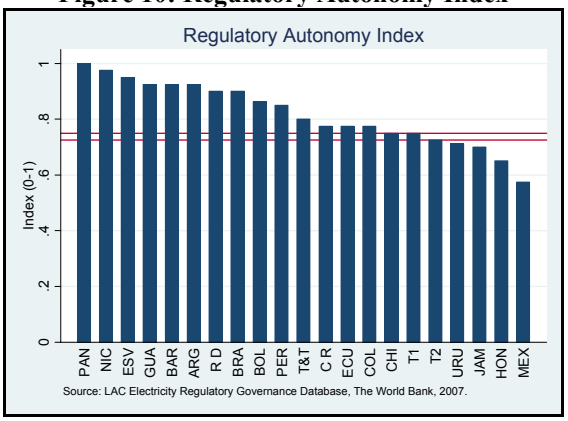
freely establish the use of their resources. In terms of the regime that regulates their employees, they generally lack their own structure of posts and salaries and do not utilize incentives to determine their payments.

C. Regulatory Autonomy:

This dimension of agency's autonomy is represented by the extension of the agency's regulatory powers. It includes characteristics such as the institution responsible for the regulation of the sector (the agency, Parliament, the Executive or some combination among them); the type of the agency's powers (consultative, oversight, pricing, and rule-making); the agency's responsibilities regarding particular issues (tariffs, service quality, consumer complaints, companies' investment plans, wholesale market, anti-competitive behavior, technical standards); and the agency's powers to enforce its decisions.

Performance in regulatory autonomy is represented in the Regulatory Autonomy Index. The majority of countries of the region are in Tier 1, with only four countries below T2. Countries at the top of the index are Panama, Nicaragua, El Salvador, Guatemala, and Brazil. Countries with the lowest scores are Mexico, Honduras, Uruguay, and Jamaica.

Figure 10: Regulatory Autonomy Index



Countries at the top of the Autonomy Index keep their high positions in the Regulatory Autonomy Index, with the exception of Panama who ascends several places from the Autonomy Index and becomes the top ranking country. Chile improves its position in the Regulatory Autonomy Index compared to its score in the Autonomy Index. Both Chile and Colombia improve their low scores in political autonomy, joining those countries in the middle of the Regulatory Autonomy Index.

The improvement of Chile in the Regulatory Autonomy Index is explained by the extension of agencies' regulatory powers. Although the CNE does not determine tariff levels, it has an important role in the regulation of the sector, enough powers to enforce their decisions, and responsibilities in other regulatory issues such as service quality and technical standards.

Countries with desirable conditions in the Regulatory Autonomy Index such as Panama, Nicaragua, and El Salvador have full responsibilities for areas such as tariffs, service quality, standards, and investments, as well as the power to implement sanctions and regulations. By contrast, countries that do not meet the minimum requirements in terms of the extension of their regulatory prerogatives have little responsibility for specific regulatory issues and no powers to enforce regulations. For instance, Uruguay's *Unidad Reguladora de Servicios de Energía y Agua* and Mexico's *Comisión Reguladora de Energía* have oversight only on issues related to consumer complaints, service quality, and anti-competitive behavior, and lack authority in areas such as tariffs and companies' investment plans. Moreover, Honduras and Jamaica do not have the ability to enforce their decisions, reducing their capacity to effectively regulate the sector.

It is interesting to observe that there is not necessarily a relationship between the scores in political and regulatory autonomy. Although the best performers in political autonomy (Brazil, Dominican

Republic, Nicaragua, and Bolivia) did not significantly change their positions in the Regulatory Autonomy Index, some countries in the middle and lowest positions of the Political Autonomy Index experienced a significant improvement in their standing in the Regulatory Autonomy Index. This was particularly the case for Panama, Guatemala, Colombia, and Chile. Panama leads the Regulatory Autonomy Index with the maximum score (1.00), leaving its middle position in political autonomy (0.68). Guatemala experiences a notorious improvement that places it among the leading countries in regulatory autonomy (0.92), leaving its middle position in political autonomy (0.66). Finally, both Colombia and Chile leave their places as worst performers in political autonomy (0.53 and 0.40, respectively), reaching an average score of 0.76 in the Regulatory Autonomy Index.

The changes experienced by regulatory agencies in political vs. regulatory autonomy explains the importance of linking political independence to the expansion of the agencies' regulatory powers. In other words, an agency can have the highest level of independence from political authorities, but no relevant powers in the regulation of the sector, making independence an abstract characteristic of the agency's functioning with no real impact on regulation. The same conclusion was observed in an assessment of European electricity regulators, where it was found that even if regulatory agencies shared the same regulatory objectives, there were significant variations in the means the regulators have to pursue to achieve those objectives (Johannsen, 2003).

D. Formal vs. Informal:

It was previously said that there were no significant differences between the formal and informal elements of agencies' autonomy at the regional level. At the specific agency level, only Uruguay's *Unidad Reguladora de Servicios de Energía y Agua* and Ecuador's *Consejo Nacional de Electricidad* experience a variation between the formal and informal aspects of their autonomy. Uruguay significantly improves upon its formal autonomy position (0.67), becoming the best performer in the Informal Autonomy Index (0.93). On the other hand, Ecuador experiences a significant drop from its formal autonomy score (0.82), becoming the worst performer in the Informal Autonomy Index (0.54).

Figure 11: Formal Autonomy Index

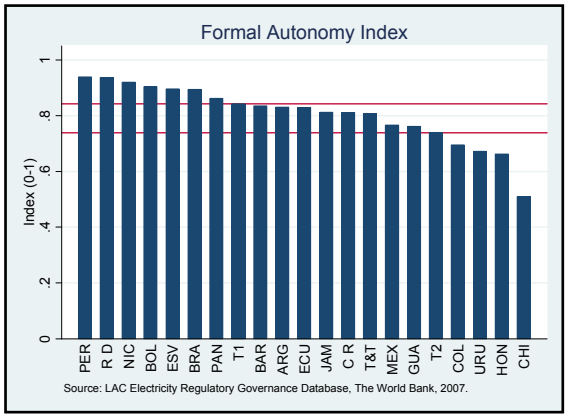
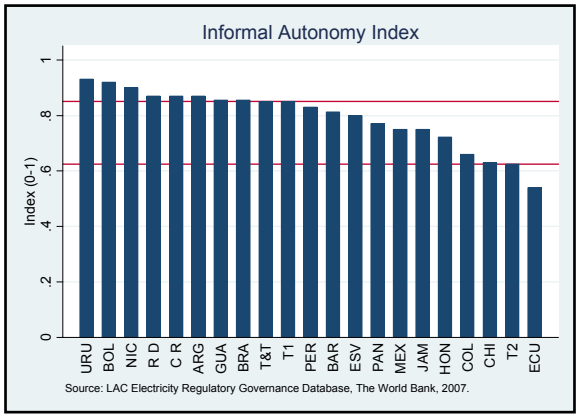


Figure 12: Informal Autonomy Index



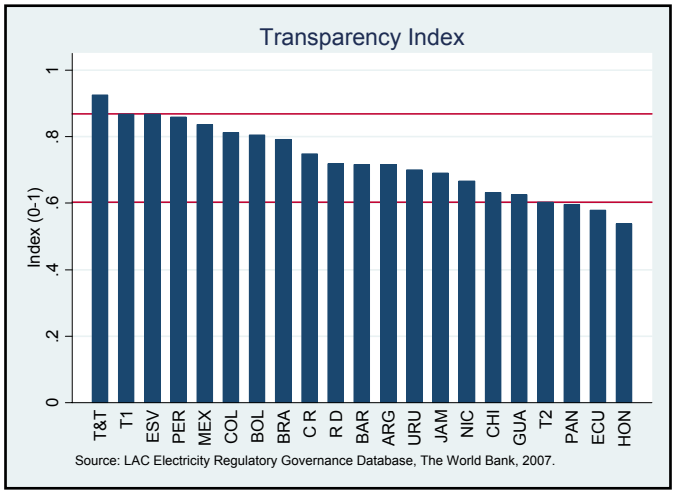
There is not necessarily a relationship between the indicators of formal and informal elements of agencies' autonomy. Indicators of formal autonomy represent several aspects of an agency's political, managerial, and regulatory autonomy. Indicators of informal autonomy are mostly represented by political autonomy characteristics. Hence, the presence of Uruguay and Ecuador at the top and bottom, respectively, of the informal autonomy index might explain the degree of actual

independence of the agency from political authorities. The low position of Uruguay in the Formal Autonomy Index may reflect an institutional design that lacks provisions to guarantee the political independence of the agency (which, according to the informal index, is quite high) or ensure the autonomous management of its resources; or it may reflect the existence of limited regulatory powers in the agency's responsibilities.

4.3.2 Transparency:

Transparency includes the procedures, mechanisms, and instruments aimed at guaranteeing the disclosure and publication of relevant regulatory and institutional information, the participation of stakeholders in the agency's regulatory decisions and decision-making, and the application of rules aimed at governing the integrity and behavior of agency officials. It has a regional average of 0.69.

Figure 13: Transparency Index



Leading countries in the Transparency Index are Trinidad and Tobago, El Salvador, Peru, and Mexico. Countries at the bottom are Panama, Ecuador, and Honduras. Results indicate a slight preference of electricity agencies in the LAC region for procedures and instruments aimed at allowing the involvement of non-institutional stakeholders and their access to agency decision-making and information (social transparency), as opposed to the use by agencies of procedures and tools to improve institutional transparency. Social transparency obtains an average of 0.76, compared to 0.64 for institutional transparency.

