Political Institutions and Electric Utility Investment:

A Cross-Nation Analysis

Mario E. Bergara
Witold J. Henisz
Pablo T. Spiller

While cross-border investment flows are surging to levels not witnessed since before the Great Depression, the evaluation of political risk inherent in these projects has changed little since the 1960s. Since 1983, foreign direct investment inflows to developing countries have increased five-fold. From 1989 to 1992, the stock of American affiliates infrastructure assets grew by 153%, leading to the share of total assets invested in infrastructure doubling from 1.6% to 3.0%. While this is but a fraction of the peak of 22% reached in 1940, recent research by the World Bank suggests that more than $2.0 trillion of new infrastructure will be required in East Asia and Latin America alone during the next ten years.[1] As developing countries have increasingly reopened their doors to foreign capital for such projects, multinational corporations need to carefully weigh the potential costs and benefits of reentering markets in which previous waves of investments were expropriated.

Political risk analysis attempts to unpack the complex relationship between social and political institutions and economic outcomes. The institutional environment consists of the formal and informal rules of the game that determine the incentives for individual behavior. Thus, the institutional environment provides the structure for exchange that, together with the technology employed, determines the cost of doing business. Institutional environments

Partial funding from the University of California Center for International Economics, the University of California Energy Institute, the California Management Review, and from the cooperative agreement between the Institute for Policy Reform (IPR) and the Agency for International Development (USAID), Cooperative Agreement No. PDC#0095-A-00—1126-00, is gratefully acknowledged. Views expressed in this article are those of the authors and not necessarily those of IPR or USAID.

that fail to offer credible commitments against arbitrary changes in the rules of the game, including expropriation, raise transaction costs throughout the economy. Transaction costs also vary within an institutional environment according to the politicization of the transaction and the returns to the firm from using the asset in its next best use.

This article analyzes the interaction of the institutional endowment of a country and investment in an industry with extremely high politicization and sunk costs: electric utilities. It links quantifiable differences in institutional environments across a wide sample of nations to investment decisions in their respective utility sectors. Nations need to provide credible commitments against arbitrary decision making by the state that may impact on the profitability of firms' investments. The existence of a number of independent constraints on executive behavior creates a better environment for utility investment. Managers considering investing in infrastructure projects should therefore evaluate the investment proposal not only on its explicit terms, but also on the likelihood that the government will honor them.

Institutions and the Performance of Electric Utilities

Institutions are the formal and informal rules that constrain individual behavior and shape human interaction.[2] They are humanly devised constraints that structure political, economic and social relationships. Throughout history, institutions have been devised to create order and reduce uncertainty in trade.[3] Together with the standard constraints of economics, they define the choice set and therefore determine transaction and production costs, and hence the profitability and feasibility of engaging in economic activity. In particular, complex forms of economic organization or transactions involving high politicization and/or sunk costs will be increasingly disadvantaged as the institutional environment degrades.

Three features of the electric utility industry combine to create complex contracting problems of an inherently political nature. First, the technology involves large specific, sunk investments; second, it is characterized by important economies of scale and scope; and third, outputs are massively consumed. These features have traditionally raised the need for governmental regulation of utilities.[4] Since a large component of infrastructure investment is sunk,[5] once the investment is undertaken the operator will be willing to continue operating as long as operating revenues exceed operating costs. Since operating costs do not include a return on sunk investments (but only on the alternative value of these assets), the operating company will be willing to operate even if prices are below total average costs. Economies of scale imply that in most infrastructure services, there will be few suppliers in each locality. Finally, the fact that infrastructure services tend to be massively consumed implies that politicians and interest groups will care about the level of infrastructure pricing. Thus, massive consumption, economies of scale, and sunk investments provide governments

(either national or local) with the incentive to behave opportunistically vis-à-vis the investing company.[6]

For example, after the investment is sunk, the government may try to restrict the operating company's pricing flexibility; may require the company to undertake special investments, purchasing, or employment patterns; or may try to restrict the movement of capital. All these are attempts to expropriate the company's specific investments by administrative measures. Thus, expropriation may be indirect and undertaken by subtle means. While the government may uphold and protect traditionally conceived property rights, it may still attempt to expropriate through regulatory procedures.

