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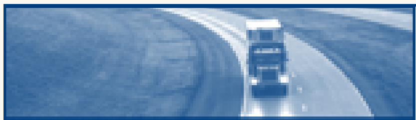

INFRASTRUCTURE

Privatization and Regulation in Latin America

*Alberto Chong and Juan Benavides**

1. Introduction

During most of the twentieth century, Latin America policymakers favored state ownership and management of infrastructure. Yet, state-owned enterprises generally performed, and continue to perform, poorly. With a few exceptions, they have proved wasteful and inefficient, tending to produce goods and services of low quality and high cost. Moreover, these enterprises became seriously overstaffed as gov-

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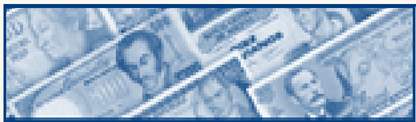

FINANCIAL MARKETS

Institutional Quality, Knightian Uncertainty and Insurability: A Cross-Country Analysis

*S. Nuri Erbas and Chera L. Sayers**

1. Introduction

The development of an economy's insurance sector should be placed in the broader context of financial sector development as a vehicle of economic development. The literature shows that there is a strong correlation across countries between the level of insurance coverage and level of income.[1] Moreover, increasing insurance coverage may be correlated with higher growth.[2] Increasing attention in the

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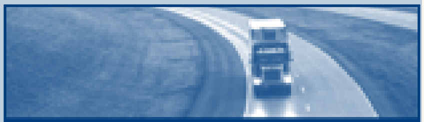
(1) For example, see Outreville, F. 1990. "The Economic Significance of Insurance Markets in Developing Countries." *Journal of Risk and Insurance* 57:487–98.

(2) Ward, D. and R. Zurbruegg. 2000. Does Insurance Promote Economic Growth? Evidence from OECD Countries. *Journal of Risk and Insurance* 67, no. 4: 489–506.



▶ p.1 *Privatization*

ernments used them as a source of employment. Sheltered from competition, state-owned enterprises often were instructed to keep their prices below the cost recovery level in order to meet other government goals. This resulted in rising financial losses that in some cases amounted to as much as 5 to 6 percent of gross domestic product. This, in turn, led to bailouts and fiscal strains, first on government budgets and later on the banking system. Covering state-owned enterprise losses with fiscal transfers required governments to finance larger fiscal deficits and increase tax revenues, or, more commonly, reduce public expenditures in other areas, or both.

Private participation in infrastructure became an inevitable alternative to address the problems thus created. The Latin American region pioneered private participation in infrastructure, accounting for about half of the US$786 billion investment in developing countries between 1990 and 2003. While on balance, privatization and other forms of private participation have had a positive contribution to welfare,[1] in some cases it was used in cases where (in hindsight) competition or independent regulation had little chance to flourish and deliver the expected results. Overoptimism and conceptual simplification resulted in a large number of disputes and breaches of concession contracts, which were exacerbated by technical inexperience in the design of bids in weak legal, fiscal and institutional environments.

The conceptual advantages of competition and regulation over public command and control are well established. The literature emphasizes two reasons for the poor record of state ownership. First, the managerial strand of the literature highlights the idea that imperfect monitoring and poor incentives for managers of state-owned enterprises translate into inferior performance. There are many reasons to believe this would be so. The average state-owned enterprise is not traded on the stock market and the threat of a takeover does not exist because control rests in the hands of the state. The discipline that creditors would exercise does not play much of a role because most loans to state-owned enterprise are public debt and losses are typically covered by subsidies from the treasury. Additionally, the boards of directors rarely implement good corporate governance practices and management turnover obeys political rather than market forces.

The second strand of the literature emphasizes the political economy aspects of state production. The political view points to the inherent conflict of interest in running state-owned enterprises, as managers seek to maximize their political capital and, as a result, pursue inefficient decisions. Political interference in the firm's production results in excessive employment, poor choices of products and location, and inefficient investment. State-owned enterprises face soft budget constraints that allow them to implement such practices, as governments may not want to risk the political cost of firms going bust. The basic claims of the two strands of the literature have been validated by empirical research on state-owned enterprises and firm performance after privatization around the world.

2. The Extent of Privatization in Latin America

There are dramatic differences in the extent of privatization in the region. For example, countries with previously large state-owned enterprise sectors, such as Ecuador, Nicaragua and Uruguay, barely privatized in the 1990s, while others such as Argentina, Bolivia, Guyana, Panama and Peru have raised revenues from comprehensive privatization programs that amount to over 10 percent of gross domestic product. The difference in the extent of privatization across countries and the large amount of assets in the hands of the state highlight the importance of understanding the privatization record so far and of developing lessons for future privatization programs. In fact, the above points towards a common misconception regarding privatization in the region given that a relatively large number of countries have been reluctant to privatize.

Seventy-five percent of the revenues from privatization in Latin America came from utilities and infrastructure and 11 percent came from the financial sector. The remainder was made up oil, gas, and manufacturing. In fact, relatively recent large sales have been concentrated in the oil and gas sectors in Argentina and Brazil. Manufacturing privatizations raised about 16 percent of total developing country proceeds between 1990 and 1999 of which, in regional terms, Latin America accounted for a large share of non-OECD privatization activity, particularly in terms of revenues. At first, countries such as Argentina, Brazil, Bolivia, Chile and Mexico

(1) Chong, A. and F. Lopez-de-Silanes (Eds.). 2005. *Privatization in Latin America: Myths and Reality.*, Palo Alto, CA: Stanford University Press.

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sold small and medium-sized firms, but they rapidly expanded their program to include large infrastructure and energy firms. In recent years, the largest privatizations involved the sale of infrastructure and/or energy firms in Brazil, Argentina and Mexico. Interestingly, manufacturing has not been important, except for some old strategic heavy industries such as steel and aluminum.