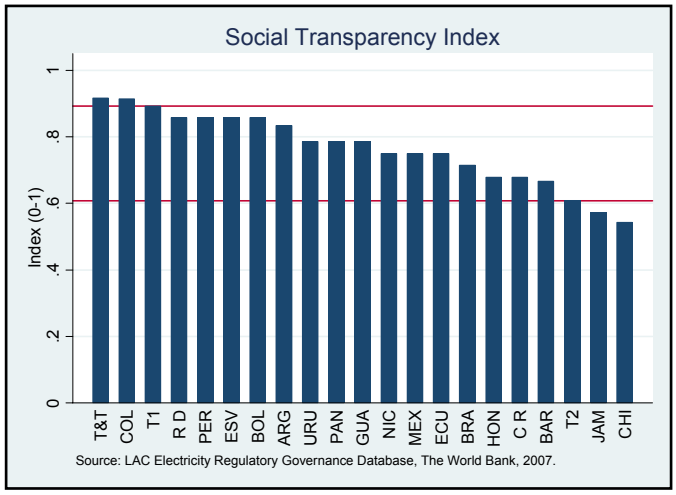
The division of countries in three tiers allows us to see that only Trinidad and Tobago meets the criteria to be included among agencies with a desirable level of transparency. Most countries in the region only meet the minimum conditions to guarantee the access of the different stakeholders to the agency's information and its regulatory making and the transparent management of its resources (for instance, the publication of its job vacancies). Panama, Ecuador, and Honduras do not even meet the necessary conditions to guarantee its transparency.

A. Social Transparency:

The social aspects of transparency are related to the involvement of stakeholders in the agency's decision and rule-making processes and their access to the agency's information. Social

transparency includes issues such as the participation of stakeholders in the agency's rule-making process, the publication by the agency of its decisions, the organization by the agency of public consultations, the existence of advisory committees in the agency's structure, the existence of a website, and the registration of users' claims.

Figure 14: Social Transparency Index



Agencies' positions in social transparency are represented in the Social Transparency Index (Figure 14). The index is headed by Trinidad and Tobago and followed by Colombia, the Dominican Republic, Peru, El Salvador, and Bolivia. Countries at the bottom of the index are Jamaica and Chile. Among countries at the top of the index, only Trinidad and Tobago and Colombia meet the conditions to develop "desirable" levels of social transparency. On the other hand, Nicaragua, Panama, and Ecuador do not meet the minimum conditions that allow users an appropriate access to the agency's information and their involvement in their regulatory-making process.

Leading countries in the Transparency Index keep relatively similar positions in social transparency, with the exception of the Dominican Republic, which significantly improves its score in social transparency. By contrast, countries at the bottom of the Transparency Index—namely Ecuador and Honduras—show significantly improved positions in the Social Transparency Index.

Differences between countries at the top and bottom of the Social Transparency Index center on three main aspects. The first aspect is the participation of the stakeholders in the agency's rule-making process. While public consultations or public hearings are aimed at allowing the involvement of stakeholders in the agency's main decisions, the rule-making process is the mechanism through which the regulatees are invited to contribute with their opinions in the elaboration of the agency's regulations. Contrary to countries at the top, countries at the bottom of the Social Transparency Index either lack provisions to involve stakeholders in the rule-making process or, even though these provisions exist, stakeholders do not actually get involved in that process.

The second aspect is the existence of advisory committees integrated by different stakeholders in the structures of best performing agencies. These committees are supposed to play an important role in the agency's decision-making by representing and promoting different group interests (mainly consumers).

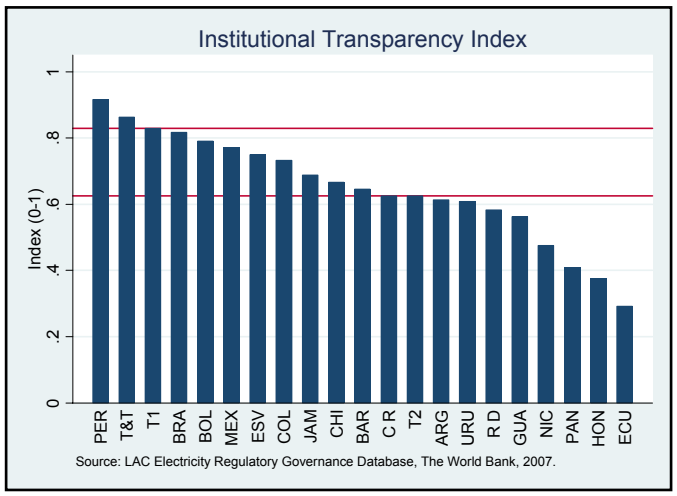
The third and last aspect is the registration of users' claims. Best performing agencies register consumer claims through both paper-based and electronic mechanisms, allowing a faster resolution of the user's case and easier access to those files by the regulatees (at both the agency and through the website). By contrast, countries at the bottom of the Social Transparency Index register users' claims through paper-based mechanisms, preventing the modernization of the agency's mechanisms to resolve users' complaints.

It is interesting to observe the different behavior of Chile and Colombia in terms of transparency. Although they share a similar design of their regulatory institutions[7] and similar levels of autonomy, Colombia significantly surpasses Chile in its level of transparency. This factor allows us to highlight the openness of the Colombian electricity agency's governance, despite its vulnerability to government interference.

B. Institutional transparency:

The second dimension of transparency, institutional transparency, is composed of indicators related to the transparent management of the agency that are not directly linked to the involvement of the sector's stakeholders. It includes aspects such as the nature of the agency's decision-making (collective or individual), the existence of quarantine rules for directors, the agency's reporting instruments (annual report and public hearing before the Congress), the publication of the agency's institutional strategy and annual report, the publication of the agency's audit accounts and of its career posts, the existence of norms of ethics, the record of the Board's meetings, and the use of public exams to hire employees.

Figure 15: Institutional Transparency Index



Countries at both the top and the bottom of the Transparency Index keep similar positions in the Institutional Transparency Index. Peru and Trinidad and Tobago are countries with "desirable" levels of institutional transparency, obtaining the best scores. Countries under tier 3, particularly Panama, Honduras, and Ecuador do not meet the minimum levels considered in the ERGI for a transparent management of the agency's resources and activities.

[7] Each has a National Energy Commission in charge of the main aspects of regulation and some policy formulation responsibilities, and a Superintendencia as an oversight entity in charge of sanctioning and consumer complaints.

Several factors cause agencies to be positioned at the top of the index. The first factor is related to the existence of collective decision-making composed of a Board of Directors. As opposed to a single decision-making structure, a Board composed of directors with varied technical backgrounds allows more comprehensive and diverse debates on regulatory issues than a decision-making by a single policy maker. The second factor is related to the publication of information such as job vacancies, an annual report, an institutional strategy, and audited accounts. Finally, a record of the Board's meetings and the existence of quarantine rules for directors that leave the agency also contribute to the high performance of countries at the top of the index.

Agencies with good performance in institutional transparency tend to possess characteristics related to administrative modernization. For instance, the publication of the organization's institutional strategy, annual report, and job vacancies are indicators of agencies concerned not only with sector-based policies related to transparency (such as the conducting of public hearings) but also with mechanisms and procedures aimed at making them more effective as administrative bodies.

Chile achieves its second highest performance in institutional transparency (ninth place) relative to its position in the other indexes. Despite the strong intervention of government authorities in Chile's agencies, one cannot overlook the bureaucratic quality of its public administration. In fact, Chile heads the region in Government Effectiveness, a governance indicator developed by the World Bank to measure the quality of a country's bureaucracy. [8]

C. Formal vs. informal:

There are no significant regional variations between the formal and informal dimensions of agencies' transparency. Bolivia, the Dominican Republic, Guatemala, Colombia, Nicaragua, Costa Rica, and Mexico are the countries that show the largest disparities. Bolivia, the Dominican Republic, and Guatemala are countries with higher levels of informal transparency compared to their scores in the formal transparency index. However, Colombia, Nicaragua, Costa Rica, and Mexico show lower levels of informal transparency compared to their performances in the formal aspects of the variable.

Figure 16: Informal Transparency Index

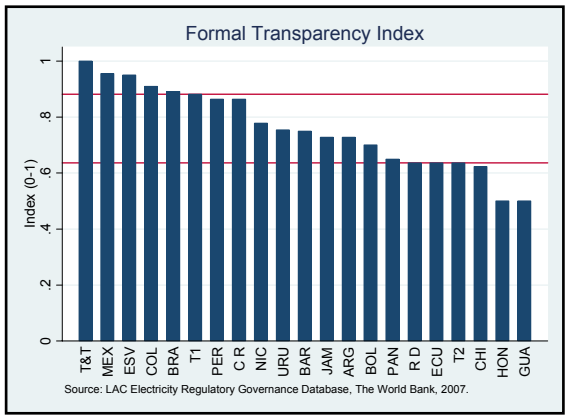
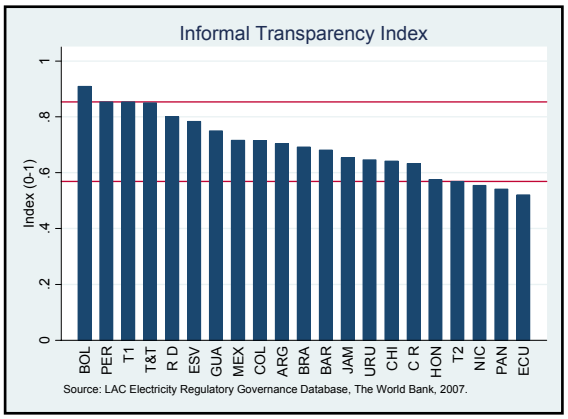


Figure 17: Formal Transparency Index



[8] The World Bank Government Effectiveness indicator measures the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of the government's commitment to such policies. It is the result of a large number of individual data sources that provide information on perceptions on governance (Kauffman, 2006).