Sunk assets' expropriation may be profitable for a government if the direct costs (such as reputation loss vis-à-vis other utilities or lack of future investments by utilities) are small compared to the short-term benefits of such action (such as achieving re-election by reducing utilities' prices or by attacking the monopoly), and if the indirect institutional costs (that is, disregard of the judiciary or not following the proper administrative procedures) are not too large.[7] Thus, incentives for expropriation of sunk assets should be expected to be largest in countries where there are no formal or informal governmental procedures required for regulatory decision making; where regulatory policy is centralized in the administration; where the judiciary does not have the tradition or the power to review administrative decisions; and where the government's horizon is relatively short.[8]

Private investors (as well as public company managers) knowing that under some circumstances, governments may not be able to refrain from reneging on explicit or implicit agreements (i.e., behave opportunistically), will undertake actions to protect their investments. In particular, to protect their assets, investors will invest in less specific assets. Thus, less efficient, but more flexible technologies may be chosen, limiting the social value of the enterprise.[9] Alternatively, firms may alter the organizational form of their international operations so as to create safeguards against opportunistic behavior by other private parties or by the governmnent.[10] In an extreme case, private investment will not take place at all, and public ownership may become the default mode of organization.

Cross-Nation Analysis

Most of the empirical work on the relationship among political institutions, regulatory commitment, and utility economic performance consists of case studies. These are generally focused on the telecommunications sector,[11] and deal with how governments differ in their perceptions of and their abilities to communicate credible commitments.[12] The purpose here, though, is to empirically implement the framework developed above by exploiting the differences across nations in their institutional environments and linking them to their respective utilities investment decisions. This cross-nation analysis sheds light on

the impact of political institutions and the ability of governments to commit to stable and non-opportunistic regulatory policies on utility sector performance.

Measuring the Institutional Environment

Levy and Spiller have developed a framework to analyze the interaction of the institutional endowment of a country, the nature of its regulatory institutions, and the performance of the sector.[13] They emphasize that the credibility and effectiveness of a regulatory framework (and hence its ability to facilitate private investment) vary with a country's political and social institutions. They also note that performance can be satisfactory with a wide range of regulatory procedures as soon as three complementary mechanisms restraining arbitrary administrative action are all in place:

- substantive restraints on the discretion of the regulator,
- formal or informal constraints on changing the regulatory system, and
- institutions that enforce the above formal (substantive and procedural) constraints.[14]

The basic political institutions of a country refers to the nature of its judiciary and of its legislative and executive institutions.[15] In particular, an independent and professional judiciary is a natural candidate for satisfying the condition of enforcing formal constraints. A politically corrupt judiciary will be unlikely to side against the government on sensitive matters. Thus, judicial independence and professionalism imply a more confident framework for enforcing contracts.[16]

Countries can also be divided between those with unified and those with divided governments. In unified governments, the party in power also controls the legislative process. Parliamentary systems with electoral rules that systematically bring a majority party to government are considered unified. Similarly, those Presidential systems that align presidential elections with legislative elections, and that are developed so as to provide the President with a working majority in the legislature, are also taken as unified.[17] Divided governments, on the other hand, are parliamentary systems that systematically need to form governments by coalition, as electoral rules are such that party proliferation preempts a single party from achieving a majority in the legislature. Similarly, Presidential systems with electoral rules that systematically elect Presidents without a tight control of the legislature are categorized as divided governments.

Other indicators of divided governments include the degree of federalism,[18] the number of legislative chambers elected under independent electoral rules, the degree of development of political parties, and the length of experience with stable democratic elections. Each of these measures increases the need for consultation and agreement among institutionally independent entities before status quo policies may be changed. In pure unified governments, rules designed by a government can be changed unilaterally by the next government. In divided governments, on the other hand, changes in government may not provide the new government the ability to reverse prior regulatory policies.

Thus, the credibility of a regulatory policy is stronger in divided than in unified systems. Managers of utilities can therefore forecast more confidently and are more likely to base their economic decisions on non-political considerations. Sector performance is therefore expected to be stronger in divided than in unified governments.

Levy and Spiller further emphasize the role of the contending social interests within a society and the balance between them.[19] In particular, the more contentious these social interests are, the higher the potential for a reversing of government policies. The higher the political instability of a country, the higher the potential for opportunistic behavior by governments, and hence the more inefficient will the performance of the sector be.[20]

Finally, Levy and Spiller stress the importance of administrative capabilities.[21] In principle, the higher the administrative capabilities of the nation, the higher the potential sophistication of the regulatory regime, and hence the higher the performance of the sector.

The Data

In order to implement the analysis, data on electric utility investment and information for each country concerning its basic political institutions was needed. Besides, other variables helping to control for some structural features of the sector were also useful. (See Appendix I for a detailed description of the database.)

The dependent variable in the analysis is the per capita electrical generating capacity of a given country. This proxy for the stock of utility investment is presumed to be influenced by the political institutions and economic characteristics of that country.