The fact that the privatization process in Latin America markedly differs from that of other regions, such as Eastern Europe or Africa, underlines the fact that the determinants of privatization in the region are different. Furthermore, the fact that privatization among the countries of Latin America also differed markedly, provides additional support to the notion that economic factors were not the only ones, and perhaps not even the crucial ones, determining policy choices with respect to privatization. In fact, most countries in Latin America privatized telecoms, electricity, gas and, to a lesser extent, water and sanitation services. However, privatization of railways, airlines, airports and highways was less extensive. It was not as important to privatize financial and productive industries because they already had private participation. With the exception of Argentina, most countries had at least one public bank and retained public control of companies connected with natural resources such as oil, gas and copper. For example, although Brazil pursued a relatively large privatization program it still retained state participation in electricity, the financial sector and oil. Similarly, Colombia, Costa Rica and Uruguay did not privatize their telecommunication companies, although most countries did so. In Peru there was no private sector involvement in transport, sanitation services and a large share of agriculture and oil. Even Chile retained public enterprises in key sectors, namely, copper, oil, banks, postal services, railways and ports. Argentina is a peculiar case because the government did not retain control of any important company with the exception of a few national and provincial banks and some provincial sanitation companies. In contrast, Uruguay has had the fewest privatizations in the region. In fact, it is the only country that did not privatize electricity, oil or telecoms and put the issue of privatization on the ballot. No other country has shown this level of popular participation in the privatization debate.

The sequence of privatization differs among countries in the region. Bolivia, Chile, Mexico and Nicaragua first privatized state-owned enterprises in competitive sectors, such as manufacturing and finance, and moved later to monopolies and utilities. Countries such as Argentina, Brazil, Colombia and Peru sold both types of companies simultaneously. In Bolivia and Argentina the monopolistic structure of some sectors was maintained in order to maximize revenues, even in sectors like telecoms where technology allowed increased competition. Governments used different methods to sell state-owned enterprises to the private sector, including: the total sale of the enterprise through open international options, public offerings of shares, concession contracts, direct transfers and other methods. The intensity in the use of each privatization strategy differed across countries. For example, while Argentina, Mexico, Chile and Peru sold state interests outright, Bolivia relied on capitalization schemes. Throughout the region, concession contracts were used mainly in sanitation services, transport infrastructure, and oil exploration and production.

As Megginson argues,[2] these differences simply highlight the fact that deciding which sectors and public enterprises should be privatized is quite a contentious affair. This is especially true if privatization is adopted by a highly divided government. A privatizing government facing sharp opposition typically feels that it must act quickly and maneuver around political opposition, as well as opposition from government bureaucrats and the workers and managers of the state-owned enterprises. Governments in these positions face the real prospect of losing power and also seeing the entire privatization and economic reform halted if any mistakes are made. In theory, the choice of which sectors to privatize should be straightforward. Some sectors, such as retail or light industry operating in competitive industries will be relatively easy to sell off, while others (particularly heavy industry and infrastructure assets) will be far more difficult and require more preparation.

Retail trade, consumer services and housing already have some degree of private participation in most countries, as a result, relatively little supplemental capital investment is required to make the state assets competitive. Privatization of these sectors should be attractive and relatively noncontroversial. Light industry may require substantial investment (perhaps foreign direct investment) to become economically viable. Heavy industry also requires additional investment and may be considered strategic and placed off-limits (Megginson, 2005). This is the case of copper in Chile, power in Brazil and oil in Peru, for example. The banking, telecommunications and electricity sectors face the same challenges as heavy industries and, in addition, require the establishment of regulatory institutions (these industries are regulated everywhere in the world). The sequence of privatization in electricity differs according to the level at which public ownership is involved (municipal, state or national), the dominant type of public power generation technology, and the way subsidies were defined and transferred. In countries like Guatemala and Nicaragua, public hydroelectric plants that have been already repaid (sunk costs with almost zero operating costs) subsidize consumption for most of the population. It is therefore unlikely that generation will privatized because the fiscal system of these countries is currently unable to support direct transfers to customers (which would have to take place if the privatized companies are to charge a tariff). However, distribution firms in these countries were quickly

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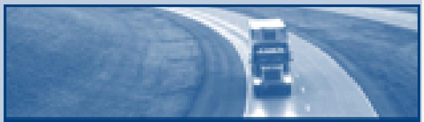
(2) Megginson, W. 2005. *The Financial Economics of Privatization.* Oxford, UK: Oxford University Press.



▶ p.3 Privatization

privatized because they were part of a single state-owned distribution firm with national coverage. To the contrary, large hydroelectric plants owned by the central government were among the first assets to be privatized in Colombia (due to fiscal pressures), while privatization in the distribution business has been slow because many of the firms are controlled by subnational governments with little interest in losing their control.