The disassociations between the formal and informal aspects of agencies' mechanisms and procedures to achieve transparency might be explained by two factors: 1) not all agencies' procedures translate into practice (for instance, the mere existence of the agency's annual report vs. its publication on the agency's website or bulletin); and 2) the agency has developed good practices of transparency that are not established in the agency's statute or the electricity law. This is the case of Bolivia and Guatemala, whose positions drastically change from formal to informal transparency. Bolivia moves from a score of 0.7 in formal transparency to the first place in informal transparency (0.9). Guatemala leaves the last position in the formal transparency index (0.5) to reach the sixth place (0.75) in the Informal Transparency Index.

Consistent with the Transparency Index, Trinidad and Tobago heads the Formal Transparency Index, reaching one of the leading positions in informal transparency.

4.3.3 Accountability:

Accountability was not disaggregated into different aspects. Its indicators represent different institutional elements (*e.g.* reporting obligations to the Executive and the Parliament and ability to appeal its decisions before the Executive and the Judiciary) of the agency's relationships with the Executive, the Legislative, and the Judiciary. Hence, we only considered the institutional aspect of agencies' accountability design.

Our benchmark of analysis gives higher scores to the dual accountability of the agency to the Executive and the Legislative, with stronger influence of the latter. Moreover, it emphasizes the appeal of the agency's decisions before the judiciary, giving a lower score to agencies whose decisions need a previous denial from the Executive before the judicial review.

Figure 18: Accountability Index



Trinidad and Tobago is the only country in Tier 1, showing a desirable governance design and practices to keep the agency accountable to institutional actors. Different from other indexes, there are a vast number of countries that are under Tier 3. Chile, Panama, and Honduras are the countries with the lowest results. The situation of Chile among Tier 3 countries might be due to the oversight of the agency by the Executive and not the Parliament. Nevertheless, we do not make a judgment regarding the effectiveness of Chile's accountability mechanism. We limit our assessment to establish whether agencies are subject to stronger controls by the Executive or the Legislative,

assuming that in LAC countries a deeper level of accountability to the Executive might affect the autonomy of the agency.

A. Formal vs. informal:

The formal aspects of agencies' accountability reflect the existence of agencies' internal and external (Executive, Legislative and Judicial branches) structures for accountability, while informal aspects are related to the implementation of provisions in their statutes or laws. For instance, while question 51 of the ERGI asks the agency whether it is accountable to the Executive or the Legislative branch, question 52 of the ERGI explores the actual reporting obligations of the agencies before one or the other branches of government.

Disparities between the formal and informal aspects of accountability are the largest among all variables. As mentioned previously, the driving factors of those disparities are the types of reporting instruments the agency must use and the types of obligations of the regulator before the Executive and the Legislative. It is important to highlight that the ERGI is oriented towards an accountability mechanism based on legislative control over the agency, with only informational reporting obligations to the Executive. Hence, an agency will achieve a higher score in the informal accountability index if it is fully accountable to the Legislative and only subject to informative reporting obligations to the Executive. Also, and in connection with the agencies' reporting instruments, the ERGI gives higher scores to an accountability scheme that combines hearing obligations before the Parliament with an annual report of its performance.

Figure 19: Formal Accountability Index



Figure 20: Informal Accountability Index



Countries at the top of the Formal Accountability Index have only informational reporting obligations to the Executive and, particularly in the case of Trinidad and Tobago, the obligation to submit a report that must be approved by the Parliament. Their agencies are also required to submit an annual report and their directors are subject to public hearings before the Congress. Countries that do not meet the minimum requirements to implement this accountability scheme are the Dominican Republic, Jamaica, Honduras, Chile, and Uruguay.

When it comes to the practices that characterize agencies' accountability, only two countries, Trinidad and Tobago and Guatemala, are among agencies with desirable levels of informal

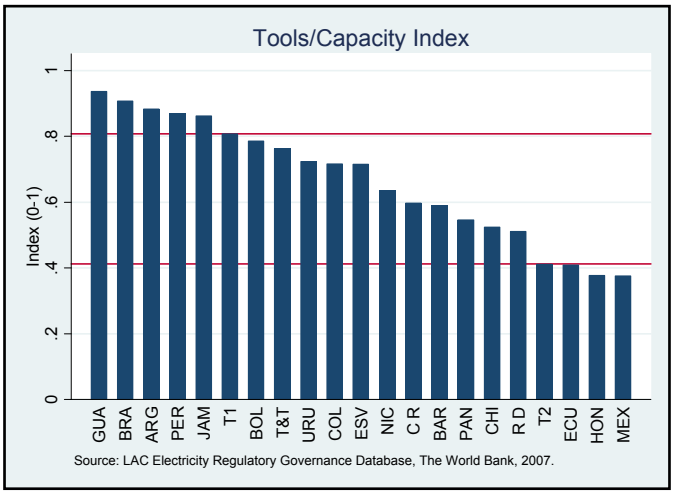
accountability. Particularly significant is the number of countries that is below the minimum conditions to implement appropriate procedures of accountability. Among them, countries with the lowest levels of informal accountability are Chile and Panama. In the case of Chile, both agencies (the National Energy Commission and the Electricity and Gas Supervision Agency) are fully accountable to the Executive, only reporting through annual reports. Panama's performance in the informal accountability index is also explained by its accountability to the Executive and the use of just an annual report for that obligation. Furthermore, it is explained by the low levels of independence of the office in charge of internal auditing.

4.3.4 Regulatory, Management, and Institutional Tools:

The fourth variable of analysis is the Tools Index, which encompasses the instruments available to agencies to perform their duties, including those aimed at improving not only regulatory actions but also institutional development.

Among the different countries that compose the index, only Guatemala, Brazil, Argentina, Peru, and Jamaica qualify as countries in Tier 1 of the Index. With different degrees, they meet "desirable" tools and procedures to achieve a good regulatory management. On the contrary, Ecuador, Honduras, and Mexico have agencies that do not meet the minimum requisites of the index.

Figure 21: Tools Index



It is interesting to highlight that Colombia and Chile improve their previous positions compared to other indexes such as autonomy. This fact can be explained by the emphasis given by these agencies to develop regulatory capacities and not necessarily to procedures that guarantee its independence from policy formulation authorities.

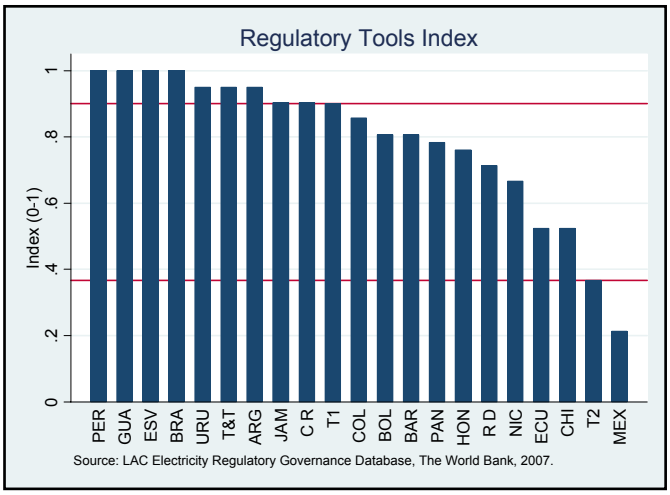
In order to assess agencies' performance in this variable, we divided its indicators into two components. The first component, regulatory tools, includes instruments related to the conduct of regulatory policies. It includes mechanisms such as benchmarking, the methodology for tariff revision, and instruments that regulate consumers' rights. The second component, institutional tools, involves instruments aimed at improving the institutional development of the agency's management and its decisions. It includes mechanisms such as regulatory quality standards, public consultations, the structure of posts and salaries, performance-based salaries (incentives) for employees, the use of

a website, the mechanisms to register consumer complaints, the agency's annual report and institutional strategy, and employees' training.

A. Regulatory tools:

The region shows a better performance in regulatory than in institutional tools. Benchmarking, mainly to determine tariffs, is used in 78 percent of the region, with a smaller percentage of countries having the full complement of tools listed in the survey (See question 73 of the survey).

Figure 22: Regulatory Tools Index



A significant number of countries are in Tier 1, reflecting the importance given by LAC agencies to the development of several tools to implement their regulatory decisions. Peru, Guatemala, El Salvador, and Brazil achieve full score leading those countries grouped in Tier 1. Mexico is the only country that is in Tier 3 and which does not meet the minimum requirements demanded in this index.

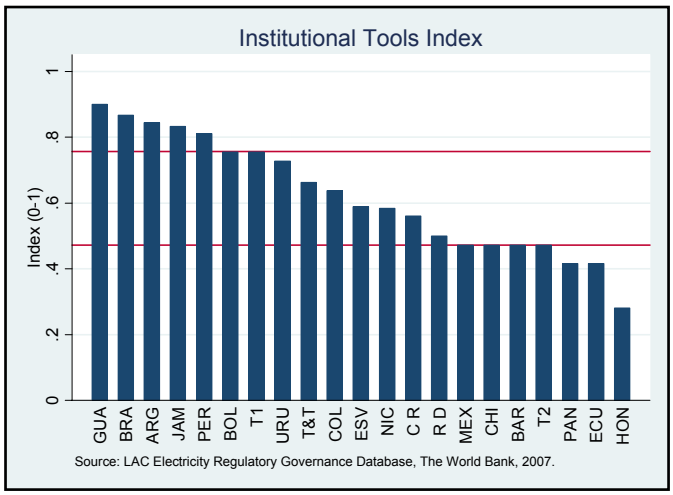
Leading countries in this index make use not only of benchmarking but also of tools to conduct regulatory policies such as a database for regulatory accountability, methodology for tariff revision, methodology for annual tariff readjustment, instruments for monitoring quality and technical standards, methodology for monitoring technical standards, methodology for defining interconnection tariffs, and five-year revisions of these tools. Moreover, 90 percent of the countries in the region have developed specific legislation to regulate electricity consumers' rights.