The primary independent variable is an index of political credibility derived from three component variables: judicial effectiveness, formal constraints on executive discretion, and informal constraints on executive discretion. The efficiency and integrity of the legal environment determines the ability of business to rely on an impartial and timely third-party dispute resolution mechanism in the case of a dispute with the government. Where courts are corrupt or politically compromised, businesses must devise alternative safeguards to government expropriation of returns such as the use of highly mobile assets,[22] foreign political risk loan guarantees from OPIC or the World Bank, or explicit/implicit profit-sharing agreements with government officials. Each of these measures raises the costs of doing business relative to operating in an environment in which neoclassical contract law operates effectively. The degree of independence and strength of the court system and the judicial institutions is captured by the law and order and legal systems indicators. A more objective measure of judicial independence is also derived from a survival analysis of the tenure of justices on the Supreme Court. Supreme Courts whose justices have average tenures lower than those of political leaders are unlikely to

rule against the current government in a sensitive dispute. Median tenure of supreme or high court justices may thus be used as a proxy measure for judicial independence.

Formal constraints on executive power consists of Constitutional checks and balances or veto points within and between the executive and legislative branches. The existence of federal units or a bicameral legislature elected under independent voting rules increases the number of independent parties from whom the executive must seek approval before implementing changes in status quo policies. Similarly, the existence of an effective legislature (one that offers a legitimate counterweight to executive power)—especially one that has constitutional parity with the executive—decreases the likelihood of policy change. The explicit or implicit unification of state, military, and religious power increases the range of discretion of the government as it reduces the likelihood of organized opposition to state policies. By contrast, the strong development of political parties that transcend individual personalities and policies can enhance the potential for such opposition and serve as a check on government discretion.

The institutional strength and quality of the bureaucracy is another shock absorber that tends to minimize revisions of policy when governments change. This is what the bureaucracy quality index measures. Countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services offer better political environments for investors. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruiting and training. Countries that lack the cushioning effect of a strong bureaucracy offer inferior political environments because a change in government tends to be traumatic in terms of policy formulation and day-to-day administrative functions.

Government corruption is also a threat to private investment for several reasons: it distorts economic and financial investment, it reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and it introduces instability into the political process. For their corruption indicator, the International Country Risk Guide staff look at regime type, at how long a government has been in power continuously, and at the experience of foreign investors. In the case of a one-party state or non-elected government, corruption in the form of patronage and nepotism is presumed. In the case of a democratic government, things tend to go wrong after an elected government has been in office for more than two consecutive terms. On that basis, democratic countries whose governments have been in office for less than five years, and where government officials do not often seek special payments, are awarded the highest ratings. An intermediate rating indicates a country whose government has been in office for more than ten years, where a large number of officials are appointed rather than elected, and bribery demands are fairly frequent. The lowest ratings are given to countries that are usually non-democratic, where the government has been in power for more

than ten years, high government officials are likely to demand special payments, and illegal payments are generally accepted throughout the society. Finally, the existence of severe racial or national tensions introduces an additional level of required compromise in political decisions as the benefits and costs to various racial, ethnic, or religious groups must be carefully weighed to avoid exacerbating existing conditions.

Information on all political variables except judicial tenure was available for 87 of the 91 countries in our sample. Judicial tenure was available for only 38 countries. It must be noted that some political variables are highly correlated. Appendix Table 1 shows the correlation matrix among the eleven political indexes available for the countries under scrutiny. In order to avoid severe multicollinearity problems arising from this correlation among political variables, two political indexes (POL and POL2) were defined as the weighted sum of the corresponding variables from each category for each country.[23] (See Appendix 2 for values of the composite variables for each country.)

Non-political control variables were also included in the analysis. In particular, an increase in population, income, and percentage of urbanization should induce higher investment by utilities. A larger proportion of industrial customers (reflected by a larger fraction of the gross domestic product corresponding to industrial production) implies a higher potential for co-generation and a more even demand for electricity. Thus, holding personal income constant, there would be a reduction in the need for generation capacity. Energy sources will also influence utilities investment. Hydroelectric plants require high initial capital costs relative to operating cost, which will be reflected on higher investment. Finally, more stable and less risky political environments should lead to stronger incentives to invest in this sector. (Summary statistics for all variables used in the analysis are presented in Appendix 3.)

Results

The main results are shown in Table 1. Well-defined and credible political institutions are positively and significantly correlated with national electricity generating capacity (taken here as proxy of investment decisions). If a country at the average level of political constraints, such as Thailand or Ecuador, were to improve their level of commitment by one standard deviation to arrive at the level of political constraints currently held by Portugal or the United Kingdom, all else equal, their generating capacity would increase by 1.2 MW per 1000 population (40% of one standard deviation), implying an elasticity at mean values of 49%. Of the non-political control variables, both income and percent of generating capacity from hydroelectric power are also positively and significantly correlated with generating capacity.