3. Privatization Record

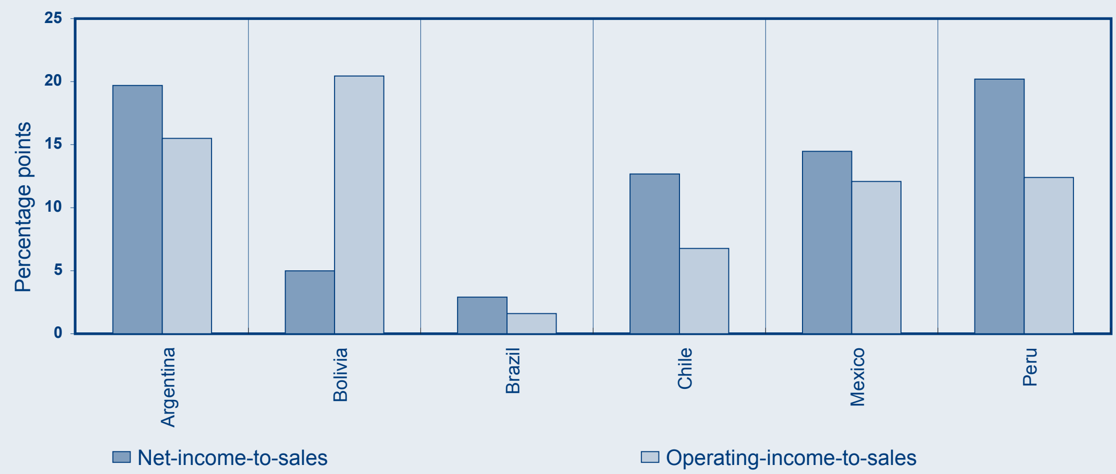
Using comprehensive data, a recent research effort across Latin America has expanded the detailed privatization analysis for the region, helping us address the concerns raised in this section. The basic results for the sample of Latin American countries are presented below. There were substantial gains in profitability after privatization, measured by net-income-to-sales and operating-income-to-sales ratios. For the countries in the sample, the median net-income-to-sales (operating-income-to-sales) ratio increased 14 percentage points. The largest gains are in Peru and Argentina, where median changes reached about 20 percentage points. Brazil shows the smallest gains, between 2 to 5 percentage points depending on the ratio. Unlike their counterparts in other countries, in Colombia, Uruguay and Cost Rica some large state-owned enterprises were profitable before privatization. For instance, relatively high profitability in Colombia is explained in part by protective industrial policies implemented during the 1980s, which, in the case of telecommunications, implied a public monopoly over long distance calls.

The main reason behind the profitability gains is the improved operating efficiency brought about by privatization. In fact, unit costs plummeted; the median decline was equivalent to 16 percent for the countries with available data. The sales-to-asset ratios show a similar rising trend in 4 out of 5 countries. The median country increase in this ratio is 26 percent. Peru is the only country to post a decline of about 20 percent in sales-to-assets as privatized state-owned enterprises engaged in large investments that overtook output increases. Finally, the impact on sales-to-employment is dramatic with a median gain of almost 70 percent. Chile and Mexico show the most impressive results, as sales-per-employee doubled. The analysis so far suggests that the profitability gains of privatized firms are mostly due to efficiency gains and not to other factors. Most countries show drastic cuts in employment and fairly consistent capital stocks. Perhaps the most striking finding is that the output of privatized state-owned enterprises dramatically increased, despite dwindling employment and modest investment. The largest gains are in Mexico and Colombia, where median output increased 68 and 59 percent respectively. The country with the lowest, albeit significant, increase in output is Brazil, where real sales went up 17 percent. Some of these findings are shown in Figures 1 and Figure 2.

4. The Challenge for Governments: Regulation

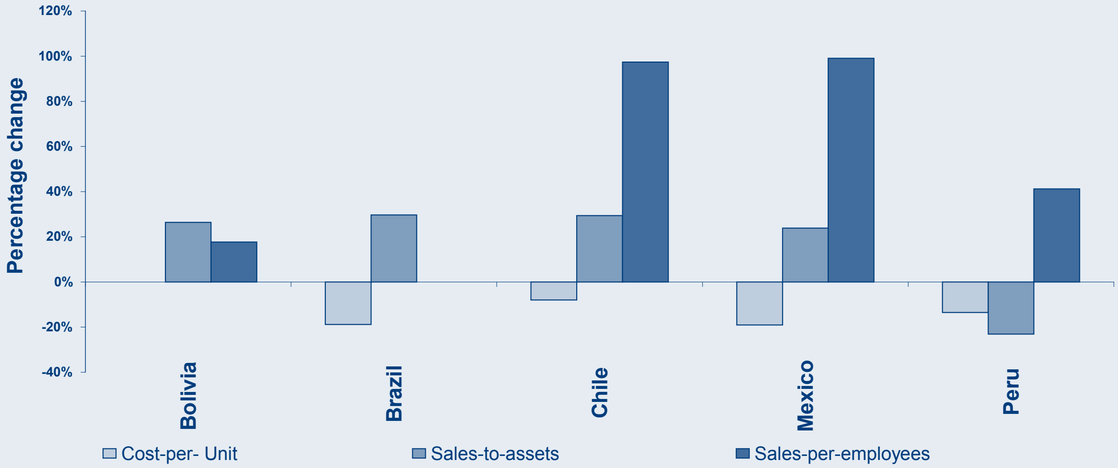
There is no question that an appropriate regulatory framework after privatization is a key challenge for governments. This is particularly true in the case of the majority of utilities, which make basic services available to the poorest. Based on the existing evidence, a common element across many failed examples of privatization is inadequate regulation leading to sub-optimal levels of competition or allowing producers to keep the gains from privatization rather than sharing them with consumers. While the classic position of critics is to turn this into an argument against further privatization, ample em-

Figure 1: Profitability Changes After Privatization



Source: A. Chong and F. Lopez-de-Silanes (2005).

Figure 2: Operating Efficiency after Privatization



Source: A. Chong and F. Lopez-de-Silanes (2005).

pirical evidence shows that privatization can be done correctly, and can lead to social gains. This should be enough to discard a simplistic interpretation of cases of failures.

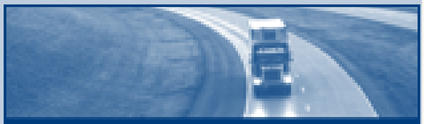
There are two ways in which credible regulation complements privatization. At the most basic level, product market competition provides a tool to weed out the least efficient firms. This process may take too long, or not work at all, if regulation inhibits new entry or makes exit costly. Secondly, an adequate regulation may also complement privatization by raising the cost of political intervention. Whereas an inefficient monopoly can squander its rents without endangering its existence, an inefficient firm in a competitive industry would have to receive a subsidy to stay afloat. The introduction of competition forces politicians to have to pay firms directly to engage in politically motivated actions whereas before the costs of these measures were absorbed by an SOE that did not have to worry about market performance. In fact, competition is often restricted precisely because it raises the costs of political influence.

