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Dealing with Public Risk in Private Infrastructure

Edited by
Timothy Irwin
Michael Klein
Guillermo E. Perry
Mateen Thobani

WORLD BANK LATIN AMERICAN
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DEALING WITH PUBLIC RISK IN PRIVATE INFRASTRUCTURE

Edited by
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Preface

This volume reports on the findings of a conference aimed at advising policymakers from Latin America and the Caribbean (LAC) on how to manage government exposure to private infrastructure projects. The conference was held in Cartagena, Colombia in May 1997. It was conceived by Guillermo E. Perry, Chief Economist of the Bank's Latin American and Caribbean Region, who also provided overall guidance on the project. In his previous capacity as Finance Minister for Colombia, Mr. Perry found that there was little practical guidance available on whether governments should assume risks in private infrastructure projects; on ways to reduce the risks; on how these risks should be allocated among taxpayers, consumers, and investors; and on how the government should value and budget for any risks it assumes.

Michael Klein, then Manager of the Private Participation in Infrastructure Group, and Mateen Thobani, Senior Economist in the Latin American and Caribbean Region Chief Economist's Office, were the task managers for the project. Timothy Irwin, Economist in Mr. Klein's Group, helped edit the volume.

The Bank's Economic Development Institute provided major funding for the conference and collaborated in the design and delivery of the seminar. Additional funding came from the Bank's Research Program, from the Colombian Ministry of Finance, which funded the local expenses for the conference, and from fees charged to nongovernment participants. Katharine Brewer played a key role, along with Mateen Thobani and L.K. Arora, in organizing the conference. Ms. Brewer also assisted with all stages of preparation for the volume. R. David Gray read and commented on all the chapters. Barbara Karni copyedited the volume. Cristina Palarca assisted with word processing.

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1
Dealing with Public Risk in Private Infrastructure: An Overview

Timothy Irwin, Michael Klein, Guillermo E. Perry, and Mateen Thobani

ABSTRACT

The current wave of infrastructure privatization is largely a positive development. The transfer of risk to private operators should lead to the development of new infrastructure, improvements in the operation of existing infrastructure, and a reduction in budgetary subsidies. Yet it also raises problems for governments. Infrastructure privatization in the developing world has frequently been accompanied by extensive residual risk-bearing by governments, which threatens to vitiate its efficiency benefits and confront future governments with large financial liabilities. To solve these problems governments need to institute policies that make investment attractive even in the absence of extensive guarantees. With those policies in place developing country governments should be able to restrict their risk-bearing to certain political and regulatory risks over which they have direct control.

When governments do provide guarantees they should attempt to measure the costs of these guarantees and improve the way they treat them in their accounts and budgets. Measurement and budgeting are critical to improving decisions about whether to provide guarantees, to improving project selection and contract design, and to protecting governments from unknowingly entering into commitments that might jeopardize future budgets.

▼ ▼ ▼

Private investment in infrastructure has increased enormously over the past decade. As recently as 1988 foreign private investment in infrastructure amounted to $100 million; in 1996 the figure was $20 billion. The increase is welcomed for several reasons:

- Private firms typically have stronger incentives than government enterprises to build and run infrastructure businesses effectively and at low cost and—if prices reflect costs and the firm's profits depend on consumer demand—to choose good projects and avoid "white elephants."
- Privatization encourages and facilitates the charging of cost-covering tariffs, thus addressing the problem of underpricing that has afflicted many publicly provided infrastructure services.
- Greater efficiency and cost-covering prices together allow investments and services to be provided that might not otherwise have been possible, while simultaneously improving the government's fiscal position by making available the same quantity and quality of service with smaller budgetary subsidies.

Thus there are both microeconomic and macroeconomic benefits of private investment in infrastructure. But such investments subject investors to major risks, since the investments are often large and their costs can be recouped only over long periods of time. Two special features of infrastructure create additional risks. First, the investments are largely sunk; the assets cannot be used elsewhere except at great cost. Second, infrastructure projects often provide services that are considered essential and are provided by monopolists. As a result services are highly politicized. As many of the chapters in this volume emphasize, this combination of factors makes investors especially vulnerable to opportunistic government actions. Before the investment is made the government has every reason to promise to treat the investor fairly—to allow cost-covering tariffs and to avoid changing regulations in a way that would adversely affect the investor. Once the investment is made, however, the government has an incentive to renege on its promises, since it can satisfy political demands to reduce prices or otherwise appropriate the investor's profits without causing the investor to pack up and leave. Because of these characteristics private investors' returns are uncertain and are more sensitive than in most industries to the host government's behavior.

To protect themselves from these risks private investors often ask the host government to provide extensive guarantees against risks such as those of nonpayment by purchasers, cost overruns, or low demand. In other words, they ask the government to enter into some form of arrangement that results in the government's—and not their—net wealth varying with the risky outcome. Anxious to encourage investment, governments often consent.

Poorly designed guarantees threaten, however, to undermine the benefits of privatization. First, they can blunt the private investors' incentives to choose only good projects and to run them efficiently. If the government bears the risk of the project's failing, the private investor is willing to invest in projects that are likely to fail; having invested in a project, the private investor has little interest in maximizing its chance of success. Second, guarantees may impose excessive costs on the host country's taxpayers or consumers and expose them to too much risk. Since guarantees rarely show up in the government's accounts or budgets, governments may not know what their exposure is. Moreover, a severe recession or economic crisis could trigger many guarantees simultaneously; many of the government's contingent liabilities might thus become actual and current all at once. The problem may not be immediate, but as government's infrastructure-related risk exposure grows the chances of trouble arising will also increase.

Governments just embarking on the transition to a more market-oriented economy may find they face political constraints that prevent them from introducing all the policies that would permit privatization without large-scale risk-bearing. Until they can raise prices to cost-covering levels, for example—or raise taxes to provide explicit subsidies—they may have to bear certain risks. Compared with the alternative of continued public ownership, privatization with significant risk-bearing may be desirable. Yet, as this volume argues, governments that introduce good policies can attract private investment without themselves bearing commercial or macroeconomic risks. When they do assume risk, they need to identify it and, where feasible, measure and budget for its expected cost.

The rest of this chapter introduces the papers that follow. It first describes how private investment in infrastructure (construed broadly to include telecom-

munications, power, gas, water, and transport) has grown and what sorts of risks governments have retained in private projects. It then considers how governments can reform policy to make infrastructure projects more attractive to private investors and thus reduce or eliminate the amount of risk governments have to assume. Finally, it shows how governments should decide whether or not to bear risks and how they should measure, budget for, and account for the costs and risks they do assume.

The Growth of Private Investment and Government Guarantees

The Growth of Private Investment

As Dailami and Klein note in chapter 2, long-term flows of private capital (for all sectors, not just infrastructure) have grown rapidly in recent years. From 1990 to 1996 the net flow of private funds rose from $44 to $244 billion a year. During the same period, public flows fell—from $56 to $41 billion.

The recipients, as well as the providers, of capital are now predominantly private. With growing privatization the annual flow of resources received by the private sector in developing countries rose from $38 billion in 1990 to $200 billion in 1996. Public receipts rose only from $63 billion to $85 billion over the same period.