One important question is the extent to which these results are particular to the measure of the institutional environment derived in this article. Alternative measures used in other recent publications were also examined for their predictive power. The regression using the index of five political risk variables

TABLE 1. Dependent Variable: Log of Total Generating Capacity in Megawatts per Thousand Population (LCAPPC)

N	87	87	87	86	86
CONSTANT	−1.04 (−5.06)	−1.08 (−5.38)	−0.94 (−3.82)	−0.90 (−3.48)	−0.69 (−2.09)
LGDPPC	0.17 (5.48)	0.16 (4.93)	0.27 (10.30)	0.27 (9.69)	0.26 (9.08)
LIND	−0.11 (−1.65)	−0.15 (−2.20)	−0.16 (−1.99)	−0.16 (−1.99)	−0.15 (−1.97)
LURBAN	−0.01 (−0.26)	0.05 (0.64)	−0.08 (−0.94)	−0.07 (−0.87)	−0.08 (−0.98)
LHYDRO	0.04 (2.65)	0.05 (2.84)	0.03 (1.80)	0.03 (1.78)	0.03 (1.67)
POL	0.30 (4.92)				
ICRG5		0.17 (5.33)			
EXECCON			0.02 (1.29)		
DEMOCR				0.01 (1.20)	
GASTIL					−0.03 (−1.56)
R^2 (adjusted) F-stat.	0.82 79.94	0.83 83.71	0.77 59.28	0.77 59.08	0.77 59.28

Note: The methodology followed is that of ordinary least squares. Values in parentheses are t-statistics.

(ICRG5) from *The International Country Risk Guide*[24] is reported in column 2 and provides very similar results to those in column 1, although its explanatory power is slightly better than that of column 1. Columns 3, 4, and 5 report the results using the measure of formal constraints on executive discretion (EXECCON) and democracy (DEMOCR) from the Polity III database as well as the GASTIL[25] index of political and civil rights. These measures, which are less closely tied to the notion of credible commitment, perform less effectively in predicting cross-nation variation in generating capacity (note that the GASTIL index is lower for countries with more rights, explaining the inversion in sign).

Table 2 presents a similar set of analysis for the 38 country sample for which data is available on judicial tenure.[26] These results suggest that judicial independence should be considered alongside other formal and informal constraints on executive discretion in the determination of the risk in investing in the infrastructure of developing countries. Indeed, a comparison of columns 1 and 2 suggests that judicial tenure tells most of the story told by the other political variables. In column 3 we find that a country at the median level of our

TABLE 2. Dependent Variable: Log of Total Generating Capacity in Megawatts per Thousand Population (LCAPPC)

N	38	38	38
CONSTANT	−1.61 (−3.42)	−1.48 (−3.09)	−1.46 (−3.18)
LGDPPC	0.27 (5.25)	0.21 (3.13)	0.21 (3.40)
LIND	−0.05 (−0.35)	−0.07 (−0.43)	−0.07 (−0.44)
LURBAN	−0.11 (−0.77)	−0.09 (−0.62)	−0.09 (−0.64)
LHYDRO	0.12 (3.24)	0.12 (3.32)	0.12 (3.37)
JUDEN	0.59 (2.94)	0.52 (2.55)	
POL		0.15 (1.18)	
POL2			0.33 (3.23)
R^2 (adjusted) F-stat.	0.82 36.64	0.83 31.15	0.83 38.51

Note: The methodology followed is that of ordinary least squares. Values in parentheses are t-statistics.

modified constraint measure, such as Jamaica or Botswana, that increased its level of constraints on executive discretion by one standard deviation to the level of Malaysia or Ireland would be expected to increase its generating capacity by 1.24 MW per 1000 population (47% of a standard deviation), implying again a 49% elasticity at the mean.

Implications and Concluding Remarks

This analysis has important implications for firms considering investment in the infrastructure of developing countries as well as policymakers seeking to attract foreign investment to such investments. The credibility and effectiveness of a regulatory system (and hence its ability to facilitate private investment) vary with a country's political and social institutions. Increasing the number of independent checks on executive power, especially through an independent judicial system, improves the framework for utility investment. Utility performance can be satisfactory as soon as there are substantive restraints on the discretion of the regulator, formal or informal constraints on changing the regulatory system, and institutions that enforce the formal (substantive and procedural) constraints.

Firms choosing between alternative international investment opportunities should carefully weigh the extent to which such constraints restrict policy changes by the government in the present and in the future. The greater the number of independent veto points against policy changes, the greater the likelihood that initial contracts will be honored. An independent and respected judiciary with a track record of successfully ruling against the government is an important prerequisite to a government's ability to credibly commit to contract terms. Firms should therefore examine the tenure length of justices at the relevant court, as well as their employment histories and prospects, to determine the likelihood that they will be given a fair hearing in the event of contractual disputes. Should the executive change hands, the existence of one (or two) inde-

pendent and effective legislatures, federalist institutions, and a professional and competent administrative apparatus can insure policy stability even in the face of regime change.