Generally speaking, adequate regulation can take place at three different moments: before privatization, at the time of privatization or after the state-owned enterprise has been sold. The literature has emphasized the importance of having efficient regulation at an early stage. Regulation before privatization of the industry may increase the pace of divestiture and help sell companies at a higher price if it reduces regulatory risk as Bortolotti, Fantini and Scarps argue for the case of the electric sector.[3] Wallsten finds that countries that established a separate regulatory authority in telecommunications prior to privatization not only benefited from increased telecom investment and telephone penetration, but also gained from investors' willingness to pay more for the telecom firms.[4] However, it is not easy to establish effective pre-privatization regulation for at least three reasons: First, changes to the regulatory regime prior to privatization are likely to lower state-owned enterprise profits, translating into higher financial needs for the government at a very difficult time. Second, without the pressure of imminent privatization, the political will for a true regulatory reform might not materialize. Finally, governments with little experience in privatization often find it difficult to carry out an effective pre-privatization regulatory reform.

Regulations established at the time of privatization (clarifying the new set of rules) solve the first two problems and reduces regulatory risk discounts. There is evidence that as long as a suitable regulatory framework is in place at or before the time of privatization, consumers and the government should benefit from the process. Lack of regulatory capabilities at the time of privatization coupled with a desire to maximize price at the time of the sale has led several governments to postpone full and clear regulation. Trying to establish an adequate regulatory scheme after privatization may be problematic from a political economy perspective. Since the agency in charge of enforcing and regulating the contracts is often the same or a subordinated entity to the agency that carried out the privatization, there is an incentive for lax enforcement to avoid exposing past mistakes. Chong and Sánchez document that for a broad number of concessions in infrastructure projects, the private sector was able to bargain and keep protective regulation

▶ p.6

(3) Bortolotti, B., M. Fantini, and C. Scarpa. 2001. "Privatisation: Politics, Institutions and Financial Markets." *Emerging Markets Review* 2:109-136.
(4) Wallsten, S. 2002. "An Empirical Analysis of Competition, Privatization, and Regulation in Africa and Latin America." *Journal of Industrial Economics* 49:1-19.



▶ p.5 *Privatization*

after privatization because of the threat of bankruptcy, withdrawal, or desertion of future investment commitments. All of these have an impact on the reputation and credibility of privatizing politicians.[5] According to evidence presented in Guasch,[6] in the last 15 years, concession contracts in developing countries have often led to renegotiations. In Latin America and the Caribbean, 40 percent of all concession contracts were renegotiated just over 2.2 years after they were signed. Engel et al. argue that opportunistic renegotiations of concessions are common because of a "privatize now, regulate later" approach.[7] Cost overruns in concessions and unclear rules governing contingencies provide private owners with the opportunity to extract economic rents from the government. Finally, attempting to substantially alter the regulatory framework after the sale may also prove difficult as new constituencies against regulation are created at the time of privatization. Shareholders and managers of privatized state-owned enterprises are joined by workers and even consumers who could benefit from the protective regulatory status of firms.

A final caveat on the power and scope of regulation in Latin American countries should be made. Regulation's performance cannot be assessed in isolation. Regulation can be viewed as a component of the "institutional possibility frontier" of an industrial sector. Other components might include the antitrust bodies, the courts, the executive power and both the national and the local levels, and the sector ministry, in the case of utilities. Countries with strong presidential regimes are often reluctant to grant actual independence to a regulator. Also, countries where politicians have room to interfere with decisions to limit the ability of the judiciary are prone to have lower de facto independence of the regulator. Additionally, in the smallest and poorest countries, privatization of an asset may become the single most important business event of the country in several years, which provides a fertile ground for developing a strong bilateral relationship between the executive power and the firms. In those contexts, the decisions of the executive power may override the competences of other sector institutions, leaving regulation out of the role that it should perform. In sectors like water and sanitation, which can comprise hundreds of isolated and heterogeneous firms at the subnational level and in countries where the key problem is insufficient coverage, more than a centralized regulator will be needed to reach decent sector outcomes. The quality of regulation will be strongly complementary with the decisions of sector and local authorities. Coordination of regulation with the relevant institutions will be the highest priority in those cases. The above is particularly important in light of the big wave of new independent or semi-independent regulatory agencies in the region, going from 43 regulatory agencies in 1979 to 134 in 2002.

5. Concluding Remarks

Privatization in Latin America started earlier and spread farther and more rapidly than anywhere else in the world. In the 1990s the accumulated privatization revenues in 18 Latin American countries reached 6 percent of gross domestic product. From 1990 to 2001 private investment in infrastructure alone reached $361 billion. More firms, and larger ones were sold in the region and more proceeds were raised than in almost any other part of the world. However, privatization was not created equal in the region. Differences among countries are dramatic. Privatized sectors and the potential for further privatization depend on the country and appear not to be linked with purely economic variables, but with the institutional endowment and the rule of law. Still, the overall privatization record is remarkable, which is quite paradoxical with the current idea that privatization is negative for societies.

In fact, public opinion and policymakers in Latin America and other regions of the world have turned against privatization, and a large political backlash to privatization has been brewing for some time. These findings do not mean that failures do not occur, but rather that they are not the norm. Most instances of failure can be explained by three factors. First, opaque processes with heavy state involvement open the door to corruption and opportunistic behavior. Second, poor contract design and regulatory capture are linked to a lack of adequate regulation. Overall, a political economy approach explains why it is hard to bring about changes in regulation after privatization and why privatized firms are frequently able to renegotiate their contracts on more favorable terms. Despite the regulatory advances in the region, it is advisable to push for changes in the regulatory framework, as the variance in the region is quite high. However, one needs to be aware that perfection in developing a new regulatory framework may take a lot of time. Recourse to constrained solutions may be required in the short term, avoiding the return to the mistakes of statism and the conceptual simplification that pushed the private alternative in circumstances where (with hindsight) it had little chances to flourish. Pro-growth policies linked with improvements in the business climate and the institutional endowment will make the private option increasingly feasible in the long run, once third-party enforcement of legal property rights becomes generalized accepted. ■

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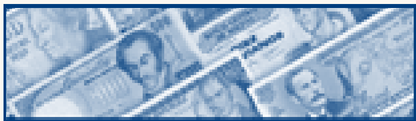
(5) Chong, A. and J. M. Sánchez (Eds.). 2003. *Medios privados para fines públicos: Arreglos contractuales y participación privada en infraestructura en América Latina*. Washington, D.C., United States: Inter-American Development Bank.