Countries at the bottom of the index differ in their performances. While none of them make use of benchmarking, Ecuador and Chile achieve average scores in regulatory instruments with Mexico having the lowest results in this last indicator. The poor performance of Mexico in this aspect might be related to the lack of reforms in the electricity sector and the concentration of tariff determination powers in the sector ministry. A large percentage of the tools in the index are related to tariff determination and readjustment.

B. Institutional tools:

As mentioned before, countries of the region present higher scores in regulatory tools than in those indicators grouped under institutional tools. Leading countries are Guatemala, Brazil, Jamaica, and Peru. Countries with the lowest scores are Panama, Ecuador, and Honduras.

Figure 23: Institutional Tools Index



There are large disparities between countries at the top and the bottom of the index. Guatemala, Brazil, Jamaica, and Peru have certain regulatory quality standards tools (cost-benefit analysis, regulatory impact analysis, and administrative simplification), the full use of performance-based payments for their employees, the publication of both annual reports and institutional strategies and, with the exception of Peru, a structure of posts and salaries. By contrast, worst performing countries lack regulatory quality standards, do not use incentives for their employees, and have not developed institutional strategies. In addition, the registration of consumer complaints is facilitated through paper-based mechanisms, not using electronic devices to perform that task.

It is worth highlighting the use of regulatory impact analysis (RIA) by countries such as Mexico and Peru. In fact, Mexico's regulatory impact analysis was praised by the OECD, which has considered the use of Mexican's RIA as a benchmark in the management of cost-benefit analysis of regulations (OECD, 1999). The impact analysis of regulations in Mexico is done by a centralized body of the public administration, the Federal Commission for Regulatory Improvement (COFEMER), which performs cross-sectoral assessments on the impact of administrative decisions.

5. - ROBUSTNESS:

We practiced two exercises to test the robustness of the Electricity Regulatory Governance Index (ERGI). Both exercises involved giving different weights to each of the variables of our regulatory governance framework.

First, we assigned arbitrary weights to some variables. We assigned autonomy 40 percent of the total weight, and transparency, accountability, and tools were each given 20 percent. Moreover, within autonomy, the question related to tariff regulation (agency's decision responsibilities in tariff structure and level) bears 50 percent of the total weight of the index. The rationale to this approach

is to emphasize autonomy and, within autonomy, the regulation of tariffs, before other aspects of governance design.

Table 3: Robustness analysis (with a different definition of weights)

	New Index		ERGI
1	T. AND TOBAGO	0.91	T. AND TOBAGO	0.88
2	BRAZIL	0.88	BRAZIL	0.85
3	BOLIVIA	0.87	BOLIVIA	0.84
4	PERU	0.86	PERU	0.83
5	EL SALVADOR	0.85	EL SALVADOR	0.82
6	GUATEMALA	0.83	GUATEMALA	0.79
7	BARBADOS	0.8	ARGENTINA	0.77
8	COLOMBIA	0.8	BARBADOS	0.76
9	R. DOMINICANA	0.8	COLOMBIA	0.75
10	NICARAGUA	0.79	R. DOMINICANA	0.75
11	COSTA RICA	0.79	NICARAGUA	0.74
12	JAMAICA	0.77	COSTA RICA	0.74
13	ARGENTINA	0.72	URUGUAY	0.72
14	PANAMA	0.7	MEXICO	0.72
15	HONDURAS	0.64	JAMAICA	0.72
16	ECUADOR	0.58	PANAMA	0.63
17	URUGUAY	0.58	ECUADOR	0.6
18	MEXICO	0.57	CHILE	0.56
19	CHILE	0.44	HONDURAS	0.56

Table 3 shows no significant variations between the results of the ERGI and the new index. Countries at the top of both indexes keep their same positions. The main differences took place in countries below T2 where Mexico and Uruguay joined Chile as countries with the lowest scores. The main reason behind this change is the focus on tariff regulation and the lack of regulatory competencies on this matter by electricity agencies in Mexico and Uruguay.

The second exercise is more complex and it involved the use of Principal Component Analysis. Principal Component Analysis (PCA) develops a composite index by defining a real valued function over the relevant variables objectively. The principle of this method lies in the fact that when different characteristics are observed about a set of events, the characteristic with higher variation explains a higher proportion of the variation in the dependent variable compared to a variable with lesser variation. Therefore, the issue is one of finding weights to be given to each of the concerned variables determined on the principle that the objective is to maximize the variation in the linear composite of these variables. In other words, this approach allows for identifying patterns in data, and expressing the data in such a way as to highlight their similarities and differences. Since patterns in data can be hard to find in data of high dimension, PCA may contribute in analyzing data. Furthermore, an additional advantage of PCA is that once you have found these patterns in the data, you may compress the data by reducing the dimensions, without much loss of information.

We use PCA to jointly take into account the information provided by our eight main governance indicators ratios (Figure 4) and generate orthogonal indexes to measure regulatory agencies' governance. Factor scores were then calculated for each of the agencies, and these scores were used

for comparing their governance. As a first step, we determine how many factors we may use in our analysis. Table 4 reports the estimated factors and their eigenvalues. Only those factors accounting for greater than 10 percent of the variance (eigenvalues >1) are kept in the analysis. As a result, only the first three factors are finally retained (Table 4).

Table 4: Eigenvalues of factors

Component	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	3.84	2.62	0.48	0.48
Factor 2	1.21	0.10	0.15	0.63
Factor 3	1.12	0.54	0.14	0.77
Factor 4	0.58	0.12	0.07	0.84
Factor 5	0.46	0.11	0.06	0.90
Factor 6	0.35	0.08	0.04	0.94
Factor 7	0.27	0.09	0.03	0.98
Factor 8	0.18	.	0.02	1.00

Among them, the first principal component factor (F1) accounts for 48 percent of the variance of the seven indexes. The other two component factors (F2 and F3) account for 15 and 14 percent of the variance respectively. The three factors together account for 77 of the total variance. These factors allow for computing the factor score coefficient matrix. To enhance these factors' interpretability, we use the varimax factor rotation method to minimize the number of variables that have high loadings on a factor. In other words, varimax rotation produces results which make it the most likely to identify each variable with a single factor. This approach greatly enhances our ability to make substantive interpretation of the main factors. Table 5 presents the factor loadings, where variables with large loadings (N>0.4) for a given factor are highlighted in bold.

Table 5: Factor loadings of indexes after varimax rotation

Variable	Factor 1	Factor 2	Factor 3	Unexplained
Tariff regulation Index	-0.078	0.019	**0.702**	0.188
Informal Autonomy Index	-0.162	**0.499**	0.147	0.310
Informal Transparency Index	0.228	**0.447**	-0.083	0.274
Informal Accountability Index	0.116	**0.504**	-0.099	0.294
Tools/Capacities Index	-0.110	**0.538**	0.049	0.288
Formal Autonomy Index	0.122	-0.003	**0.629**	0.199
Formal Transparency Index	**0.687**	0.046	-0.149	0.173
Formal Accountability Index	**0.635**	-0.080	0.220	0.108

As seen on Table 5, Factor 1 reflects formal aspects of regulatory governance and is highly correlated with formal transparency and formal accountability. As this factor explains almost half of the variance in the data, it constitutes the most informative indicator of the agencies' governance. Factor 2 reflects informal aspects of governance as it is correlated with informal autonomy, informal transparency, informal accountability, and tools and capacities. Factor 3 reflects formal aspects of autonomy and the formal power of the agency to determining tariff's structure and level. This factor is highly correlated with the tariff regulation and the Formal Autonomy Index.

In order to facilitate analysis and interpretation, we further standardize the factors scores assigned to each agency along the 0-10 scale[9]. In addition, we develop an aggregate index composed of the three principal factors, according to their particular weights. These findings are presented in Table 6

[9] Following Shih et al (2007) we convert the factor as $\frac{X_i - X_{\min}}{X_{\max} - X_{\min}} \times 10$

where higher values indicate higher governance in a given factor and in the aggregate index. As we did in the previous sections we distinguish three tiers or groups of countries. Hence, we divide agencies among those with desirable conditions to develop good regulatory governance (T1) and those that only meet the minimum conditions (T2) below which agencies show serious deficiencies.

Table 6: Standardized scores for each Regulatory Agency

	Factor 1 (standardized)		Factor 2 (standardized)		Factor 3 (standardized)		Aggregated Index (standardized)	
1	**T. AND TOBAGO**	**10.00**	**T. AND TOBAGO**	**10.00**	**NICARAGUA**	**10.00**	**T. AND TOBAGO**	**10**
2	**GUATEMALA**	**9.77**	**MEXICO**	**9.52**	**PERU**	**9.81**	**BOLIVIA**	**9.51**
3	**BOLIVIA**	**9.67**	**EL SALVADOR**	**9.20**	**BOLIVIA**	**9.66**	T1	9.28
4	T1	9.24	T1	8.57	**BRAZIL**	**9.28**	BRAZIL	8.82
5	BRAZIL	8.57	COLOMBIA	8.39	**PANAMA**	**9.25**	PERU	8.58
6	PERU	8.03	PERU	8.25	**R. DOMINICANA**	**9.24**	GUATEMALA	8.2
7	ARGENTINA	7.73	BRAZIL	7.92	**EL SALVADOR**	**8.91**	EL SALVADOR	7.84
8	URUGUAY	7.72	BOLIVIA	6.78	**BARBADOS**	**8.67**	ARGENTINA	6.83
9	R. DOMINICANA	7.08	BARBADOS	6.71	T1	8.34	R. DOMINICANA	6.74
10	EL SALVADOR	7.07	COSTA RICA	6.35	COSTA RICA	8.28	BARBADOS	6.27
11	JAMAICA	6.05	NICARAGUA	5.25	GUATEMALA	7.73	NICARAGUA	5.75
12	BARBADOS	5.81	ARGENTINA	4.40	JAMAICA	7.53	COSTA RICA	5.71
13	COSTA RICA	5.30	ECUADOR	4.20	T. AND TOBAGO	7.44	COLOMBIA	5.58
14	NICARAGUA	5.19	T2	4.11	ARGENTINA	6.60	JAMAICA	5.32
15	COLOMBIA	5.11	R. DOMINICANA	3.74	COLOMBIA	6.29	URUGUAY	5.29
16	MEXICO	3.48	PANAMA	3.00	HONDURAS	6.15	MEXICO	3.94
17	T2	1.78	JAMAICA	2.57	ECUADOR	5.99	PANAMA	2.43
18	PANAMA	1.76	GUATEMALA	2.26	T2	4.54	T2	1.69
19	CHILE	1.54	URUGUAY	1.89	MEXICO	3.41	HONDURAS	0.91
20	HONDURAS	1.49	CHILE	1.63	URUGUAY	1.94	ECUADOR	0.62
21	ECUADOR	0.00	HONDURAS	0.00	CHILE	0.00	CHILE	0