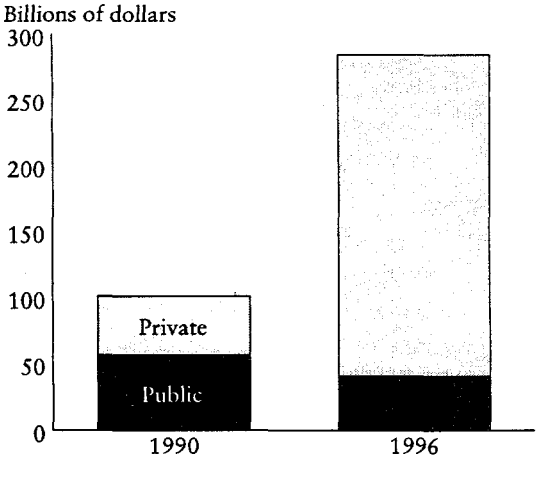
Private cross-border finance for infrastructure projects has exploded as well, rising from $0.1 billion in 1988 to $20.3 billion in 1996. By now, more than 100 governments have involved the private sector in infrastructure provision.

Despite this tremendous growth private investment still accounts for only about 15 percent of total investment in infrastructure. Given the continuing disenchantment with the performance of government-provided infrastructure in much of the developing world and the continuing desire of most governments to reduce cash expenditures, the demand for private finance will likely continue to grow. On the supply side, investors also have an interest in private infrastructure, because of the opportunities it affords in terms of returns and diversification (see World Bank 1997c). Thus although a continuation of the trend toward private investment is not inevitable—large-scale macroeconomic problems or a new wave of expropriation and nationalization could both deter investors—it appears likely.

The Growth and Nature of Government Guarantees

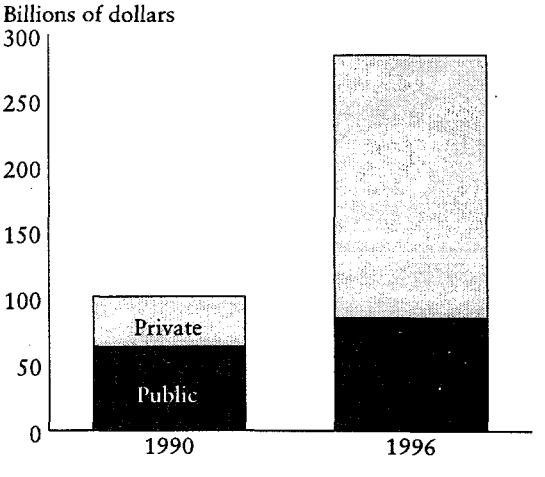
Investors in private infrastructure have usually not been willing to bear the risks of these projects alone,

FIGURE 1.1
Sources of net long-term resource flows to developing countries



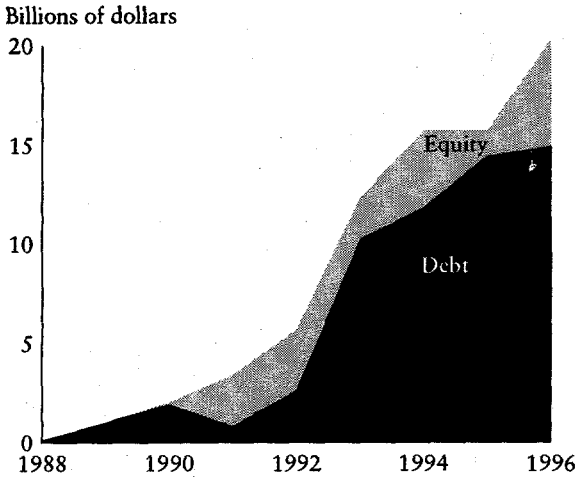
Source: World Bank 1997a.

FIGURE 1.2
Recipients of net long-term resource flows to developing countries



Source: World Bank 1997a.

FIGURE 1.3
Private cross-border infrastructure finance



Source: World Bank 1997a.

and have demanded that government assume some of the risk (on the definition of "risk," see box 1.1). Although the magnitude of the risk borne by governments is not known, anecdotal evidence from many projects suggests that government risk-bearing in privately financed projects has grown commensurately with private infrastructure. Governments share various types of risk, including demand risk, payment risk, exchange and interest rate risk, and political and regulatory risk. They also bear implicit risks.

Demand risk. In privatizing toll roads the host government has often committed itself to ensuring that the private owner receives at least a minimum level of revenue when demand is lower than expected, thus shifting some of the risk of variation in demand to the government. In the El Cortijo–El Vino toll road project in Colombia, for example, discussed in chapter 6, the government undertook to reimburse the concessionaire if traffic was less than 90 percent of the specified level, agreeing to pay the concessionaire an amount equal to the toll times the difference between 90 percent of the estimated number of vehicles and the actual number of vehicles.

Governments bear similar risks in other sectors. The Colombian government, for instance, provided a minimum-revenue guarantee when it awarded a build–operate–transfer concession for a new runway at Bogotá's El Dorado airport in 1995 (Juan 1996). And many governments, through their utilities, have agreed to pay independent power producers a fixed amount each year that is independent of the actual level of power subsequently demanded from them. These volume or revenue risks are the focus of chapter 4.

Payment risk. An agreement by a state-owned utility to pay an independent power producer irrespective of demand protects the investor from the risk of falling demand for power or of new and cheaper generators coming on stream in the future. But it does not protect the investor from the risk of the utility defaulting on its obligations. To protect themselves against this risk, investors usually ask the government,

BOX 1.1
Defining "risk"

In finance theory and the applied fields of securities analysis and portfolio management, "risk" is often used to refer to the volatility of returns around an average or expected return. In this sense, risk is equivalent to the statistical concept of variance, and a project's risk can increase without any change in the expected (or mean) return on the project. Investors who were risk neutral (in the sense used in economics and finance) would be indifferent to risk in this sense, and risk of this sort can be effectively eliminated by diversification if it is not systematic.

In project finance, on the other hand, "risk" frequently refers to the ways in which actual results may be worse than planned. Here the benchmark is not the expected return of the project but the (generally higher) return that investors would receive if everything went according to plan. Thus, for example, investors estimate the returns they will earn on the assumption that the government does not expropriate their investment but note a risk of expropriation. An increase in expropriation risk in this sense does not just increase the volatility of returns, it reduces the expected return. Even risk-neutral investors would prefer to avoid these "risks." Diversification cannot eliminate this risk; it can only spread the loss among many people.

In this chapter the term "risk" is used in the sense of variance—or volatility around a statistically expected outcome. Expropriation risk, for example, is thus the volatility in returns around an expected return attributable to uncertainty over whether the government will expropriate.

which is more creditworthy than the utility it owns, to guarantee the utility's payments (on the definition of "guarantee," see box 1.2).