(6) Guasch, J. L. 2004. *Granting and Renegotiating Infrastructure Concessions: Doing it Right*. Washington, D.C.: World Bank.

(7) Engel, E., R. Fischer and A. Galetovic. 2003. "Privatizing Highways in Latin America." *Economia, Journal of the Latin American and Caribbean Economic Association.*



▶ p.1 *Cross-Country Analysis*

literature on the connections between institutional quality and economic development has focused on the incentive effects of institutions on investment (e.g., property rights). An equally fundamental role of institutions, at least in the context of financial market development, is reducing economic uncertainty through market structures that serve to diversify risks. Therefore, insurance market development has a direct impact on investment and on economic development in general.

In his landmark contribution, Knight examines “structures and methods for reducing uncertainty.”[3] Those methods include increasing scientific knowledge and accumulation of data (e.g., actuarial data), along with consolidation and specialization by means of the large-scale organization of economic activity. Uncertainty is consolidated and its costs are diversified through integrated business organizations and specialized markets, such as insurance markets. Thus, decisionmakers “shift” uncertainty to specialists, making the unquantifiable uncertainty confronting decisionmakers more quantifiable and “priceable.” The presence of developed insurance markets and insurance coverage helps lower interest rates and stimulate investment, as well as extend the time horizon of investment, all of which are factors leading to higher growth and development in the long run. Consolidation, specialization, and generation and dissemination of data to enable systemic and scientific control of economic decisions are the main underlying characteristics that define robust market institutions.

Although many other aspects of financial sector development have received ample attention in IMF work, the insurance sector has received less emphasis but has come under closer scrutiny recently. This paper establishes an analytical link between insurance sector development and institutional development by examining the following specific question: what are the main underlying factors that determine the level of insurance coverage across countries? Income level is a principal determinant, along with financial depth, cost (price) of insurance and country risk. However, income levels across countries are significantly correlated with institutional quality. If institutional factors are good indicators of income level, they may be the underlying determinants of the level of insurability across countries. Our main hypothesis is that institutional quality is a good indicator of the level of uncertainty and transparency and, therefore, of insurability in a given country.

We interpret transparency in the context of Knightian uncertainty (ambiguity). We argue that there is a critical link between greater institutional strength and greater transparency, which, in the Knightian context, can be interpreted as less uncertainty. The linkages between institutional quality, transparency, uncertainty and insurability deserve analytical attention. In the absence of robust market institutions, uncertainty is higher. In general, it is plausible to postulate that higher uncertainty in a country implies lower insurability. It is also reasonable to postulate that lower institutional quality in a country implies lower transparency, and hence higher uncertainty and lower insurability. Therefore, to the extent that income level in a country is correlated with the level of institutional quality and institutional quality reflects on the degree of uncertainty, institutional quality can be hypothesized to be the “deeper” determinant of insurability.

This argument is further inspired by some important experimental findings on decision making under uncertainty conducted at the individual level. Even in developed insurance markets, there is considerable uncertainty about some types of contingencies to the extent that markets fail to provide adequate insurance coverage. Notable examples are catastrophe insurance, for example, floods, earthquakes and tsunamis.[4] Due to uncertainty, insurers may ask a price based on the worst (highest) hazard probability and the buyers offer a price based on the best (lowest) hazard probability; thus, uncertainty may create a wedge between the seller’s and buyer’s prices and result in market failures. Similarly, in many countries, institutional weaknesses may also result in economic uncertainty, which may deter insurance market development and result in low insurance coverage.

This paper’s focus is on non-life insurance markets across a sample of 70 countries.[5] The dataset is described in Box 1. Broadly, non-life insurance includes all insurance excluding life insurance and pensions. The paper’s contribution is examining whether the institutional quality-transparency-uncertainty nexus is a significant determinant of non-life insurability. The main finding is that this nexus is the dominant determinant of insurability across countries, surpassing the explanatory power of income level.

2. Institutional Quality and Knightian Uncertainty: An Interpretation

We postulate that the World Bank governance indexes (WBIs) are good indictors of the degree of Knightian uncertainty because they are based on subjective evaluations of the various aspects of governance that determine the range of possible events and outcomes of economic decisions. Probabilities and payoffs associated with economic deci-

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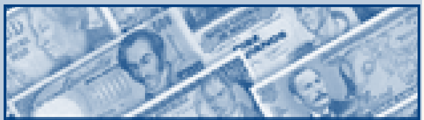
(3) Knight, F. 2002. *Risk, Uncertainty and Profit* (originally published in 1921). Washington, D.C.: Beard Books.

(4) See Dacy, D. and H. Kunreuther. 1969. *The Economics of Natural Disasters, The Implications for Federal Policy.* New York: Free Press. Also see Froot, K. 1999. *Financing Catastrophe Risk.* Chicago: University of Chicago Press. More recently, terrorism insurance has also called for government intervention (subsidies to insurers, incentives for the insured).

(5) A significant indicator of insurability is non-life insurance penetration in a country, as measured by gross non-life insurance premiums paid as a percentage of GDP, which is the measure we use in this paper. For brevity and better focus, we exclude life insurance penetration, which reflects factors in addition to those considered in this paper, such as life expectancy, presence of social security, education levels, and cultural factors like religion.