The aggregated index reflects countries' levels of regulatory governance after the three factors were integrated in a sole index. Electricity agencies in Trinidad and Tobago and Bolivia appear to be the entities with desirable governance conditions. Brazil and Peru, although in the range of Tier 2 countries, are also close to Tier 1. Countries' positions in this index are explained by 1) higher levels of formal transparency and accountability, and, in a less extent, by 2) higher levels of informality in autonomy, transparency, and accountability, and tools, and by 3) levels of formal autonomy and tariff regulation. As in the ERGI, the majority of countries in the LAC region only meet the minimum governance conditions to implement an independent regulatory agency model while Honduras, Ecuador, and Chile show the largest deficiencies among agencies. Results are consistent with the Formal Transparency and Accountability Indexes where Honduras, Ecuador, and Chile have the lowest scores.

Results in Factor 1 do not change considerably compared to the aggregate index. Trinidad and Tobago, Bolivia, and Guatemala have agencies with desirable governance conditions in terms of their formal mechanisms for transparency and accountability. On the other hand, Panama, Chile, Ecuador, and Honduras are below Tier 2 countries, with important deficits in transparency and accountability.

The consideration of transparency and accountability as the main components that explain governance variations in the LAC region could be considered as a pattern related to agencies' institutional quality. In other words, the main objective of tools and procedures is to increase the agency's administrative capacities towards a more transparent management. This is particularly important if we think that most of the agencies in the region were installed as independent agencies whose main goal was to isolate regulatory decisions from political intervention but were not given adequate tools to involve users effectively or to improve its institutional development. Nevertheless, both formal transparency and accountability only reflect governance aspects related to the design of the agencies or their procedures yet say little about their practices.

This is particularly reflected in Factor 2, where informal autonomy, transparency, accountability and tools account for 15 percent of the variance. In this index Trinidad and Tobago remains the leading country. Nevertheless, Tier 1 countries change considerably and countries below Tier 2 become the largest among all three factors. El Salvador and Mexico, together with Trinidad and Tobago, present the best scores.

The case of Mexico is particularly striking if we compare its low position with the rest of the factors and in the aggregate index. When it comes to several aspects of informality (autonomy, transparency, accountability) and the agency's tools/capacities, Mexico is among Tier1 countries. Nevertheless, it holds a relatively low position in factors 1 and 2, both the manifestations of formal governance and of the competence of the agency to regulate tariffs.

The second observation from Factor 2 is the significant number of countries that are below Tier 2 agencies. Seven countries, almost double in the other factors and in the aggregate index, do not meet the minimum criteria in terms of some of the practices related to autonomy, transparency, accountability, and tools. Although factor 2 only explains 15 percent of the governance variations in the region, it is also an interesting observation to highlight the paradoxical situations of countries such as Guatemala that are among Tier 1 in terms of formal attributes, particularly transparency and accountability, but which have a low performance in terms of its governance practices.

Factor 3 reflects governance aspects related to the design of the agency's procedures to guarantee its autonomy and the agency's power to regulate tariffs. Both aspects are related to the Formal Autonomy Index and have no correlation with the agency's practices. Factor 3 shows the largest number of agencies among Tier 1 countries (Nicaragua, Peru, Bolivia, Brazil, Panama, the Dominican Republic, El Salvador, and Barbados).

A possible interpretation to results in Factor 3 could be the emphasis given by regulatory frameworks of the region to the autonomy of the agency from political authorities, particularly in terms of the determination of tariffs. This assumption can be confirmed by the positions of countries such as Mexico and Uruguay. Both in Mexico and Uruguay, the government has significant powers in the regulation of the sector, particularly in the determination of prices. Although separate from the government, regulatory agencies in these two countries are typically under the administrative hierarchy of the line Minister and, hence, subject to its authority in the decision of relevant issues. A similar explanation applies to Chile. This said, factor 3 only explains formal attributes and is not a reflection of the agency's practices which is particularly addressed by Factor 2.

6. CONCLUSION:

The governance assessment of LAC electricity regulatory agencies analyzed regional trends in terms of four dimensions of their institutional design: autonomy, transparency, accountability, and tools. In doing so we used one main methodology and tested its robustness with positive results. The main methodology involved the consideration of autonomy, transparency, accountability, and tools as variables with equal weights, giving each of them and their indicators a value between 0 and 1. We created a main aggregated index (ERGI) and different indexes according to the different aspects of governance. In order to test the robustness of that approach, we used Principal Component Analysis (PCA) and assigned variables different weights. We created a main index, Aggregate Principal Index (API), composed of the governance variables with the highest variance. Results were similar in both approaches. Countries at the top and the bottom of the ERGI kept their positions in the API, with small variations among countries in the middle of the ranking.

In an attempt to distinguish LAC countries in different levels, we created three tiers of agencies. The first tier, countries above T1, represents agencies with desirable levels of governance. The second tier, countries between T1 and T2, represents countries with minimum governance levels. The third tier, countries below T2, represents countries that do not meet the minimum governance attributes as indicated in our framework. Our benchmark to assess the regulatory governance of electricity agencies was the independent regulator model.

In both general indexes (ERGI, API), Trinidad and Tobago's Regulated Industry Commission is the agency with the highest standards of regulatory governance. Despite the regulated utility is a State-Owned-Enterprise (SOE), the agency shows important levels of transparency and accountability, both in its design (formal governance) and in its practices (informal governance). This is observed not only in the different indexes that compose the ERGI but also in the different principal factors that were identified in the PCA. Brazil's ANEEL, Bolivia's SUPERELE, and Peru's OSINERG are agencies that in some of our indexes are among Tier1 countries. Ecuador's CONELEC, both Chile's SEC and CNE, and Honduras' CNE are agencies that score low in our regulatory governance framework. In the particular case of Chile, this is mostly due to the fact that this country has not implemented the model of independent agency and, hence, it shows a low performance in the majority of the indexes, particularly when it comes to autonomy, transparency, and accountability.

The rest of the countries vary with different degrees among Tier 2 agencies. Although Tier 1 countries usually head the first places in the rankings, some Tier 2 countries also reach top positions in particular aspects. This is particularly the case in the Managerial Autonomy Index and the Regulatory Autonomy Index, where the majority of countries are among T1 agencies.

Our approach allowed us to observe four main patterns in the governance of electricity regulatory agencies in the LAC region:

Regulatory agencies in the LAC region were originally created to isolate regulatory decisions from political intervention and this has been reflected in their governance design. Regardless of the translation of their governance design into practice, there is a significant number of agencies with relevant regulatory powers (Regulatory Tools Index of the ERGI and Factor 3 of the API) and mechanisms to guarantee its flexible management (Managerial Autonomy Index). Around 75 percent of the agencies in the region have final decision responsibilities in the determination of tariff structure and levels. Moreover, almost all the agencies have significant attributes regarding their employees. Likewise, Factor 3 of the PCA, which reflects Formal Autonomy and Tariff Regulation, shows the largest number of agencies among Tier1 countries.

Nevertheless, the region has experienced difficulties in the implementation of the safeguards to guarantee the autonomous management of agencies. Factor 2 of the PAI and the Political Autonomy Index show the largest number of agencies among Tier 3 countries. In the former, which accounts for 14 percent of the variance in governance variables and reflects informal autonomy, transparency, accountability, and tools, almost 40 percent of the countries do not meet minimum governance conditions. In the latter, almost 70 percent of the countries do not meet the minim governance requirements to guarantee the insulation of the agency from politics. Moreover, the Informal Accountability Index, which assesses the degree of agency's accountability to the Executive, shows a large number of agencies (almost half of the agencies) below T2.

Regulatory agencies of the region do not show a positive performance on institutional, non-regulatory, mechanisms aimed at improving its transparency and overall institutional quality.

Different from other countries where the regulatory agency model had a better fit, particularly Anglo-Saxon countries such as the United Kingdom and Australia, in the LAC region the role of independent agencies beyond regulatory responsibilities was poorly defined and understood. For instance, the use of regulatory quality standards such as administrative simplification or the use of cost-benefit analysis in the assessment of regulations has not, with exceptions, been reflected in their governance. Moreover, 30 percent of agencies do not publish their job vacancies and almost 50 percent do not use public examinations to hire employees.

These aspects have been reflected in the Institutional Transparency Index where around 40 percent of the agencies are below T2 countries. This index assesses the institutional side of transparency and includes indicators related to the ways the agency reports its performance, the publication of their financial accounts, the use of norms of ethics, and the publication of their vacancies. Factor 2 of the PCA, which includes informal autonomy, transparency, and accountability, also shows a large percentage (40 percent) of agencies below T2 levels. Moreover, Factor 1 of the PCA indicates formal transparency, together with formal accountability, as the variable with the largest variance and the one that better explains regulatory governance among electricity agencies of the LAC region.