Policymakers in developing countries seeking to attract foreign investors to large sunk and politically sensitive sectors should recognize that contractual terms, tax incentives, and subsidies only function to the extent that they are credible. In the absence of substantive constraints on the government reneging on contract terms, investment will remain offshore. At the extreme, the public sector itself will have to fund operations that could more efficiently and profitably be managed by private firms. Improvements in the political and legal environment (and thus, in the regulatory commitment and the country's credibility) should therefore be a relevant ingredient in the analysis of both policymakers and investors seeking to expand private sector involvement in infrastructure projects in developing countries.

APPENDIX
Variables Used in Econometric Analysis

The variables used in this econometric analysis were taken from different sources, including World Bank and OECD tables on the electricity sector, world resources, structural features of the countries, and the like; the political data compiled by Keith Jaggers and Ted Gurr in the Polity Dataset;[27] tables of the International Country Risk Guide; and published sources such as Gorvin[28] and Derbyshire and Derbyshire.[29]

The endogenous variable is defined in the following way:

LCAPPC log of the sum of public and private electricity generating capacity per thousand population

The non-political variables used as explanatory variables are:

LGDPPC log of the country's GDP per capita;

LIND log of the proportion of industry product in total GDP;

LURBAN log of country's urbanization percentage;

LHYDRO log of the proportion of electricity generated using hydro sources;

The political variables[30] taken into consideration are the following (unless otherwise noted, higher score imply improvements in the institutional environment's ability to credibly commit):

Judicial Independence

JUDTEN tenure of justices on the high or supreme court as a percentage of the United States (from Henisz);

LAW index of law and order tradition including sound political institutions, a strong court system and provisions for an orderly succession of power (from International Country Risk Guide);[31]

Formal Constraints on Executive Discretion

FED dummy variable for federalist states (from Derbyshire and Derbyshire);

DUAL dummy variable for dual executives—parity of executive and legislature (from Polity supplemented by Derbyshire and Derbyshire);

BICA dummy variable for bicameral legislatures (from Polity and Derbyshire and Derbyshire);

LEGEFF index of legislature's effectiveness (from Polity and Derbyshire and Derbyshire);

MILIT index of participation in government by military (from ICRG);

REL index of participation in government by organized religion (from ICRG);

PART Degree of development of political parties (from Polity);

Informal Constraints on Executive Discretion

BUREAU index of quality of the bureaucracy (from ICRG);

CORRUP index of corruption in government (from ICRG);

TENS index of prevalence of racial/nationalist tensions (from ICRG).

Robustness was examined by testing alternative specifications of the institutional environment including the following measures:

ICRG5 sum of five ICRG variables including **LAW**, **BUREAU**, and **CORRUP** (defined above) and:

- **REPUD** index of likelihood of modification of contracts with foreign businesses;
- **EXPROP** index of likelihood of outright confiscation and forced nationalization;

EXECCON index of the extent of institutionalized constraints on the decision-making powers of chief executives imposed by any "accountability groups" including legislatures, councils, advisors, military, or a strong independent judiciary (from Polity);

DEMOCR index of institutionalized democracy composed by examining three interdependent elements: the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders; existence of institutionalized constraints on the exercise of executive power; and guarantee of civil liberties to all citizens (from Polity); and

GASTIL sum of Gastil indexes of political and civil liberties which measure freedom and fairness of elections, including the existence of competitive parties and an independent opposition, and individual freedoms and opportunities of the individual respectively. Note that, unlike all previous indexes, a higher score represents a diminution in the institutional environment.

APPENDIX TABLE 1. Correlation Matrix for Political Variables

	LAW	FED	DUAL	BICAM	PART	LEGEFF
LAW	1.00					
FED	0.35	1.00				
DUAL	0.16	–0.02	1.00			
BICAM	0.22	0.41	0.10	1.00		
PART	0.72	0.28	0.19	0.35	1.00	
LEGEFF	0.57	0.30	0.24	0.67	0.78	1.00
MILIT	0.70	0.38	0.13	0.42	0.66	0.65
REL	0.41	0.06	0.15	0.43	0.38	
BUREAU	0.81	0.28	0.24	0.39	0.68	0.61
CORRUP	0.82	0.25	0.15	0.24	0.65	0.58
TENS	0.48	–0.06	0.03	0.11	0.49	0.33

	MILIT	REL	BUREAU	CORRUP	TENS
MILIT	1.00				
REL	0.47	1.00			
BUREAU	0.74	0.35	1.00		
CORRUP	0.71	0.45	0.79	1.00	
TENS	0.32	0.48	0.41	0.48	1.00