▶ p.7 Cross-Country Analysis

sions are not possible to ascertain with the precision of a one dollar bet on the flip of a coin. Using Herbert Simon's terminology, against the background of the substantive problem of uncertainty about probabilities and payoffs in the Knightian sense, in reality, economic decisions are made in a procedural way (procedural rationality), based on subjective evaluations of risk according to the norms provided by the institutional environment. Even in actuarially sophisticated decisions such as insurance decisions, a degree of ambiguity remains because such decisions cannot be exhaustive to the extent that all possible contingencies are evaluated, including contingencies that are the products of a given institutional environment. The institutional environment provides the "satisficing" decision framework in the form of a set of suboptimal norms, which determine the rules of the game that guide procedural economic decisions. The degree of reliability of the norms, as perceived by economic actors, determines subjective evaluations of economic risks. Weak voice and accountability has an important bearing on transparency of policy decisions—erroneous, discretionary and discriminatory policy actions are more possible and they are less likely to be redressed without accountability. Political instability indicates the possibility of fundamental changes in policies from one regime to the next. Similarly, perceptions of government effectiveness, regulatory quality, rule of law, and control of corruption are the subjective determinants of the risks associated with the implementation of policies and rules.

For example, insurers might have an adequate actuarial assessment of fire hazard in a given country, based on the quality and density of housing, access to fire hydrants and fire companies, and so on. But if the police and fire company reports are not reliable (e.g., due to corruption), or, if the institutions which adjudicate the cases that go to court are weak (e.g., due to lack of specialized courts; long delays in case resolution), then many more layers of uncertainty are added to the assessment of insurability by insurers. Consumers might make actuarially sophisticated decisions about purchasing fire insurance based on objective criteria but an assessment of the

Box 1. Data Description and Sources

Variable	Description and Sources
Non-life insurance penetration (NLP)	Annual gross non-life insurance premiums , 1994-2003 averages. *Source*: Swiss Re SIGMA Insurance Research; Swiss Re Public Web Site.url
Institutional quality indexes (WBI)	WBI comprise: (a) voice and accountability; (b) political stability; (c) government effectiveness; (d) regulatory quality; (e) rule of law; (f) control of corruption. WBIs rank each country such that a low index number indicates a low ranking and a high index number indicates a high ranking. In each World Bank governance index category, the simple average of a country's rank (0-100) in 1996, 1998, 2000 and 2002 is taken. In order to calculate an overall index (not provided by the WB), the simple average of the 1996-2002 indexes for each country is used. *Source*: Kaufman, D., A. Kraay and M. Masfruzzi. 2004 (revised version April 5). Governance Matters III: Governance Indicators for 1996-2002. Policy Research Working Paper. Washington, D.C.: The World Bank Development Research Group and World Bank Institute. Governance, Regulation and Finance Division.
Country risk (CORISK)	Composite risk ratings by the International Country Risk Guide. Average of 1992-2002 yearly ratings. In contrast to WBI, composite risk ratings assign a low value to a high risk country and a high value to a low risk country. *Source*: http://www.icrgonline.com
Cost (price) of insurance (C/P)	Ratio of gross claims to gross premiums. Average of annual data for 1996-2003, as available. Only a sample of insurance companies operating in a country report such data to the data provider. Therefore, the ratios calculated for each sample country do not reflect the country-wide ratios. C/P is included as an independent variable to reflect the cost of insurance on insurance supply. From the demand side, the inverse of the C/P ratio can be interpreted as a proxy for the price of insurance to consumers (Outreville, 1990). *Source*: Insurance Information and Statistics (ISIS) database. Bureau van Dijk, Brussels, Belgium. brussels@bvdep.com
M2; GDP; real per capita income in 1995 U.S. dollars (PCI)	M2/GDP ratio is used as a proxy for financial sector depth. Average of 1994-2003 annual data for M2/GDP; average of 1994-2001 annual data for real per capita income. *Source*: IMF International Financial Statistics.

likelihood that they will actually collect in a timely fashion might be ambiguous. Such uncertainties are at least difficult and often impossible to quantify; therefore, they may be based on subjective evaluations of the soundness of governance and the institutional environment. Thus, weak governance may increase uncertainty both for the insurer and consumer, and result in low insurability.

3. Methodology and Empirical Results

We deploy a general model where the dependent variable is the vector of values in the non-life insurance penetration sample (NLP). The independent variables are vectors of real per capita income (PCI), financial depth, country risk (CORISK), cost of insurance, and the various WBIs. All variables are normalized. Because we believe this is the first empirical study to examine such linkages in a cross section of countries, we first explore the extent of cross-correlation between the variables. The relevant test indicates that per capita income and composite risk index are very significantly correlated with WBIs, as well as with each other. We therefore take the proper control measures to reach meaningful outputs. Generally, the results are statistically robust. Most WBIs—notably, the overall and voice and accountability indexes—outperform PCI, as well as the other independent variables, in explaining NLP variation across the sample countries.

Two of the results are illustrated in Tables 1 and 2 (the results that are statistically significant at the 5 percent level or more are highlighted). As expected, the WBI coefficients are positive, that is, higher ranking in institutional quality indicates higher insurability; most WBI coefficients are more statistically significant than the other independent variables. Interestingly, the C/P variable (the ratio of non-life insurance claims to premiums) also has high explanatory power, outperforming per capita income, and the political stability and rule of law indexes; however, the C/P coefficient is positive, which is puzzling because it indicates that high cost of insurance corresponds to high insurance coverage. It may be possible to interpret this result as an indication of higher quality and, therefore, higher cost of insurance in more developed countries. It is also possible that insurance claims are more likely to be honored by insurance companies in more developed legal and financial systems. This might also imply that non-life insurance penetration rises as the price of insurance declines. This points to the possibility that, in countries with better governance, insurance is less expensive because uncertainty is lower.