The implementation of the independent agency model is context dependent. The independent regulator model is an Anglo-Saxon institution which is, in principle, strange to most LAC legal and institutional regimes. The latter, which adopted the rigid and formalistic French administrative system, had to redefine the delegation of administrative powers to more independent and powerful regulatory agencies. This might be reflected in the fact that Anglo-Saxon countries of the Caribbean (Trinidad and Tobago, Barbados, and Jamaica) have, in average, better scores than the non Anglo-Saxon countries of the region. In some Latin American countries, independent agencies became an appendix to the line Minister, being only responsible for technical aspects of regulation. Yet, this observation does not aim to hide important achievements that many LAC countries have reached in their efforts to strength independent agencies.

Appendix 1: Characteristics of LAC electricity agencies that submitted the survey.

Name	Year	Legal status	Budget sources	Appeals' authority	Accountability	Staff number
Ente Nacional Regulador de la Electricidad (Argentina)	1993	Separate entity with autonomy from the line ministry	Regulation tax	Executive and Judicial reviews[10]	Executive and Congress	More than 100
Fair Trading Commission (Barbados)	2001	Separate entity with autonomy from the line ministry	Government budget and regulation tax	Judicial review	Executive and Congress	29
Superintendencia de Electricidad (Bolivia)	1996	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Executive and Congress	68
Agencia Nacional de Energía Eléctrica (Brazil)	1997	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Executive and Congress	765
Comisión de Regulación de Energía y Gas (Colombia)	1994	A separate entity with no autonomy from the line ministry	Regulation tax	Judicial review	Executive and Congress	From 51 to 100
Superintendencia de Servicios Públicos (Colombia)	1994	A separate entity with autonomy from the line ministry	Government budget	Judicial review	Executive and Congress	305
Unidad Reguladora de Servicios Públicos (Costa Rica)	1996	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Congress	167
Comisión Nacional de Energía (Chile)	1978	Separate entity with no autonomy from the line ministry	Government budget	Cuasi-judicial review (Autonomous Oversight Agency)	Government	44
Superintendencia de Electricidad y Combustibles (Chile)	1985	Separate entity with autonomy from the line ministry	Government budget	Cuasi-judicial review (Autonomous Oversight Agency)	Government	More than 100
Consejo Nacional de Electricidad (Ecuador)	1999	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Government	100
Superintendencia de Electricidad (Republica Dominicana)	1998	Separate entity with autonomy from the line ministry	Regulation tax	Executive and Judicial reviews	Government and Congress	More than 100
Superintendencia General de Electricidad y Telecomunicaciones (El Salvador)	1997	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Government and Congress	106
Comisión Nacional de Energía Eléctrica (Guatemala)	1996	Separate entity with no autonomy from the line ministry	Regulation tax	Executive and Judicial reviews	Government and Congress	From 51 to 100
Comisión Nacional de Energía (Honduras)	1995	Separate entity with autonony from the line ministry	Government budget	Judicial review	Government and Congress	Fewer than 20
Office of Utilities Regulation (Jamaica)	1997	Separate entity with autonomy from the line ministry	No answer	Judicial review	Government and Congress	45
Comisión Reguladora de Energía (México)	1995	Separate entity with autonomy from the line ministry	Government budget	Judicial review	Government and Congress	130
Instituto Nicaragüense de Electricidad (Nicaragua)	1994	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Government and Congress	200
Autoridad Nacional de los Servicios Públicos (Panamá)	1996	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Government	More than 100
Organismo Supervisor de la Inversión en Energía (Perú)	1996	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Government and Congress	187
Regulated Industries Commission (Trinidad and Tobago)	2000	Separate entity with autonomy from the line ministry	Regulation tax	Judicial review	Government and Congress	Fewer than 20
Unidad Reguladora de Servicios de Energía y Agua (Uruguay)	2000	Separate entity with no autonomy from the line ministry	Regulation tax	Executive and Judicial review	Government and Congress	18

[10] Executive review generally involves the line minister or the President as the authorities in charge of reviewing an agency's decision. Judicial review implies the revision of the decision by a court.

Section II: the survey's structure:

Information:

Regulatory Agency_____
Country/province_____
Name_____
Position in the agency_____
Telephone number_____
E-mail_____

I. General questions:

1. Has the Parliament passed any framework laws aiming at reforming the electricity sector? (please, identify year and laws' numbers)

Yes ☐ No ☐

Laws and year_____
_____

2. When did the electricity sector reform actually start? (please, specify year)

_____

3. Does the law explicitly forbid operators from joint ownership of electricity services (such as generation, transmission, distribution and retail/supply)?

Yes ☐ No ☐

4. Does the law allow the entry of new private power companies?

Yes ☐ No ☐

5. Are there tariffs specially designed to assist low-income households? (please, specify type and methodology)

Yes ☐ No ☐

6. Which is the year the agency was created?

_____

7. Which is the year the agency was established?

_____

8. What are the mission/objectives of the agency?

_____
_____
_____

9. Is it a sectoral or multi-sectoral agency?

_____

10. What are the sectors/industries over which the regulatory agency has authority?

_____
_____
_____
_____

11. In case the sector was privatized, what type of norm was utilized for its privatization? (please, identify the year)

A law ☐ A decree ☐ A Ministerial regulation ☐ Other ☐

Number and year_____

12. When did the electricity distribution concessionaries take power of the former state-owned-companies?

_____
_____

13. Please, select the types of electric sector markets that apply in your country.

Bilateral contracts ☐ Pool ☐ Forward market ☐ Balancing market ☐ Other ☐

If other, please define the type of market_____

14. Please, select the degree of electricity market liberalization in your country.

Full liberalization ☐ Gradual liberalization ☐ No liberalization ☐ Other ☐

15. Please, cite the number and ownership of transmission and distribution utilities in your country.

Number: a) Transmission:_____
b) Distribution:_____

Ownership: a) Transmission: Company 1_____
Company 2_____
Company 3_____
Company 4_____
Company 5_____

b) Distribution: Company 1_____
Company 2_____
Company 3_____
Company 4_____
Company 5_____

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

Vertically integrated monopoly ☐ Single buyer market ☐ Wholesale competition ☐

Supply/Retail competition ☐ Other ☐

17. When was vertical separation first established? (please, specify the year)

_____

18. Are consumers allowed to choose among electricity suppliers?

Yes ☐ No ☐

19. What is the price control method?

Revenue cap ☐ Price cap ☐ Rate of return ☐ Other ☐

If other, please cite the applied method_____

II. Agency's governance variables:

A. AUTONOMY:

20. What is the legal instrument that created the agency? Please, identify number and year.

Law ☐
Number/Year_____

Decree ☐
Number/Year_____

Ministerial regulation ☐
Number/Year_____

Other (please, specify)_____

21. What is the legal status of the agency?

It is a separate entity with autonomy from the line ministry ☐

It is a separate entity with no autonomy from the line ministry ☐

There is no agency ☐

Other (please, specify)_____

22. Does any authority have the power to intervene the agency? Please, specify which authority.

Yes ☐
Authority_____

No ☐

23. Has the agency been intervened in the last five years?

No ☐ Yes ☐
Number of interventions:_____

24. Can the Minister give instructions to the agency?

Yes ☐ No ☐
Type of instructions:_____

25. Which body is competent for regulation in the sector?

Agency only ☐

Agency and another independent agency ☐

Agency and Parliament ☐

Agency and government ☐

Agency has only consultative competencies ☐

26. Is there separation of roles between the Ministry and the regulatory agency? If Yes, please specify a) which is the legal instrument that establishes this separation and a) which competencies correspond to the ministry and which to the agency.

Yes ☐ No ☐

27. Are the objectives of the regulatory agency clearly established?

Yes ☐ No ☐

28. Is the independence of the regulator explicitly established?

Yes ☐ No ☐

_____

29. Have there been any major changes in the past 3-5 years in the responsibilities of the regulatory agency?

No ☐

Yes, responsibilities have increased ☐

Yes, responsibilities have decreased ☐

30. What are the agency's regulatory powers?

Advisory power ☐

Supervisory power ☐

Licensing/ pricing ☐

Rule-making ☐

31. Who has the legal responsibility for making decision on the following issues?

	Agency	Minister	None
Tariff structure	☐	☐	☐
Tariff level	☐	☐	☐
Service quality	☐	☐	☐
Consumer complaints	☐	☐	☐
Sector expansion plans	☐	☐	☐
Investment plans (ex-ante approval)	☐	☐	☐
Investment plans (e.g. ex post prudence review)	☐	☐	☐
Wholesale market structure	☐	☐	☐
Anti-competitive behavior	☐	☐	☐
Merger/acquisition reviews	☐	☐	☐
Technical and safety standards	☐	☐	☐

32. How do you evaluate the degree of interference by the minister in the agency's regulatory decisions?

Very high ☐

High ☐

Medium ☐

Low ☐

Very low ☐

33. Does the agency have the power to enforce sanctions and regulations?

Yes ☐ No ☐

34. Which is the mechanism for the selection of the agency's director/s?

The Minister appoints the members of the Board/Director ☐

The President appoints the members of the Board/Director ☐

The President with the authorization of the Congress ☐

Other (please, specify)_____

35. Please, assign a value between 1 (highest) and 0 (lowest) to the following aspects of the Board's members selection process?