APPENDIX TABLE 2. Composite Political Variable Scores in 1987

COUNTRY	POL	POL2	COUNTRY	POL	POL2	COUNTRY	POL	POL2
Algeria	1.24		Greece	1.79		Papau N.G.	1.91	
Argentina	1.79		Guatemala	0.86	0.57	Paraguay	1.13	0.65
Australia	2.75	2.54	Guinea	1.18		Peru	1.01	0.83
Austria	2.62		Guinea Bissau	0.96		Philippines	1.00	0.89
Bangladesh	0.62	0.95	Honduras	1.21	0.82	Poland	1.60	
Belgium	2.61	2.36	Hungary	2.01		Portugal	2.24	
Bolivia	0.97		India	1.42	1.14	Senegal	1.28	
Botswana	2.09	1.46	Indonesia	0.77		Sierra Leone	1.43	
Brazil	2.13	1.63	Ireland	2.13	2.24	Somalia	1.48	
Burkina Faso	1.40		Japan	2.54		Spain	1.99	
Cameroon	1.36	0.94	Jordan	1.26		Sri Lanka	1.27	1.10
Canada	2.78	2.52	Kenya	1.67	1.19	Sudan	0.93	1.01
Chile	1.51	1.21	Korea	1.43		Sweden	2.69	
China	1.51		Luxembourg	2.63		Switzerland	2.86	
Colombia	1.45	0.88	Madagascar	1.66		Syria	1.11	
Congo	1.24		Malawi	1.31	1.02	Tanzania	1.43	
Costa Rica	2.11		Malaysia	1.95	2.15	Thailand	1.61	
Cote D'Ivoire	1.72		Mali	0.92		Togo	1.13	
Denmark	2.69		Mexico	1.81	1.16	Uganda	0.63	
Dominican R.	1.58	1.07	Morocco	1.37		U.K.	2.32	1.67
Ecuador	1.71	1.00	Mozambique	1.52		U.S.A.	2.87	2.94
Egypt	1.25		Netherlands	2.74	2.33	Uruguay	1.78	
El Salvador	1.05		New Zealand	2.63	2.53	Venezuela	2.09	
Ethiopia	1.15		Nicaragua	1.34	1.23	Yemen, A.R.	0.98	
Finland	2.83		Noiger	1.62		Yugoslavia	1.31	
France	2.52	1.78	Nigeria	0.74	1.17	Zambia	1.15	1.02
Gabon	1.37		Norway	2.63	2.60	Zimbabwe	1.35	1.04
Germany	2.58	2.26	Pakistan	1.09	0.90			
Ghana	0.90	0.89	Panama	1.16				

APPENDIX TABLE 3. Summary Statistics for Variables Included in Regressions

N = 87	lcappc	lpop	lgdppc	lind	lurban	lhydro	pol
Mean	0.39	9.53	7.24	3.37	3.83	3.23	1.65
Median	0.18	9.30	7.03	3.43	3.91	3.71	1.49
Max	1.96	13.88	10.17	3.97	4.58	4.61	2.87
Min	0.01	5.92	4.38	2.20	2.56	0.00	0.62
St. Dev.	0.45	1.41	1.58	0.38	0.50	1.31	0.61

N = 87	icrg5	execcon	democr	gastil
Mean	2.92	4.38	4.77	3.68
Median	2.67	4.00	5.00	3.75
Max	5.00	7.00	10.00	7.00
Min	1.03	1.00	0.00	1.00
St. Dev.	1.11	2.41	4.44	2.00

N = 38	lcappc	lpop	lgdppc	lind	lurban	lhydro	pol
Mean	0.44	9.89	7.40	3.43	3.94	3.54	1.69
Median	0.23	9.71	7.07	3.45	4.07	3.84	1.55
Max	1.96	13.59	9.91	3.87	4.58	4.61	2.87
Min	0.02	7.78	4.96	2.83	2.56	0.01	0.62
St. Dev.	0.49	1.34	1.55	0.27	0.50	0.97	

N = 38	icrg5	execcon	democr	gastil	judten	pol2
Mean	2.95	4.95	5.82	3.13	0.40	1.46
Median	2.55	6.00	7.50	2.65	0.31	1.18
Max	5.00	7.00	10.00	6.50	1.00	2.94
Min	1.03	1.00	0.00	1.00	0.06	0.57
St. Dev.	1.21	2.32	4.12	1.64	0.25	0.65

APPENDIX TABLE 4. Dependent Variable: Log of Total Generating Capacity in Megawatts per Thousand Population (LCAPPC)