Exchange and interest rate risk. Governments have sometimes borne the risks associated with adverse fluctuations in exchange and interest rates. The Spanish government, for example, had many private toll roads built during the 1960s and early 1970s and bore exchange rate risk on foreign loans that financed the roads. Gómez-Ibáñez and Meyer (1993) describe the guarantees given and their rationale as follows:

> The Spanish government had required the early concessions to finance a large part of their costs from foreign debt in order to ease Spain's balance-of-payments problems and to avoid drawing away domestic savings from other projects. The 1972 law [on toll road concessions] set standards that at least 45 percent of construction costs be financed from foreign loans, at least 10 percent from equity, and no more than 45 percent from domestic loans. The early Spanish [highway] companies had trouble raising funds from foreign capital markets, however, and in return the government agreed to guarantee some of these loans and to protect the companies from exchange rate fluctuations. The 1972 law specified that the government would guarantee up to 75 percent of the foreign loans; moreover, all foreign loans would be denominated in pesetas with the government assuming the full exchange rate risk (p. 126).

That is, if the peseta depreciated relative to the foreign currencies in which the loans were made, the concessionaire's loan repayments would remain the same but the Spanish government would make an additional payment to ensure that the foreign lenders received no less foreign currency. In the end the Spanish taxpayer spent about $2.7 billion as a result of the guarantees (see chapter 2).

Political and regulatory risk. Governments often bear certain political and regulatory risks, even when they bear none of the risks mentioned above. In the Melbourne City Link, a private toll road in Australia, private-sector parties bear most of the risks discussed above, but the state government bears several risks that are tied to actions taken, or influenced, by the government. If, for example, the government subsequently bans toll roads or takes actions that deliberately reduce the profitability of the private investor, the government will compensate the investor. The government also bears risk associated with possible court findings that aboriginal land rights have been violated and with strikes on the construction site that are undertaken as a protest against the state government rather than as part of site-specific disputes.

Under the government of Pakistan's policy framework for private power generation, to take a second example, the government agreed to "cover certain political and governmental force majeure risks, provide protection against changes in certain taxes/duties, and ensure foreign exchange convertibility for the projects." (International Finance Corporation 1996, p. 49).

Implicit risk-bearing. Government risk-bearing need not be made explicit in contracts or laws. Sometimes everyone concerned expects that the government will in fact bail out a company if it would otherwise fail. The case of private Mexican toll roads may provide such an example. They were partly financed by commercial banks, which were owned at

BOX 1.2
Defining "guarantee"

As Smith points out in chapter 3, the term "guarantee" is used in different ways. In Smith's strict use of the term, one party can guarantee another party's behavior, but it cannot guarantee its own. Thus, for example, the government can guarantee the payment performance of a legally separate business it owns, but it cannot guarantee its own permission to convert currency. Only a third party, such as a multilateral development bank, can do that.

The term "guarantee" is also used more broadly to mean simply a commitment to bear a risk. When a government gives an exchange rate guarantee, in this sense, it is just agreeing to assume exchange rate risk. In this chapter the term is used in the broad sense to mean the assumption of a risk. As with "risk," it is important to be clear about how "guarantee" is being used in a given context, since the implications of giving a guarantee depend on which type of guarantee it is.

the time by the government and which, it has been argued, exercised less care than they should have in assessing the credit risks they were assuming. Although the Mexican government did not explicitly agree to bear the credit risks taken on by the banks, it did in the end bail them out when, partly as a result of the poor financial performance of the private toll roads, they got into trouble. Some argue that the bailout had been expected by the banks and that this expectation had an effect similar to that of an explicit government guarantee.

Other forms of risk-bearing. Governments bear risk in other, less obvious ways as well. They may lend directly to projects and bear repayment and perhaps interest rate risk. They may become part owners of a project and thereby bear a proportion of the overall risk of the project. Moreover, as Mas points out in chapter 5, governments own a share of many firms, in an economic if not a legal sense, through the corporate tax system: if profits are high, the government gets more corporate income tax; if they are low, it gets less.

Policies That Reduce Risk

Governments issue guarantees in order to make projects attractive to investors, often using risk-bearing as a way of compensating for shortcomings in the government's present, and expected future, policies. But as the authors in this volume show, the assumption of risk by government creates its own problems—not for investors but for the government and its citizens, who are subject to usually hidden costs and unknown risks. The first, and most desirable, thing governments can do to make projects more attractive is therefore to put in place good policies that reduce risks and raise expected returns. Governments that have established good policies and have persuaded investors that they will maintain them can attract private investment without extensive risk-bearing.

Private investment in infrastructure without much government risk-bearing is common in many OECD countries. In the United Kingdom, for example, the government attracts large amounts of private investment despite its policy of not bearing even regulatory risks except where they relate specifically to a project (United Kingdom 1995). When developing countries have introduced good policies and maintained them for a few years, they have also been successful in attracting private infrastructure capital without guarantees. In Chile private firms have invested in telecommunications, power, and gas without government guarantees (see the commentary by Jadresic following chapter 2). In Colombia investors have "gradually dropped requirements for guarantees of the performance of government purchasers" (Klein 1996a). In Argentina the complete restructuring and privatization of the power industry permitted the government to attract private investment without having to assume major risks or issue guarantees (Klein 1996a).

Policy reform in four areas—macroeconomic policy, regulatory policy, information disclosure, and capital market liberalization—can help attract private investment that does not depend on government guarantees. (For more on these issues see also Asian Development Bank 1997a and 1997b).

Pursuing Stable Macroeconomic Policy

As Mas notes in chapter 5, a stable macroeconomic environment does a great deal to reduce risks for private investors. The government can make a large contribution to creating and maintaining a stable environment by maintaining stable prices and a balanced budget. It can also take actions to increase the likelihood that it will continue to act prudently in the future. For example, it can issue inflation-indexed local currency debt to reduce the temptation to reduce the real level of the debt by inflating. When good macroeconomic policies are in place, the likelihood of large changes in the exchange rate and interest rates are reduced, though not eliminated, and the pressures on governments to prevent convertibility and transferability are lessened. Demand becomes easier to forecast as well.

Over time governments in developing countries such as Chile and Colombia have developed reputations for pursuing reasonably stable macroeconomic policies and have received investment-grade credit rat-

ings. The governments of certain rich countries, such as those of Singapore and Switzerland, have even stronger reputations.

Designing Good Regulatory Policy and Appropriate Contracts

In regulatory policy, as in macroeconomic policy, one of the government's major challenges is to develop a reputation for treating firms reasonably—a challenge that is easy to state but hard to meet. As Smith shows in chapter 3, however, there are several steps that governments can take to reduce regulatory risks before they have had a chance to build reputation.

Perhaps the most important measure is to expose the infrastructure service to competition whenever possible. Competition encourages better performance by firms and enables the government to let private firms make decisions about which investments to undertake. Moreover it reduces the political pressure on governments to intervene in markets. When firms have monopolies consumers will look to the government to keep prices down, and the government will come under pressure to keep prices below costs. When a firm operates in a competitive market, little or no economic regulation is necessary and consumers will look to the firm's competitors to keep prices down. As Mas notes, the government will also be better able to resist the pressure to bail out firms that have failed in competitive markets—that is to avoid giving implicit guarantees of commercial risk.