When PCI is dropped as an independent variable to see if the NLP-WBI correlations become stronger, we obtain results broadly similar to those in Table 2 but the explanatory power of WBIs becomes higher. In turn, when the regression is run excluding WBIs but including PCI, PCI remains statistically insignificant.

When both PCI and CORISK are dropped, we obtain results similar to the results in Table 2; however, now the significance of WBIs rises and all WBIs become individually statistically significant. When the regression is run including PCI but excluding CORISK and WBIs, PCI becomes statistically significant; however, compared to most WBIs, PCI is less significant than the overall WBI index and voice and accountability index. When the regression is run including CORISK but excluding PCI and WBIs, we find that most WBIs outperform CORISK.[6]

4. Conclusions

The foregoing results show that, when institutional quality, as proxied by the World Bank governance indexes (WBIs), is taken into consideration, PCI (per capita income) is not a significant determinant of non-life insurance penetration (NLP) across the sample countries. Similarly, WBIs also outperform CORISK (composite risk). Cost (price) of insurance (C/P) is significant, while financial depth (M2/GDP) is insignificant. However, most WBIs (in particular, the overall index, the voice and accountability and regulatory quality indexes) outperform PCI and the other independent variables in explaining NLP. These results suggest that PCI is a "catch-all" variable that captures the impact of a variety of factors on the level of NLP, including institutional quality and uncertainty.

Therefore, a good case can be made that institutional quality, as it reflects on uncertainty, is the deeper determinant of insurability. Institutional quality is one of the main determinants of income level, as well as the presence of unquantifiable risks or Knightian uncertainty, across countries. When institutional quality is lower, uncertainty is higher and insurability is lower; at the same time, income levels tend to be lower. To the extent that non-life insurance penetration is a good indicator of insurability and WBIs are good indicators of Knightian uncertainty, the results support our main hypothesis that the institutional quality-transparency-uncertainty nexus is the dominant determinant of insurability. In general, weak governance results in uninsurable risks, at least, it tends to make risks more difficult to quantify, which results in lower insurability. Using Knight's argument, "the structures and methods for reducing uncertainty" are not as developed and are undermined by weak governance in countries where insurance coverage is low.

An important policy implication of our findings is that insurance market development should be a priority in the broad policy of promoting financial sector development. Lower uncertainty due to higher insurability is likely to induce higher domestic and foreign investment. To the best of our knowledge, plausible correlations between investment flows, Knightian uncertainty, and the level of insurance coverage across countries have not been examined. We propose such an examination for future research. ■

(6) Since the CORISK index assigns low values to high risk countries and conversely, our prior is that the sign of its coefficient should be positive, that is, NLP is high when CORISK value is high, and conversely.

Table 1. Non-Life Penetration Regressions

	1		2		3		4		5		6		7		8	
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
Intercept	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real per capita income (PCI)	0.2	1.5	0.2	1.5	0.2	1.6	0.3	1.6	0.3	1.7	0.3	1.7	0.3	1.7	0.3	1.6
M2/GDP	-0.3	-1.2	-0.4	-1.7	-0.2	-1.5	-0.1	-0.2	0.0	0.1	-0.1	-0.3	0.1	0.6	0.0	0.1
Composite risk (CORISK)	0.2	1.5	0.0	0.4	0.1	1.5	0.0	0.5	0.0	0.1	0.0	0.3	0.0	0.2	0.0	0.2
Non-life claims/premiums (C/P)	**0.2**	**2.0**	0.2	1.6	0.2	2.0	**0.2**	**2.2**	0.2	1.8	**0.2**	**2.0**	**0.2**	**2.0**	0.2	1.8
Overall index			**0.8**	**3.2**												
Voice and accountability	**0.6**	**4.1**			**0.7**	**5.5**										
Political stability	0.1	0.7					0.3	1.3								
Government effectiveness	0.0	0.0							**0.2**	**1.0**						
Regulatory quality	0.1	0.3									0.4	2.3				
Rule of law	-0.3	-0.7											0.1	0.4		
Control of corruption	0.2	0.5													0.2	1.0
Adjusted R^2	0.5		0.4		0.6		0.4		0.4		0.3		0.3		0.4	
Multiple R^2	0.8		0.7		0.8		0.6		0.6		0.6		0.6		0.6	

Source: Authors' estimates

Table 2. Non-Life Penetration Regressions Excluding PCI

	1		2		3		4		5		6		7		8		9	
	Coef.	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**	**Coef.**	**t**
Intercept	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real per capita income (PCI)																	0.3	1.7
M2/GDP	-0.2	-0.8	-0.3	-1.3	-0.1	-0.7	0.1	0.4	0.2	0.9	0.1	0.7	0.3	1.3	0.2	0.8	0.2	1.2
Composite risk (CORISK)	0.2	1.6	0.0	0.4	0.1	1.6	0.1	0.5	0.0	0.1	0.0	0.3	0.0	0.2	0.0	0.2	0.0	0.3
Non-life claims/premiums (C/P)	**0.2**	**2.2**	0.2	1.9	0.2	2.3	**0.3**	**2.6**	**0.3**	**2.2**	**0.3**	**2.4**	**0.3**	**2.3**	**0.2**	**2.1**	**0.2**	**2.2**
Overall index			**0.8**	**3.3**														
Voice and accountability	**0.6**	**4.2**			**0.7**	**5.6**												
Political stability	0.2	0.8					0.3	1.4										
Government effectiveness	0.0	-0.1							**0.2**	**1.0**								
Regulatory quality	0.0	0.2									0.4	2.3						
Rule of law	-0.3	-0.6											0.1	0.6				
Control of corruption	0.2	0.6													0.3	1.2		
Adjusted R^2	0.5		0.4		0.5		0.3		0.3		0.4		0.3		0.3		0.4	
Multiple R^2	0.8		0.7		0.8		0.6		0.6		0.6		0.6		0.6		0.6	

Source: Authors' estimates

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Book Reviews, Articles and Papers:

Financial Structuring of Infrastructure Projects in Public-Private Partnerships: An Application to Water Projects. *Antonio Vives, Angela M. Paris and Juan Benavides (IDB), Peter D. Raymond, Darío Quiroga and Javier Marcus* (PricewaterhouseCoopers). IDB, Sustainable Development Department. Washington, DC. 2006.