N	39	39	39	39	38
CONSTANT	−1.36 (−2.64)	−1.45 (−2.86)	−1.51 (−2.79)	−1.42 (−2.54)	−1.28 (−1.88)
LGDPPC	0.27 (3.78)	0.27 (3.90)	0.36 (8.12)	0.36 (7.76)	0.36 (7.01)
LIND	−0.01 (−0.05)	0.02 (0.11)	0.02 (0.10)	0.00 (0.01)	0.02 (0.10)
LURBAN	−0.24 (−1.66)	0.22 (1.51)	−0.30 (−2.11)	−0.31 (−2.13)	−0.32 (−2.24)
LHYDRO	0.11 (2.68)	0.10 (2.47)	0.10 (2.40)	0.10 (2.43)	0.10 (2.31)
POL	0.23 (1.77)				
ICRG5		0.12 (1.75)			
EXECCON			0.01 (0.29)		
DEMOCR				0.00 (0.67)	
GASTIL					−0.02 (−0.67)
R^2 (adjusted) F-stat.	0.80 30.90	0.80 30.84	0.78 27.75	0.78 28.11	0.78 27.98

Note: The methodology followed is that of ordinary least squares. Values in parentheses are t-statistics.

Notes

1. United Nations, *World Investment Report* (New York, NY: United Nations, 1996).
2. D. North, *Institutions, Institutional Change, and Economic Performance* (New York, NY: Cambridge University Press, 1990).
3. D. North, "Institutions," *Journal of Economic Perspectives*, 5/1 (1991).
4. See, among others, North (1990), op. cit.; O. Williamson, "The Logic of Economic Organization," *Journal of Law, Economics and Organization*, 4 (1988); V. Goldberg, "Regulations and Administered Contracts," *Bell Journal of Economics*, 7 (1976); Y. Barzel, Economic Analysis of Property Rights (New York, NY: Cambridge University Press, 1989); P.T. Spiller, "Institutions and Regulatory Commitment in Utilities Privatization," *Industrial and Corporate Change*, 2/3 (1993); B. Levy and P.T. Spiller, "The Institutional Foundations of Regulatory Commitment: A Comparative Analysis of Five Country Studies of Telecommunications Regulation," *Journal of Law, Economics and Organization*, 10/2 (1994)
5. Specific or sunk investments are those that, once undertaken, have productive value in alternative uses substantially below their investment cost.
6. Observe that this incentive exists vis-à-vis public and private companies.
7. P.T. Spiller, "A Positive Political Theory of Regulatory Instruments: Contracts, Administrative Law or Regulatory Specificity," *Southern California Law Review*, 69/2 (1996).
8. Salant and Woroch, Salant, and Gilbert and Newbery have observed that concerns for future gains from cooperation can outweigh the short-run temptations of opportunism. This conclusion, which draws from the literature on repeated games, rests on the premise that firms and regulatory commissions have infinite horizons. D. Salant and G. Woroch, "Trigger Price Regulation," *Rand Journal of Economics*, 23 (1992); D. Salant, "Behind the Revolving Door: A New View of Public Utility Regulation," *Rand Journal of Economics*, 26/3 (1995); R. Gilbert and D. Newbery, "Regulation Games," Center for Economic Policy Discussion Paper No. 267, University of California, Berkeley, 1988.
9. B. Zelner, "The Effects of the Institutional Environment and Organizational Capabilities on Technology Adoption in the U.S. Electric Utility Industry, 1973-1996," Dissertation manuscript, Haas School of Business, University of California, Berkeley, 1998.
10. W. Henisz, "The Institutional Environment for International Investment," Dissertation manuscript, Haas School of Business, University of California, Berkeley, 1998.
11. One exception is Vogel's analysis of environmental policies in Great Britain and the United States. He attributes political institutions an important role in explaining different "national styles of regulation." D. Vogel, *National Styles of Regulation: Environmental Policy in Great Britain and the United States* (Ithaca, NY: Cornell University Press, 1986).
12. See, for example, B. Levy and P.T. Spiller, eds., *Regulations, Institutions, and Commitment* (New York, NY: Cambridge University Press, 1996); R. Gilbert and E. Kahn, *International Comparisons of Electricity Regulation* (New York, NY: Cambridge University Press, 1996); R. Ramamurti, ed., *Privatizing Monopolies* (Baltimore, MD: Johns Hopkins University Press, 1996).
13. Levy and Spiller (1994), op. cit.
14. Issues like regulatory uncertainty, costly disputes between regulators and firms, and poor systems of arbitration are also discussed in M. Bishop, J. Kay, and C. Mayer, *The Regulatory Challenge* (New York, NY: Oxford University Press, 1995).
15. Analyses on bureaucratic discretion, congressional influence, commitment, and the interaction among politicians, interest groups and regulators can be found in

B. Weingast and M. Moran, "Bureaucratic Discretion or Congressional Control? Regulatory Policymaking by the Federal Trade Commission," *Journal of Political Economy*, 91/5 (1983); J. Ferejohn and C. Shipan, "Congressional Influence on Bureaucracy," *Journal of Law, Economics and Organization*, 6 (1990), D. Spulber and D. Besanko, "Delegation, Commitment, and the Regulatory Mandate," *Journal of Law, Economics and Organization*, 8/1 (1992); P.T. Spiller, "Politicians, Interest Groups, and Regulators: A Multiple-Principals Agency Theory of Regulation, or 'Let Them Be Bribed'," *Journal of Law and Economics*, 33 (1990).