In some instances monopolies may be unavoidable. In such instances governments can still reduce risk, mainly by establishing laws and regulations that protect property rights and by enforcing them in a fair and consistent manner. Specific economywide options cited by Smith include the following:

- Establishing expert regulatory agencies that have some independence from the rest of the government and are thus partially insulated from popular pressure to keep prices below costs
- Reforming the constitution to impose limits on the power of the executive to act arbitrarily
- Strengthening the independence and quality of the judicial system, so that it can act as a restraint on the executive
- Signing international treaties (that bind the government to permit convertibility and transferability, for example)
- Agreeing to be bound by international arbitration.

The design of concession contracts—themselves a form of regulation—can also reduce risks when competition is not feasible, as Engel, Fischer, and Galetovic show in chapter 4. Changes in contract design resulting from the measurement of risk under alternative project designs can reduce project risks, as Lewis and Mody show using the example of a toll road in Colombia (chapter 6).

Publicly Disclosing Relevant Information

The government can also reduce risk by publicly disclosing relevant information. In the macroeconomic domain Mas notes that the government can improve private investors' ability to forecast the future, and thus reduce the perceived riskiness of projects, by making relevant information publicly available. Indeed, one of the actions taken by the Mexican government in the wake of the 1994 crisis was to publish quarterly macroeconomic updates that are available on the Internet.[1] The government can publish frequent and regular accounts showing the development of its financial position. It can compare outcomes with forecasts and regularly update the forecasts. Those statements can, moreover, include the sorts of information on guarantee exposure discussed below. The monetary authorities can explain publicly their model of the macroeconomy and routinely discuss their policy intentions. The statistics department can collect and quickly publish data on macroeconomic outcomes. The regulatory authorities can clearly and comprehensively explain the regulatory framework before private investors have to commit themselves.

Liberalizing Capital Markets

The government can help others manage risk at lower cost by liberalizing financial markets. In the local market it can remove barriers to entry by new firms and remove restrictions on the services that firms can offer. It can also give local citizens and firms full access to international capital markets and the diversification

and hedging instruments they provide—while ensuring that banking supervision, exchange rate, and other policies are consistent with the liberalization.

The most direct advantage of capital market liberalization is that it permits improvements in the allocation of risks. Free local capital markets allow risks to be redistributed within the country to those people that can bear them at least cost. The removal of barriers to international financial markets permits further diversification and redistribution. Permitting local citizens to invest in foreign countries and in foreign currencies, for example, lets them diversify their portfolio internationally and thus reduce their exposure to the health of the local economy. As Mas notes, removing capital controls also gives the government quick feedback on its performance, since bad policies can quickly cause increases in interest rates.

Principles of Risk Allocation

How should governments decide whether to bear risks in a private infrastructure project? If they do decide to bear risk, which risks should they take on?

Infrastructure project risk can be allocated, at a broad level, to government, firms, or consumers. These agents can in turn redistribute risks to others. Firms, for instance, choose how to allocate risks among lenders, shareholders, and insurers. Risks allocated to the governments are ultimately borne by the country's taxpayers.

Two critical factors determine whether an agent should bear risk: the degree to which the agent can influence or control the outcome that is risky and the agent's ability to bear the risk (that is, its cost of risk-bearing). Other things equal, risks should be allocated to agents who can best control the risky outcome and to agents who can bear the risk at the lowest cost (because they are the least risk-averse, because they can most easily insure or hedge against the risk, or because they can spread the risk among many people).

These two factors often push in different directions—the group or organization that has most control over the risky outcome may not be in the best position to bear the risk. In this case the various costs and benefits must be weighed against each other. The transactions costs of any allocation must also be considered. An allocation assigning each of a project's many risks according to each party's control over the outcome and its costs of risk bearing may require detailed analyses, tough negotiations, complex legal contracts, expensive monitoring arrangements, and possibly the high costs of settling disputes in court. The optimal allocation of risk takes these costs into account.

Control over Risky Outcomes

Some risky outcomes are more easily controlled by private firms, others by the government, as illustrated by the examples below.

Consider the demand risk in a telecommunications concession—that is, the fact that demand may be higher or lower than the best forecast. Since the firm can increase demand by keeping quality high—preventing faults, fixing them quickly when they do occur, improving sound quality, introducing new services, and so on—quality may be higher if the firm bears demand risk (that is, if the firms' profits vary with demand).[2] Other things being equal, then, demand risk in a telecommunications concession should be allocated to the firm. (Note that the same line of reasoning may not give the same results in all sectors; see the discussion of demand risks in toll roads below.)

To take a second example the government alone controls whether local currency can be converted into foreign currency (convertibility risk) and whether foreign currency can be transferred out of the country (transferability risk). Convertibility and transferability risks can therefore be reduced by allocating them to the government. Note, however, that governments do not have the same control over the exchange rate itself, so there is no comparably strong argument for their bearing exchange rate risk.

Government's responsiveness to financial incentives. Allocating risks to the government will improve outcomes only if the government responds to financial incentives. Since government decisionmakers often do not act in the interests of their citizens, governments are generally less responsive than firms to financial incentives. Allocating government-controlled risks to

the government may thus do less good than allocating firm-controlled risks to firms. When the financial consequences of the government's risk-bearing do not show up in its budgets or accounts, government may be less responsive still. If, for instance, the likelihood of the government's permitting convertibility and transferability is unaffected by any obligation to pay compensation in case of malfeasance, there is no value in allocating these risks to government. A similar point applies to the cost of risk-bearing discussed below: since political decisionmakers face weak incentives to lower costs (and have poor information about the government's exposure to risk) governments may be less adept than private investors at taking advantage of opportunities to reduce risk, through diversification or hedging for example.

The Costs of Bearing Risk

Governments versus private firms. In general, the public and private sectors appear to have similar costs of risk-bearing. Because governments can spread risks among all their taxpayers, the governments of large countries with broad tax bases may have a relatively low cost of bearing risks—especially the risks entailed by small projects. Such governments may have a lower cost of risk-bearing than some private firms. Consider again the telecommunications concession mentioned above, and suppose the concession was owned by a single risk-averse entrepreneur. The cost of bearing the demand risk would probably be higher for a single risk-averse entrepreneur than for the government and its taxpayers, and that cost would have to be passed on to consumers. In this simplified example the choice of allocating the risk to the government or the entrepreneur would depend on a comparison between the incentive benefits associated with allocating demand risk to the entrepreneur and the lower cost of risk-bearing associated with allocating it to the government.

This example is simplistic, however. Governments do not always have a lower cost of risk-bearing than private investors, and the relative costs of risk-bearing do not in general justify allocating risks to governments. The private sector is at least as capable as governments of spreading risks, and large companies can have thousands, even millions of shareholders, most of whom invest only a small fraction of their wealth in the company. As a result, the private sector can probably bear risk as cheaply as governments.[3]

Customers versus investors and locals versus foreigners. Risk-bearing costs should also inform decisions about the allocation of risks between customers and investors and between locals and foreigners. Consider, for example, a case in which consumers bear demand risk, something that happens under revenue-cap price regulation. Under a revenue cap, prices are set in order to give the firm a certain level of revenue but no more. If demand rises, the regulated maximum price falls; if demand declines, the regulated maximum price increases. This form of regulation may create high risk-bearing costs, since the value of local consumers' assets, and the income they get from the assets, may be closely correlated with the demand for the regulated service. Policies that require the government to bear demand risk are also likely to have similar consequences, since the government will suffer the consequences of low demand just when its tax revenues have fallen and expenditure on nondiscretionary welfare spending has risen.[4]

Foreign investors, on the other hand, may be well placed to assume the risk, since they probably hold a portfolio of assets whose value is little correlated with local business conditions. Notice that what ultimately matters is not the portfolio of projects owned by the foreign companies that are involved in the project; their business may be concentrated in one sector in just a few countries. Rather it is the portfolios of the ultimate investors—the individual shareholders or, in the case of public foreign investment, the taxpayers—that determine the costs of risk bearing.