Transparency ☐

Merit-based ☐

Insulation from politics ☐

36. What are the requirements to be appointed as director?

University degree ☐

Experience in regulation ☐

Independence ☐

There are no requirements ☐

Other (please, specify)_____

37. What is the length of the mandate of a Director?

Fixed terms ☐

Number of years_____

Indefinite periods ☐

38. Is it renewable? For how long?

No ☐

Yes, for one more period ☐

Yes, for more than one period ☐

39. Since the creation of the agency, how many directors have not completed their terms?

Less than five ☐

Number of directors_____ _____

More than five ☐

Number of directors_____

40. Has the mechanism for the dismissal of directors ever been used?

Yes ☐

How many times? _____

No ☐

There are no mechanisms for the dismissal of directors ☐

41. **Select the reasons by which directors leave their positions:**

	Yes	No
Dismissal	☐	☐
External pressure	☐	☐
Retirement	☐	☐
Voluntary leave	☐	☐
End of mandate	☐	☐

42. **Does the agency have the power to organize its administrative/organizational structure?**

Yes ☐

No ☐

If no, please specify which is the authority responsible for that_____

43. **What is the regime that regulates the agency's employment policies?**

Private Law ☐

Civil Service law ☐

Both ☐

44. **Identify the laboral regime that regulates the following situations:**

	Private law	Civil Service Law
Directors	☐	☐
Managers	☐	☐
Technical employees	☐	☐
Rest of the staff	☐	☐
Other/s		
_____	☐	☐
_____	☐	☐

45. **Is the agency free to make its own personnel decisions? (e.g. hire, promote, discipline)**

Yes ☐ No ☐

If no, please identify the authority with the power to make those decisions_____

46. **What are the sources of the agency's budget? Identify the percentages of each source.**

	Percentage	Yes	No
Government budget	_____	☐	☐
Fines	_____	☐	☐
Donations	_____	☐	☐
Transfers from the federal agency	_____	☐	☐
Regulation tax	_____	☐	☐
Others			
_____	_____	☐	☐
_____	_____	☐	☐

47. **Does the agency have financial autonomy to determine its own expenses?**

Yes ☐ No ☐

If no, please identify the authority with the power to determine the agency's expenses_____
_____

48. **What has been the evolution of the budget in the last three years?**

It has expanded ☐

It has shortened ☐

There have been no changes ☐

B. ACCOUNTABILITY:

49. **What are the competencies of the regulatory agency in anti-trust matters related to utility regulation?**

Final decision ☐

Advisory ☐

The agency has no competencies in anti-trust matters ☐

50. **Do federal and state regulatory agencies coordinate their regulatory actions?**

Yes ☐ No ☐

If yes, please specify how is coordination operationalized_____

51. To whom is the agency accountable?

The Parliament ☐

The government ☐

Both ☐

It is not accountable ☐

52. What are the formal obligations (in law or in statue) of the agency vis-à-vis the executive government?

No formal obligations ☐

Reporting requirement, for information only ☐

Reporting requirement, and report must be approved ☐

Fully accountable to government ☐

53. What are the formal obligations (in law or in statue) of the agency vis-à-vis the Parliament?

No formal obligations ☐

Reporting requirement, for information only ☐

Reporting requirement, and report must be approved ☐

Fully accountable to Parliament ☐

54. Can the regulator's decisions be appealed?

Yes ☐ No ☐

55. By whom appeals are considered? Please, identify the court/tribunal.

General law courts ☐

Specifically designated court ☐

Ministry/government ☐

Special administrative tribunal ☐

Combination of above ☐

Other (please, explain) ☐

56. On which grounds are decisions appealable?

Errors of fact ☐

Errors of law ☐

Appeals are permitted on the merits of the decision, fully re-examining it ☐

57. Does the agency have mechanisms for internal auditing and control?

Yes ☐

Please, briefly describe its functioning

No ☐

58. How would you evaluate the independence of the auditor?

Very low ☐

Low ☐

High ☐

Very High ☐

C. TRANSPARENCY:

59. Does the agency publish the basic data for the conduct of regulatory policy (e.g. the calculation of price caps)

Yes ☐ No ☐

60. How are the agency's procedures for the elaboration of rules and the due process regulated?

The agency has its own procedures ☐

The agency is subject to the central administration's procedures ☐

There are no procedures for the elaboration of rules ☐

61. Does the legislation establish the participation of stakeholders in the agency's rule-making process?

Yes ☐ No ☐

62. If it does, do stakeholders get actually involved in the agency's rule-making process?

Yes ☐ No ☐

63. Does the agency perform public consultations?

Yes ☐ No ☐

64. How are public consultations regulated?

Informally ☐

Formally ☐

Please, specify which legal instrument regulates public consultations_____
_____
_____

65. What are the matters that have to be consulted with the stakeholders?

There are specific matters established in the legislation/agency's statue/proced. ☐

It depends on the agency's discretion ☐

Please, specify which matters are consulted with the stakeholders_____
_____

66. How frequently and how many consultations are done by the agency?

Weekly ☐

Every two weeks ☐

Monthly ☐

Semester ☐

Annually ☐

Each two years ☐

How many?_____

67. Is the agency obliged to publish its decisions?

Yes ☐ No ☐

Please, specify how are agency decisions' published_____
_____

68. Does the agency consult with advisory committees?

Yes ☐ No ☐

69. What is the nature of advisory committees?

Standing ☐ Ad hoc ☐

70. Has the agency a collective or single decision-making structure?

Collective ☐ Single ☐

71. Are there quarantine[2] rules for the Directors?

Yes ☐ No ☐

72. If so, for how long?

Time_____

D. REGULATORY, MANAGEMENT AND INSTITUTIONAL TOOLS:

73. Which regulatory instruments are available to the agency?

	Yes	No	Not applicable
By area of specialization	☐	☐	☐
Database for regulatory accounting	☐	☐	☐
Methodology for tariff revision	☐	☐	☐
Methodology for annual tariff readjustment	☐	☐	☐
Instruments for monitoring quality	☐	☐	☐
Instruments for monitoring technical standards	☐	☐	☐
Methodology for defining interconnection tariffs	☐	☐	☐
Five year revision	☐	☐	☐

74. Is benchmarking used by the agency?

Yes ☐ No ☐

75. In case the agency uses benchmarking, which is the general benchmarking method?

Rate of return regulation ☐

Price Cap Regulation ☐

Revenue Cap Regulation ☐

Sliding Scale (ROR bandwidth) ☐

[2] After the end of a director's mandate, a period of time under which the director is not allowed to work in the same area/field.

Yardstick Regulation ☐

Partial Cost Adjustment ☐

Menu of contracts ☐

Targeted Incentive Regulation ☐

A combination of them ☐

If it uses a combination, please identify the methods that are part of that combination_____
_____
_____

76. What is the regulator's discretion in selecting benchmarking method, model and inputs?

Very high ☐

High ☐

Low ☐

Very low ☐

No discretion ☐

77. How do you consider the agency's effectiveness in sanctions' enforcing?

Very high ☐

High ☐

Medium ☐

Low ☐

Very low ☐

78. Does the agency have a defined structure of posts and salaries?

Yes ☐ No ☐

79. How many employees does the agency have? Please, for each range specify number of technical and non-technical staff.

	Technical staff	Administrative staff
Fewer than 20	_____	_____
From 20 to 50	_____	_____
From 51 to 100	_____	_____
More than 100	_____	_____

80. Does the agency publish its career posts?

Newspaper ☐

Agency's web site ☐

No ☐

Other_____

81. Does the agency use performance-based payments for its employees?

Yes ☐ No ☐

If yes, please briefly describe the system_____
_____
_____
_____
_____

82. From the positions listed below, please identify the personnel whose hiring demands public examinations:

Directors[3] ☐

Managers ☐

Technical staff ☐

Administrative assistants ☐

Rest of the staff ☐

83. How do you evaluate the training agency's employees receive?

Excellent ☐

Very good ☐

Good ☐

Bad ☐

Very bad ☐

They do not receive training ☐

84. What is the agency's reporting instrument?

Annual report ☐

[3] The term Directors refers to chiefs of units/department/divisions and exclude the agency's governing authorities (Board's members/Director)

Agency governing authorities' hearings before the Parliament ☐

Both ☐

There are no reporting instruments ☐

Other_____

85. Are consumers' right and obligations legislated in regulatory or non-regulatory legal instruments?

Regulatory instruments ☐

Non-regulatory instruments ☐

There is no regulation ☐

Please, identify the legal instruments that regulate consumers' rights and obligations_____
_____

86. Does the agency evaluate the users' degree of satisfaction with the quality of the electricity service?

Yes ☐ No ☐

87. Does the agency prepare an annual report? Please, specify if that report is different from the one the agency submits to the government/parliament within its accountability obligations.

Yes ☐ No ☐

88. Does it publish it?

Yes ☐ No ☐

Please, specify where_____

89. Does the agency have a corporate/institutional strategy?

Yes ☐ No ☐

90. Does it publish it?

Yes ☐ No ☐

Please, specify where_____

91. Does the agency have a web site?

Yes ☐ No ☐

92. Are administrative files for users' claims paper or electronically-based?

Paper-based ☐

Electronically-based ☐

Users' claims are not registered ☐

Otro_____

93. Does the agency apply regulatory quality standards to its regulations? (i.e. cost-benefit analysis, alternatives to regulation, administrative simplification, regulatory impact analysis)