16. On judicial review and regulator's discretion, see P.T. Spiller, "Agency Discretion Under Judicial Review," *Mathl. Comput. Modelling*, 16/8-9. (1992).
17. For an excellent treatment of legislative and executive institutions, see M. Shugart and J. Carey, *Presidents and Assemblies: Constitutional Design and Electoral Dynamics* (New York, NY: Cambridge University Press. (1992).
18. See B. Weingast, "The Economic Role of Political Institutions: Market Preserving Federalism and Economic Development," *Journal of Law, Economics and Organization*, 7/1 (April 1995): 1-31.
19. Levy and Spiller (1994), op. cit.
20. For a similar treatment of the problem as applied to inflation and fiscal deficits, see S. Edwards and G. Tabellini, "Political Instability, Political Weakness and Inflation: An Empirical Analysis," NBER Working Paper, 1991; S. Edwards and G. Tabellini, "The Political Economy of Fiscal Policy and Inflation in Developing Countries: An Empirical Analysis," World Bank, Mimeo, 1991.
21. Levy and Spiller (1994), op. cit.
22. Despite recent improvements in the institutional environment of the Philippines, investors are still wary of investing in easily expropriable power plants. Their solution has been to place the plants on floating barges which can be moved from one region to another or, potentially, even leave the country if the political environment turns sour. "Napocor Eyes Solution to Power Blackouts," *The Philippine Reporter*, August 31, 1996.
23. POL = (LAW + 1/7 (FED + DUAL + BICAM + LEGEFF + MILIT + REL + PART) + 1/3 (BUREAU + CORRUP + TENS))
    POL2 = (JUDTEN + 1/7 (FED + DUAL + BICAM + LEGEFF + MILIT + REL + PART) + 1/3 (BUREAU + CORRUP + TENS))
24. Law and order, bureaucratic quality, government corruption, contract repudiation. and government expropriation. *International Country Risk Guide*, Political and Financial Risk Tables, several issues.
25. R. Gastil, *Freedom in the World: Political and Civil Liberties* (New York, NY: Greenwood Press, several years).
26. This sample is not substantially different from the larger sample as is evidenced by the summary statistics in Appendix Table 3 and the replication of the regressions presented in Table 1 for the smaller sample presented in Appendix Table 4.
27. K. Jaggers and T.R. Gurr, "Polity III: Regime Change and Political Authority, 1800-1994," computer file, Interuniversity Consortium for Political and Social Research, Ann Arbor, MI, 1996.
28. I. Gorvin, Elections Since 1945: A Worldwide Reference Compendium (Chicago, IL: St. James Press, 1989).
29. J.D. Derbyshire and I. Derbyshire, *Political Systems of the World* (New York, NY: St. Martin's Press, 1996).
30. Note that recent similar empirical work in macroeconomic growth and international business has focussed on measures of economic outcomes such as government expropriation of private sector assets, repudiation of contracts by government, manager's perception of political risk and patent protection. The measures developed here differ in that they explicitly examine the role of political

institutions as determinants of economic outcomes. For macroeconomic growth, see S. Knack and P. Keefer, "Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures," *Economic and Politics*, 7/3 (1995); P. Mauro, "Corruption, Country Risk and Growth," *Quarterly Journal of Economics* (1995); R. Barro, "Democracy and Growth," *Journal of Economic Growth*, 1/1 (1996); S. Borner, A. Brunetti, and B. Weder, *Political Credibility and Economic Development* (New York, NY: St. Martins Press, 1995); N. Campos and J. Nugent, "Institutions and Economic Growth in Latin America: An Econometric Study," unpublished manuscript, 1996; R. La Porta et al., "Legal Determinants of External Finance," National Bureau of Economic Research, Working Paper No. 5879, 1997. For international business, see S. Agarwal, and S. Ramaswami, "Choice of Foreign Market Entry Mode: Impact of Ownership, Location and Internalization Factors," *Journal of International Business Studies*, 23/1 (1992); K. Brouthers, "The Influence of International Risk on Entry Mode Strategy in the Computer Software Industry," *Management International Review*, 35/1 (1995); J. Oxley, "International Hybrids: Transaction Cost Treatment and Empirical Study," Dissertation manuscript, Haas School of Business, University of California, Berkeley, 1995.

31. Note that similar results were obtained using the measure of effectiveness of the legal system from Mauro [op. cit.] and are available from the author upon request.