The Tradeoff between Risk Allocation Criteria

As mentioned above, the benefits of allocating risks to those who can best control the risky outcome must sometimes be weighed against the benefits of allocating them to those who can bear them at least at cost. Spreading a risk among a large number of shareholders or taxpayers may lower the costs of risk-bearing, but allocating a risk to a small number of agents who have control over the risk may help ensure the success

of the project. Rather than diversifying risks completely, then, it usually pays to give managers and strategic investors significant stakes in the project.

Private investors can better make this tradeoff than can governments. First, they can more easily choose between the benefits of spreading risks evenly among many shareholders and the incentive sharpening achieved by giving certain investors and managers large stakes in the project. Governments pass on risks to all their taxpayers, which tends to lead to an outcome at the risk-reducing extreme of the spectrum. Private investors could choose such an extreme, but they may prefer to sacrifice some diversification for the sake of maintaining strong incentives to perform well. Second, private investors have stronger incentives to choose the optimal combination of risk-spreading and incentive-sharpening (Klein 1996b).

Policy Transitions

Compared against the criteria for risk allocation discussed here, many governments in the developing world appear to bear too much risk when they privatize infrastructure. Their policies may nevertheless represent improvements over those of the past. Under traditional public ownership the government bears all the commercial risk: privatization almost always transfers some risk to the private sector. When the government guarantees a private toll road sponsor 90 percent of expected toll revenue, for example, it bears less risk that it would if it owned the road and bore 100 percent of the risk. Privatizing the road and providing guarantees to the concessionaire may thus be better than having the government build and operate it without private participation—or not building the road at all.

Governments in developing countries moving toward more market-oriented policies may find themselves unable to introduce all the reforms that would be required for privatization without government guarantees of commercial risks. They may, for example, find it impossible politically to raise prices to cover the risk-adjusted cost of capital or to raise taxes to pay direct instead of contingent subsidies to investors. Moreover, the government's understanding of what constitutes the optimal policy framework will evolve over time; the government may not be able to implement the ideal policies immediately even if it faces no political constraints. Such a government has a choice between privatization with significant government risk-bearing and continued public ownership. Faced with that choice it may justifiably prefer the second-best option of privatization without the full transfer of commercial risks to private investors.

Governments that have just embarked on a transition will also suffer from a lack of reputation, even if they succeed in implementing good policies. Even if their laws and regulations are as good on paper as those of, say, the United States, investors will be considerably more wary about investing there. Governments in countries in transition may have to provide explicit undertakings—to allow convertibility or to compensate in case of expropriation, for example—where industrial country governments do not. In countries such as the United States, investors may think it unnecessary to seek certain explicit project-specific guarantees, either because the risks are negligible or because they are confident that they will be protected by the legal system and the courts in case of problems. In countries that have reformed their policies only recently, investors may want the government to assume these risks explicitly in a contract.

Investors may also doubt that the newly reformed government will maintain its good policies. If the government does intend to do so, an argument can be made in favor of allocating some project risk to the government (in addition to those political and regulatory risks that are directly under its control). Caution is warranted, however, since governments may misjudge the future course of their own, or their successors', policies. The best response may be to try to convince investors that they are too pessimistic by providing them with all the information on which the government bases its more optimistic assessment.

Some Guidelines for the Allocation of Certain Infrastructure Risks

The principles of risk allocation outlined here can be applied to the risks that governments are often asked to bear in infrastructure privatizations. In this sec-

tion, we consider the classes of risk that are the subject of three of the following chapters: political and regulatory risks (chapter 3), demand and cost risks (chapter 4), and exchange and interest rate risks (chapter 5).

Political and Regulatory Risks

In chapter 3 Smith distinguishes three types of risks:

- Traditional political risks, which include the risks of expropriation, political violence, currency inconvertibility, and currency nontransferability
- Regulatory risks, which relate to the application and enforcement of regulatory rules (expressed in laws, regulations, or contracts) at either the economywide or the project-specific level
- Quasi-commercial risks, which pertain to the risks of contractual nonperformance by government agencies in their capacity as suppliers to or purchasers from the private infrastructure project.

Traditional political risks. Smith accepts that traditional political risks should be borne by the government. The risks of expropriation, currency inconvertibility, and currency nontransferability are directly under the control of the government, and there is good reason to encourage the government not to create losses associated with any of these three risks. The main issue is how the government can credibly commit itself to bearing the risk—that is, to commit itself not to create the conditions that would lead to the loss or to fully compensate investors if it does.

The case for government bearing the risks of political violence is more subtle, since the government has less than complete control over it. Smith notes that international law generally requires governments to exercise only due care and does not hold them strictly liable for losses. Governments are thus required to compensate investors only if they fail to take reasonable steps to prevent the violence.

Regulatory risks. Regulatory risks pose trickier questions. Should the government commit itself not to change the laws and regulations affecting the investment project or to compensate in case it does? On the one hand, these risks are clearly under the government's control. On the other, it is sometimes desirable for the government to change laws in ways that adversely affect investment projects. It may be beneficial to increase taxes to fund new and socially valuable public expenditure, for example, or to impose regulations to mitigate newly recognized environmental problems. In many cases, such as that of new environmental regulation, the government can bear the risk and still change policy—it just needs to compensate firms for the policy change. In other cases, however, compensation cannot be reconciled with flexibility. If governments had to compensate everyone for imposing higher taxes, for example, they could never increase their (net) revenue.

The same issue arises when considering project-specific regulations, such as rules setting the maximum prices the infrastructure investor can charge for services. Contractual commitments by the government to apply specified price-control rules shift risk to the government, but they make it harder to adapt the rules to changing circumstances; general principles that require considerable discretion to implement create flexibility but fail to shift much risk to the government. Smith leaves open the question of exactly which regulatory risks governments should bear, arguing for a case-by-case approach and noting that countries with better reputations for treating investors reasonably can adopt more flexible rules.

Quasi-commercial risks. Quasi-commercial risks arise when an investor contracts with public suppliers or purchasers that may renege on contractual commitments, often as a result of political pressure. When the public agency is a state-owned company with a legal identity different from the government's, it may well be less creditworthy than the government itself, and private investors will want the government to bear the risks of subsidiary's nonperformance. The degree to which nonperformance by the government agency is a political risk depends on the agency's degree of autonomy from the government; it is government involvement in the operation of the agency that makes the risk quasi-commercial rather than an ordinary commercial contracting risk. If the agency has little autonomy, government guarantees may be desirable. But

increasing the agency's autonomy by privatizing it is, Smith notes, a preferable solution.