This report sets out an approach and a set of tools for the financial structuring of public-private partnership projects, with a particular application in the potable water and sanitation sector. The analytical framework developed here arose from the experience and insight of investors, lenders, governments, advisors and Inter-American Development Bank staff, in the development and financing of projects in infrastructure in Latin America.

In the most widely publicized version of public-private partnerships, which originated in the United Kingdom with the Private Finance Initiative (PFI), the government contracts with a competitively selected private sector firm to deliver services on its behalf, which often involves building new infrastructure. The firm has to build, operate, maintain and finance the asset, and provide the service for the long term in exchange for recurrent payments from the public sector. At the end of the contractual period the operation of the asset reverts to the government. But this variety of public-private partnership will only deliver under very stringent conditions: there must exist sufficient public funds for the government to comply with its payments schedule; and the judiciary system, regulatory institutions and the dispute resolution mechanisms must be solid enough to minimize the chances of ex post opportunistic behavior. These circumstances do not generally exist in developing countries, where contracts have been breached, arbitrarily changed during the life of the contract, or, very frequently, renegotiated. Most risks are considerably larger and the mitigation tools relatively less developed.

The Inter-American Development Bank took the lead in developing an initial analytical framework that provides an ordered protocol to examine which structures may function or not, according to the context applicable in developing countries. PricewaterhouseCoopers was retained to further develop the concept in concert with the Bank. In this report we develop the continuum of solutions available by examining the conflicts that the private and the public sectors face under various configurations of local conditions that have a significant impact on the investment decisions, and including the application of risk mitigation tools. The approach and tools are meant to serve as a guide to assisting governments and investors in evaluating different options to establish a successful public-private partnership, considering the political and economic realities of each country and within the feasible risk mitigation tools that can be implemented. The principles and analyses presented here, while comprehensive, cannot be considered to cover all possible cases. They are still being researched and refined, thus, feedback and comments are encouraged.

Even though the local conditions, case studies and examples discussed in the report originate in the water and sanitation sector, the framework is by no means restrictive in scope and could be deployed in other infrastructure sectors. We chose the application to the water sector as we considered it to be more complex, because of the wide ranging political implications of the service and also because many of the projects tend to develop at a sub-national level where complications are even larger. The application to energy and transportation would then be a simpler solution that the ones presented. The authors hope that this report will make a contribution to the development of public-private partnerships for the financing of infrastructure projects and in turn lead to an increase in investments in developing countries.

Stern Review on the Economics of Climate Change. *Sir Nicholas Stern.* HM Treasury, Cabinet Office. http://www.cambridge.org/9780521700801. Abstract of the Summary of Conclusions. October 2006.

Sir Nicholas Stern has recently presented this Review that assesses evidence of the impacts of climate change and the associated costs and risks (using alternative estimation techniques). The conclusion is robust: the economic benefits of immediate and strong action outweigh at large the costs of inaction. Climate change will affect the economic and social organization of hundreds of million people who could suffer from hunger, water shortages and coastal flooding. The calculations made suggest that the cost of action could be limited to 1 per cent of global GDP each year, while inaction could lead to losing about 5 per cent of global GDP each year. The scale of the disruptions could reach the levels of those associated with the great wars and the economic depression of the first half of the twentieth century. The investment that would be undertaken in the next two decades are key to the future of climate in the twenty first century.

The key statements of this study are:

(i) Climate change could have very serious impacts on growth and development. All countries will be affected. The poorest countries and populations will suffer earliest and the most, though they have contributed least to the causes of climate change. The costs of extreme weather are

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already rising.
(ii) The costs of stabilizing the climate are large but manageable; the cost of delay would be dangerous and much higher. The annual emission levels that would substantially reduce the risks of climate change are about 80% or less below current levels. This major challenge that could be tackled with sustained long-term action, starting immediately.
(iii) Action on climate change is required across all countries, and it need not cap the aspirations for growth of rich of poor countries. The costs of acting are unevenly distributed scross sectors or around the world. Developing countries can contribute to cut emissions, but they should not be requires to bear the full costs of reduction, and they will not have to be. Carbon markets in rich countries are mobilizing finance to develop low-carbon technologies. These financial flows need substantial scale up to meet the actions required. Actions on climate change will create business opportunities. Averting climate and promoting growth and development are not mutually exclusive choices.
(iv) A range of options exist to cut emissions; strong, deliberate policy action is required to motivate their take up. Emissions could be reduced though increased efficiency, changes in demand and technological change. Even with very strong expansion of renewable energy sources, fossil fuels could still make up half of global energy supply in 2050. Climate change is the greatest market failure the world has ever seen, and it interacts with other market imperfections. Three elements of policy are required for an effective global response: the pricing of carbon; innovation and deployment of low-carbon technologies; and elimination of barriers to energy efficiency, including the education of individuals.
(v) Climate change demands an international response, based on a shared understanding of long-term goals and agreement on frameworks for action. Though the Kyoto Protocol provides a basis for international cooperation, more ambitious action is required around the world. Action by individual countries is not enough. It is essential to create a shared vision of long-term goals and to build the international frameworks that will help each country to play its part in meeting these common goals.

The Report identifies key elements of future international frameworks that LAC countries need to assess so as to find the best lines of action in climate change: technology cooperation; emissions trading; actions to reduce deforestation; and adaptation.

The Infrastructure and Financial Markets Division of the Sustainable Development Department provides technical and advisory support, research and dissemination within the IDB group. This mission is accomplished through the development of policies and strategies, training programs, and dissemination of best practices.

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