Yes ☐ No ☐

If yes, please identify them_____
_____
_____
_____

94. Are the Board's meetings recorded?

Yes ☐ No ☐

95. Does the agency publish its audited accounts?

Yes ☐

No ☐

The agency's accounts are not audited ☐

96. Does the agency have norms of ethics?

Yes, it has its own code/norms of ethics ☐

Yes, it applies the norms/codes of ethics of the public administration ☐

No ☐

97. Have them been used in the last five years?

Yes, it resulted in the dismissal of an agency's official ☐

Yes, it resulted in a minor punishment of an agency's official ☐

No ☐

If yes, please specify employee's position and type of sanction_____
_____
_____

APPENDIX 2: ELECTRICITY REGULATORY GOVERNANCE INDEX (ERGI)						
AUTONOMY		**TRANSPARENCY**		**ACCOUNTABILITY**		**TOOLS**
FORMAL	**INFORMAL**	**FORMAL**	**INFORMAL**	**FORMAL**	**INFORMAL**	**FORMAL**
Agency's norm creation **Q20_V**	Actual intervention **Q23_V**	Agency's proc. for rules' elab. **Q60_V**	Publication of basic data **Q59_V**	Agency's accountability **Q51_V**	Independence of internal auditing **Q58_V**	Public consultations **Q63_V**
Legal status **Q21_V**	Instructions to the agency **Q24_V**	Stakeholders' participation (law) **Q61_V**	Actual involvement of stakeholders **Q62_V**	Agency' decisions "appealability" **Q54_V**	Agency's reporting instrument **Q84_V**	Benchmarking **Q74_V**
Agency's intervention **Q22_V**	Changes in agency's resp. **Q29_V**	Ob. of publish regulatory decisions **Q67_V**	The agency perform pub. consultations **Q63_V**	Mechanisms for internal auditing **Q57_V**	Obligations with the government **Q52_V**	Regulatory instruments **Q73_V**
Regulation of the sector **Q25_V**	Interference by the Minister **Q32_V**	Collective or single decision-making **Q70_V**	Consultations with advisory committees **Q68_V**	By whom are appeals considered **Q55_V**	Obligations with the Parliament **Q53_V**	Performance-based payments **Q81_V**
Separation of roles **Q26_V**	Directors not completed their terms **Q39_V**	Quarantine rules for directors **Q71_V**	Publication of career posts **Q80_V**			Employees' training **Q83_V**
Estab. of agency''s indep. Q28_V	Reasons directors leave **Q41_V**	Agency's reporting instrument **Q84_V**	Publication of annual report **Q88_V**			Consumers' rights regulations Q85_V
Regulatory powers **Q30_V**	Evolution of the budget **Q48_V**	Annual report **Q87_V**	Publication of institutional strategy **Q90_V**			Users' surveys **Q86_V**
Resp. on particular issues **Q31_V**	Agency's effective. in enforcement **Q77_V**	Institutional strategy **Q89_V**	Website **Q91_V**			Annual report **Q88_V_A**
Enforcement powers **Q33_V**	Clarity of agency'**s** objectives Q27_V	Norms of ethics **Q96_V**	Users' claims registration **Q92_V**			Corporate/institutional strategy **Q90_V_A**
Directors' selection **Q34_V**	Budget's percentages **Q46_V_P**	Agency's audit of its accounts **Q95A_V**	Board's meetings records **Q94_V**			Website **Q91_V**
Req. to be director **Q36_V**		Public exam. for employees **Q82_V**	Publication of audited accounts **Q95B_V**			Users' claims registration **Q92_V**
Organiz. of agency's structure **Q42_V**			Use of norms of ethics **Q97_V**			Regulatory quality standards **Q93_V**
Employment policies **Q43_V**			Means of agency's decisions pub. **Q67_DES_V**			Structure of posts and salaries **Q78_V**
Compet. in anti-trust matters **Q49_V**						
Appeals authorities **Q55_V**						
Agency's decisions on personnel **Q45_V**						
Financial autonomy **Q47_V**						
Budget's sources **Q46_V**						
Renew. Direct. **Q38_V**						

APPENDIX 3 (cont.): Aggregated Electricity Regulatory Governance Indexes						
AUTONOMY			TRANSPARENCY		TOOLS	
POLITICAL AUTONOMY INDEX	**MANAGERIAL AUTONOMY INDEX**	**REGULATORY AUTONOMY INDEX**	**SOCIAL TRANSPARENCY INDEX**	**INSTITUTIONAL TRANSPARENCY INDEX**	**REGULATORY TOOLS INDEX**	**INSTITUTIONAL TOOLS INDEX**
Instructions to the agency **Q24_V**	Organiz. of agency's structure **Q42_V**	Regulation of the sector **Q25_V**	Stakeholders' participation (law) **Q62_V_A**	Agency's proc. for rules' elab. **Q60_V**	Benchmarking **Q74_V**	Performance-based payments **Q81_V**
Legal status **Q21_V**	Employment policies **Q43_V**	Regulatory powers **Q30_V**	Agency's publication of its decisions **Q67_DES_V**	Agency's publication of its decisions **Q67_DES_V**	Regulatory instruments **Q73_V**	Employees' training **Q83_V**
Agency's intervention **Q23_V_A**	Agency's decisions on personnel **Q45_V**	Resp. on particular issues **Q31_V**	Publication of basic data **Q59_V**	Collective or single decision-making **Q70_V**	Consumers' rights regulations **Q85_V**	Publication of annual report **Q88_V_A**
Separation of roles **Q26_V**	Financial autonomy **Q47_V**	Enforcement powers **Q33_V**	The agency perform pub. consultations **Q63_V**	Quarantine rules for directors **Q71_V**		Publication of institutional strategy **Q90_V_A**
Interference by the Minister **Q32_V**	Structure of posts and salaries **Q78_V**		Consultations with advisory committees **Q68_V**	Agency's reporting instrument **Q84_V**		Structure of posts and salaries **Q78_V**
Directors' selection **Q34_V**	Performance-based payments **Q81_V**		Website **Q91_V**	Publication of institutional strategy **Q90_V_A**		Website **Q91_V**
Renewability of directors' mandate **Q38_V**			Users' claims registration **Q92_V**	Public exam. for employees **Q82_V**		Users' claims registration **Q92_V**
Directors not completed their terms **Q39_V**				Publication of agency's audit accounts **Q95_V_A**		Regulatory quality standards **Q93_V**
Reasons directors leave **Q41_V**				Publication of career posts **Q80_V**		Public consultations **Q63_V**
Budget's percentages **Q46_V_P**				Board's meetings records **Q94_V**		
				Publication of annual report **Q88_V_A**		
				Norms of ethics **Q96_V**		

APPENDIX 4: Countries' scores in the ERGI and its components

COUNTRY	ERGI	FORMAL AUTONOMY	INFORMAL AUTONOMY	FORMAL TRANSPAR.	INFORMAL TRANSPAR.	FORMAL ACCOUNTAB.	INFORMAL ACCOUNTAB.	TOOLS
T. AND TOBAGO	0.8885317	0.807	0.850	1.00	0.850	1.000	0.950	0.762
BRAZIL	0.8558441	0.894	0.856	0.8911	0.692	1.000	0.750	0.908
BOLIVIA	0.8438842	0.904	0.920	0.700	0.909	1.000	0.687	0.786
PERU	0.8365146	0.939	0.830	0.864	0.854	1.000	0.500	0.869
EL SALVADOR	0.8242612	0.896	0.800	0.950	0.783	1.000	0.625	0.715
GUATEMALA	0.7932901	0.761	0.856	0.500	0.750	0.875	0.875	0.936
ARGENTINA	0.7790295	0.831	0.870	0.727	0.705	0.875	0.562	0.883
BARBADOS	0.7623256	0.835	0.812	0.750	0.682	1.000	0.667	0.590
COLOMBIA	0.7553371	0.695	0.660	0.909	0.715	1.000	0.592	0.716
R. DOMINICANA	0.7504634	0.936	0.870	0.636	0.800	0.812	0.687	0.511
NICARAGUA	0.74808	0.920	0.900	0.778	0.554	0.937	0.512	0.635
COSTA RICA	0.7446433	0.811	0.870	0.864	0.633	0.937	0.500	0.597
URUGUAY	0.7256921	0.672	0.930	0.755	0.646	0.687	0.667	0.723
MEXICO	0.7234332	0.767	0.750	0.955	0.717	1.00	0.500	0.376
JAMAICA	0.7221702	0.812	0.750	0.727	0.654	0.750	0.500	0.862
PANAMA	0.6332391	0.862	0.770	0.650	0.542	0.875	0.187	0.546
ECUADOR	0.6069103	0.829	0.540	0.636	0.521	0.875	0.437	0.409
CHILE	0.5610201	0.509	0.630	0.623	0.641	0.750	0.250	0.525
HONDURAS	0.5600794	0.662	0.722	0.500	0.575	0.750	0.333	0.377

APPENDIX 5: Countries' scores in the different components of autonomy, transparency, accountability and tools

COUNTRY	POLITICAL AUTONOMY	MANAGERIAL AUTONOMY	REGULATORY AUTONOMY	SOCIAL TRANSPARENCY	INSTITUTIONAL TRANSPARENCY	REGULATORY TOOLS	INSTITUTIONAL TOOLS
T. AND TOBAGO	0.670	0.833	0.800	0.917	0.864	0.950	0.663
BRAZIL	0.967	0.917	0.900	0.714	0.817	1.000	0.867
BOLIVIA	0.920	0.750	0.863	0.857	0.791	0.807	0.756
PERU	0.900	0.833	0.850	0.857	0.917	1.000	0.811
EL SALVADOR	0.830	0.750	0.950	0.857	0.750	1.000	0.589
GUATEMALA	0.667	0.917	0.925	0.786	0.563	1.000	0.900
ARGENTINA	0.770	0.917	0.925	0.833	0.614	0.950	0.844
BARBADOS	0.611	0.800	0.925	0.667	0.646	0.807	0.472
COLOMBIA	0.535	0.375	0.775	0.914	0.733	0.857	0.638
R. DOMINICANA	0.950	0.750	0.900	0.857	0.583	0.713	0.500
NICARAGUA	0.950	0.750	0.975	0.750	0.475	0.667	0.583
COSTA RICA	0.850	0.750	0.775	0.679	0.625	0.903	0.561
URUGUAY	0.700	0.583	0.713	0.786	0.608	0.950	0.728
MEXICO	0.700	0.583	0.575	0.750	0.771	0.213	0.472
JAMAICA	0.650	1.000	0.700	0.571	0.688	0.903	0.833
PANAMA	0.689	0.750	1.000	0.786	0.409	0.783	0.417
ECUADOR	0.600	0.750	0.775	0.750	0.292	0.523	0.417
CHILE	0.400	0.417	0.750	0.543	0.667	0.523	0.472
HONDURAS	0.650	0.500	0.650	0.679	0.375	0.760	0.281

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