Demand and Construction Cost Risks

In chapter 4 Engel, Fischer, and Galetovic discuss two risks governments are often asked to bear, especially in toll road, bridge, or tunnel projects: the risks that profits will be higher or lower than their expected value as a result of variability in demand or construction costs around their expected values. Both risks tend to be critical. Construction costs can be very high, and must be incurred upfront. Demand over the useful life of a toll road is inherently difficult to predict, especially when there is no historical data to facilitate forecasts. In chapter 6 Lewis and Mody note that demand and construction risks were the two most important for the government in the El Cortijo–El Vino toll road in Columbia.

Although the pressure for demand and construction-cost guarantees may be strong, the rationale for them in terms of the framework set out above is weak. The concessionaire usually has considerably more control than the government over construction costs, even if it cannot control them completely. Moreover, if the concessionaire bears the construction risk, the incentives to avoid white elephants are stronger. Accordingly Engel, Fischer, and Galetovic conclude that construction risk should not be borne by the government.

Demand risks are more problematic. The government can influence some of the factors that affect demand. The quality of the government's policies will affect average incomes and therefore demand, for example, as will its decisions about whether to build other roads. Some roads would compete with the private toll road, thus lowering demand, while others would act as feeder roads, increasing demand for the private road. But the government is only one of many influences, and government guarantees of demand create incentive problems. If investors are shielded from demand risk, they have less reason to screen projects carefully with a view to investing only in those in which expected demand is sufficient to justify the project. At the same time, however, the toll road operator may have little control over the demand risk either. As long as certain minimum standards are met traffic on some roads or bridges may vary little with increases in quality; if so, there is less to be gained by allocating demand risk to the road owner.

Engel, Fisher, and Galetovic observe that by changing the way they regulate the infrastructure service governments can reduce the demand risk faced by concessionaires and thereby reduce the concessionaires' demand for guarantees. The most common form of regulation of infrastructure such as roads, tunnels, bridges—and many other services, as well—involves auctioning the right to operate the service for a fixed period of time. The authors note that there is an alternative to a fixed term, which is to allow the term of the operating concession to vary with demand. If demand is higher than expected, the concession will be shorter; if demand is lower, the concession will be longer. The method, which has been used in the United Kingdom for bridges, reduces the variance of the investors' profits: compared with the fixed-term concession, profits are lower when demand is strong but higher when demand is weak.

Engel, Fisher, and Galetovic propose an ingenious auction that differs from that used in the United Kingdom. Under their scheme the concession is awarded to the bidder seeking the lowest present value of revenue, calculated with a discount rate specified by the government in advance. The concession ends when the concessionaire's revenue reaches the present value it had sought. The concessionaire still bears some demand risk—if demand is too low, revenue may never reach the target value—but it bears much less. Moreover, the investor still has an incentive to select only those projects that are likely to be financially attractive without government subsidies.

Exchange and Interest Rate Risks

Exchange and interest rate risks are sometimes among the most important risks facing private infrastructure investors. If large infrastructure investments are funded by floating-rate loans or a series of short-term fixed-rate loans, the projects' profits will be highly sensitive to changes in the interest rates. Projects often also involve considerable foreign financing. If project revenues are in local currency but the investors want

to earn foreign-currency profits, foreign investors will suffer if the local currency depreciates. Ensuring that the right parties bear interest rate and exchange rate risk is thus important to the success of the project. In chapter 5 Mas addresses the question of whether it might be appropriate for the government to accede to requests to take on these risks.

The key argument in support of government bearing these risks stems from an incentive effect. Private investors have almost no control over the exchange rate or prevailing interest rates, both of which are affected by government actions. Macroeconomic policies that lead to price stability and balanced budgets will tend, for example, to reduce the volatility of the exchange rate and the probability of a large depreciation. If governments bear interest and exchange rate risks they have a financial incentive to adopt macroeconomic policies that tend to prevent depreciation or interest rate increases.

Because of this incentive effect the bearing of interest or exchange rate risks by the government may have a useful signaling effect. Since the risk-bearing will be expensive for governments that plan to adopt imprudent macroeconomic policies, governments that choose to issue guarantees can be assumed to be more likely to act reasonably (at least if the political decisionmakers are concerned about the government's fiscal position). Risk-bearing by the government may thus signal good intentions at the same time as it provides the government with an incentive to carry them out.

Mas argues cogently, however, that guarantees of these macroeconomic outcomes are unlikely to have net benefits, except perhaps during the early stages of policy reforms. The incentive and signaling benefits of exchange rate and interest rate guarantees are likely to be limited and could create significant costs, for several reasons. First, it is difficult to separate the effects on project profitability of exchange or interest rates and business decisions. Exchange rate depreciations, for example, will have a direct, easily measurable effect on interest payments on foreign loans measured in terms of local-currency project revenues. But they may also affect the cost of other inputs and demand for the service. These effects cannot easily be measured. Nor can responsibility for losses resulting from, say, exchange rate depreciations always be easily assigned. Losses from depreciation could be blamed on the government, which allowed the exchange rate to fall, or the firm, which left itself exposed by borrowing in foreign currencies.

Second, in flexible exchange rate regimes, exchange rate guarantees may have undesirable as well as desirable incentive effects on the government, since they discourage governments from allowing their currencies to depreciate in the wake of a terms of trade shock, for instance. In this case, government exchange rate guarantees would not necessarily encourage (or signal) good macroeconomic policy. The problem is that interest rate and exchange rate guarantees fail to isolate that which is under government control (macroeconomic policy) from that which is not (the terms of trade, for example).

Mas also notes problems related to the cost of risk-bearing, noting that governments and the taxpayers who back them may already be exposed to the risks associated with interest rate and exchange rate shocks. An adverse terms of trade shock, for example, might lead to both a depreciation and a decline in local incomes, forcing the government to compensate investors just when its tax base had shrunk. Foreign investors would not face this problem and, contrary to a common recommendation, may be in the best position to bear the risk.

Measuring and Budgeting for Risk

Whichever risks a government does take on, it needs to consider how it can measure them and incorporate them in its accounts and budgets. Without good measurement and the incorporation of those measurements in accounting and budgeting, governments will have difficulty making good decisions about whether to assume risks. Moreover, they may court financial disaster.

Instances in which public and private institutions have lost money partly because management was not carefully monitoring the institutions' exposure to risk are not hard to find. Many of the private savings and loans institutions in the United States first ran into trouble because they had made long-term loans at fixed interest rates that they had funded with short-term borrowings. When tight monetary policy caused market interest rates to rise steeply in the early 1980s, the sav-

ings and loans found their costs had jumped relative to their revenues. The differences in the average maturity of their assets and liabilities subjected them, that is, to interest rate risk. Better reporting of risk exposures might have encouraged the institutions to take a less risky approach. At the same time better monitoring and reporting by the U.S. government might have protected taxpayers from the losses they subsequently incurred when the government bailed out many of the savings and loans. The Latin American debt crisis of the early 1980s and the Mexican crisis of 1994 might also have been less severe had the governments involved had access to, and published, data on their financial positions and their vulnerability to interest rate, exchange rate, and other shocks.

In the area of infrastructure, too, prudence suggests that the government attempt to measure and control its exposure. At the simplest level this would require that it know what guarantees it has issued and how much it might lose if the guarantees were called. A government should also estimate what its expected losses are—that is, what it will most probably lose—and what the probabilities are of various greater losses. Where feasible these estimates should be incorporated in the government's accounts and its budgets, so that decisionmakers and those who monitor them (taxpayers, voters, the press, government debt holders) can more easily assess the financial effects of different decisions. Ultimately, a government should have a consolidated picture of its overall exposure to risks, taking into account the correlations between different risks. Once it has such a picture it can consider taking a more active role in managing that exposure through actions such as hedging.

Lewis and Mody's chapter provides a sophisticated overview of the practice of risk management in government. Some basic information is presented here for readers less familiar with the steps governments can take to measure and manage risks.

Identifying and Listing Guarantees

The first and simplest step that governments can take to improve the monitoring and management of risks is to compile and publish a consolidated list of their contingent liabilities and the maximum amounts they stand to lose. The New Zealand government, for example, presents this information in its statement of contingent liabilities, which includes table 1.1.[5]

Calculating Expected Losses

A listing of guarantees and associated maximum possible losses is helpful but has limitations. In particular, it provides no information on the likelihood of losses. It reveals maximum possible losses, that is, but does not indicate what losses the government should expect. Where possible, then, it is useful to quantify not only the maximum possible loss but the likelihood of losses and, therefore, the expected loss.

Sometimes it is simple to estimate expected losses. If the government guarantees a $1 million payment by one of its state-owned enterprises and there is a 10 percent chance of the enterprise defaulting (and a 90 percent chance of full payment), the expected cost to the government of the guarantee is $100,000. In more realistic cases, the calculation of the expected cost is more difficult. There may be more than two relevant possibilities, and the estimation of the probabilities may be extremely difficult.

Nevertheless, as Lewis and Mody show, the calculation of expected losses is sometimes feasible using relatively straightforward techniques. The most tractable cases will be those in which the government has issued a large number of similar guarantees for many years and has recorded information on defaults. In these cases the expected cost of the guarantees can be estimated in the same way as, say, car insurance premiums are calculated. The reforms the U.S. government enacted with the Federal Credit Reform Act of 1990, which Lewis and Mody discuss, are informative.

TABLE 1.1
Statement of contingent liabilities summary table
(millions of New Zealand dollars)

Quantifiable contingent liabilities	*As at 31 May 1996*	*As at 31 May 1997*
Guarantees and indemnities	493	536
Uncalled capital	1,752	2,248
Legal proceedings and disputes	1,317	971
Other contingent liabilities	1,249	1,177
Total quantifiable contingent liabilities	4,811	4,932

Source: Government of New Zealand.

The cost of some unique guarantees can also be estimated simply. Full credit guarantees in which the government guarantees the repayment of a loan to another party can, for example, be valued by looking at the difference between the interest rate charged on guaranteed and nonguaranteed loans. If a firm is paying 15 percent interest on its nonguaranteed debt and 10 percent on loans guaranteed by the government, the annual value of the guarantee is 5 percent of the amount borrowed. (For more on this type of guarantee valuation see Mody and Patro 1995 as well as chapter 6 in this volume.)

The techniques developed in the past twenty-five years to value financial derivatives (such as options, futures, and swaps) can also be used to value guarantees and contingent liabilities, including more complicated ones. Extending a credit guarantee, for example, is equivalent to the government's selling a put option to the lender, which gives the lender the right to put the loan to the government. The valuation of other types of guarantees is much more difficult, requiring the skills of financial specialists, and the feasibility of timely, reliable, and cost-effective valuation has not yet been widely tested. But the possibilities are not merely theoretical: as Lewis and Mody show, guarantees have already been valued using option-pricing techniques in both Colombia and the United States.

Valuing the government's guarantees and other contingent liabilities—and not simply noting maximum exposure—has important advantages. By calculating the expected cost of the government's guarantees, the government and its observers can more easily compare guarantees with cash subsidies. When guarantees are not valued a government may prefer to provide a guarantee instead of a subsidy, even when the guarantee is more costly than the subsidy, because the costs of the guarantee are hidden and may be borne by a future administration. When guarantees are valued, decisions are more likely to be made on the basis of real rather than apparent costs and benefits.

Incorporating Expected Losses in Accounts and Budgets

If expected losses can be reliably calculated, the next step is to incorporate the estimates in the government's accounts and budgets. In the accounts the present value of the expected future costs of guarantees issued in the current year can be recorded as an expense in that year. In the budget the legislature can authorize, alongside the cash expenditures, a certain value of guarantees to be issued, where the value is not the maximum potential loss but the expected cost. (The budget might also limit the maximum possible exposure.) If guarantees are accounted for and budgeted in this way, the government will be even less likely to prefer them to less costly cash subsidies. This is likely to improve the allocation of project risk as well as project selection and contract design. Budgeting for expected losses will also create "fiscal space" in the event that past guarantees are called.

Most governments' budgets and accounts are cash based. The budget authorizes the government to incur certain cash expenditures; the accounts show how much cash the government has received and spent. Noncash items, such as the depreciation of assets during the year and revenues earned but not received in cash (such as taxes owed but not yet paid), do not appear in the budget or the accounts. Such governments do not report their balance sheets or net worth.

While it is possible to note guarantees and other noncash items in what are essentially cash-based budgets and accounts, fully incorporating them requires a switch away from cash-based systems. With standard accrual accounts and budgets, most noncash expenditures show up in the government's budget and in its operating statement, and the government has no fiscal incentive to prefer these noncash expenditures to cash expenditure. But although standard accrual accounting discloses guarantees (as in the table from the New Zealand government's accounts shown above), it records them as expenses only if the loss is considered probable and can be quantified (Afterman 1997). From an economic point of view, the distinction between probable and improbable losses is not always useful; a 10 percent chance of losing $1 million is worse than a 90 percent chance of losing $100,000. More useful is an estimation of the present value of the expected loss arising from the contingent liability. Present-value accounting, as described by Lewis and Mody in chapter 6, therefore attempts systematically to report the expected present value of contracts

entered into. Under a system of present-value budgeting a government has no fiscal incentive to issue guarantees instead of giving subsidies of equivalent value, because both show up as expenditures affecting the deficit and both require appropriation by the legislature.

Although most governments still work with cash-based budgets and accounts, several have either moved, or are in the process of moving, toward the accrual system and a greater emphasis on present values. Iceland and New Zealand have implemented integrated accrual accounts and budgets, while Australia, Canada, Sweden, the United Kingdom, and the United States have taken important steps in that direction. Because of its benefits accrual accounting with more widespread reporting of present values may in the future become the norm in government.

Measuring Risk As Well As Expected Losses

Estimating, reporting, and budgeting for expected losses is important, but expected costs do not tell the government and those that monitor it everything they need to know. Just as guarantees with the same maximum exposure differ significantly if the expected loss differs, so too may guarantees with the same expected but different maximum losses. The whole range of possible outcomes—that is, risk in the sense of volatility—matters. In the terminology of Lewis and Mody, "unexpected" as well as expected losses need to be considered.

Governments should therefore develop systems for summarizing and reporting the major risks—as well as the expected costs—they face. In some cases it is convenient to describe the overall risk with a single number. The approach that has been adopted by many banks is to report the largest loss that can be incurred with a probability greater than, say, 1 percent or 5 percent. The value, known as value at risk, is in essence an application of statistical theory to the description of assets and liabilities. For example, a bank may report that its daily value at risk at the 1-percent level is $10 million, meaning that there is only a 1-percent chance, under normal market conditions, that it will lose more than $10 million in the next day (Jorion 1997). Although banks have been the first organizations to report value at risk, the principles behind such reporting apply to all organizations. Governments should be thinking about how they can apply the principles to their own operations and what useful estimates they might be able to publish.[6]

Taking a Governmentwide Approach to Risk Measurement

Expected losses can be measured individually and then aggregated; the government's total expected loss from issuing several guarantees is simply the sum of the expected losses associated with each guarantee. Risks, however, cannot normally be estimated individually and then summed: the total risk depends also on the relationships between the individual risks.

Because what matters for a government is not the risk relating to any one guarantee but the riskiness of its portfolio of assets and liabilities, value-at-risk reporting is likely to be most useful when done for the government as a whole. Measuring and managing the risks associated with infrastructure privatization therefore requires assessment of the riskiness of all of the government's operations. Exchange rate guarantees, for instance, are likely to be more risky if the government also has net debt denominated in foreign currencies, since a depreciation of the local currency may simultaneously increase debt service payments and trigger payments under the guarantee.[7]

Portfoliowide risk measurement is desirable for another reason as well: only by considering its total portfolio of risks can a government determine which risks are most important. How important are risks associated with infrastructure privatization relative to the risks associated with government debt, pensions, the banking system, and debt owned by city and provincial governments? What proportion of the government's total risk measurement and risk management effort should be devoted to infrastructure? Are the infrastructure guarantees small enough relative to the government's total assets and liabilities, and sufficiently uncorrelated with them, that the government can reasonably consider only their expected costs and ignore the risks they involve? These are critical questions that can be answered only after assessment of the government's overall portfolio.

The creation of consolidated accrual accounts is a step toward portfoliowide risk monitoring. Combined with other information on likely future revenues and expenditures, the balance sheet can provide an indication of the government's vulnerability to exchange rate, interest rate, and other shocks. It can also indicate the relative importance of monitoring and managing infrastructure guarantees on the one hand and debt on the other.

Sophisticated portfoliowide value-at-risk analysis would require more, however, than construction of a consolidated government balance sheet. It would require numerical estimates of the volatility of the values of the assets and liabilities on the balance sheet and the correlations between them and a consideration of the "near" assets and liabilities that do not appear on the balance sheet. The power to tax may be the most significant determinant of the government's financial position; estimates of the value of this "near" asset and its exposure to various risks would need to be estimated. Likewise, future spending programs may not constitute liabilities in an accounting sense when there is no legal obligation to incur the expenditure, but in practice the government's financial health will be sensitive to the variability of expenditure associated with changes in economic variables. Value at risk is thus not something that most governments will be able to report any time soon.

Risk Management

When, and only when, a government has information on the risks to which its total portfolio is exposed, it is in a good position to consider managing its portfolio to reduce those risks. Whether it should, in fact, act to reduce risk—and if so to what extent—is perhaps an open question, analogous to the question of whether firms should attempt to reduce the variance of shareholders' returns or simply maximize those returns (see chapter 5). That citizens, like shareholders, are usually risk averse is not in doubt; the question is whether the government should manage risk on their behalf or simply publicize its risk exposure and permit taxpayers to diversify and hedge their portfolios in ways that give them the risk exposure they want. In practice, citizens often lack sophistication in considering risk. Moreover, because of transaction costs or government restrictions, they may have limited opportunities to hedge against government risk. In that case governmental risk management may be desirable. The aim of such management would be to achieve a level of risk the government finds acceptable, given its citizens' risk preferences, at the lowest possible cost. Options for reducing risk include the following:[8]

- Diversifying the government's financial assets and liabilities (by placing ceilings on the possible guarantee exposure to any one sector, for example)
- Selling assets and paying down debt, thus reducing the leverage of the portfolio
- Setting aside reserves to cover unexpected losses, as well as expected losses
- Hedging with derivatives, such as options, futures, and swaps
- Helping taxpayers diversify their financial assets and liabilities (by removing capital controls that discourage investment in foreign stocks and bonds, for example) so as to reduce the riskiness of the government's tax base.

Conclusion

Whether infrastructure privatization will realize its potential depends on how governments allocate the risks facing the privatized business. Government can increase the benefits of privatization by assuming risks it can control itself (convertibility risk, for example), but it should normally avoid bearing other risks. That way, investors face strong incentives to select projects well and to run those that they do select efficiently. In many infrastructure privatizations, however, governments have assumed risks that would be better borne by investors, both because the investors have been understandably wary of taking on the considerable risks involved and because governments have been able to offer guarantees without incurring any immediate cash costs. A government can thus take two steps to improve the environment for risk allocation. It can reduce the extent of the risks investors face, by pursuing stable macroeconomic policies, disclosing information, implementing good laws and regulations, and liberalizing financial markets. And it can improve the

way it measures, budgets, and accounts for the guarantees it does give, so that the costs and risks are clear at the time the guarantees are issued—not only when the government must subsequently pay up.

Notes

1. See http://www.shcp.gob.mx/english/.

2. Notice that in this case outcomes are better even if the firm's actions to increase quality increase expected demand, and therefore expected profits, without reducing the volatility of demand. Strictly speaking, what matters is control over the risky outcome, not control of the risk per se.

3. Note that the relatively low borrowing costs of governments do not by themselves imply a lower cost of risk-bearing, since they reflect an unremunerated credit guarantee given by taxpayers (Klein 1996b)

4. In principle, both local consumers and the government might reduce their exposure to the fortunes of the local economy in various ways (buying foreign assets, selling short local assets). In practice, governments typically do not do so and sometimes prevent their citizens from doing so by imposing capital controls. Even in wealthy countries with highly developed and open capital markets, however, local investors seem not to take full advantage of the opportunities for international diversification (see French and Poterba 1991).

5. Available at http://www.treasury.govt.nz.

6. For more on the analysis of value at risk, see chapter 5, Jorion (1997); 'J.P. Morgan's "RiskMetrics" documentation, which is available at http://www.jpmorgan.com; and the various reports available at http://www.contingencyanalysis.com.

7. In the extreme case of a guarantee of a risk that is negatively correlated with the value of the government's portfolio, assessment of risk in isolation would lead the government to think the guarantee created risk, when in fact it reduced it. That is, because the value of this guarantee tends to fall when the value of the rest of the government's portfolio rises, and vice versa, the total volatility of the government's wealth would be greater without the guarantee.

8. A useful short summary of asset–liability management can be found in Claessens (1992). Claessens (1993) and Masuoka (1990) provide longer summaries. Claessens and Qian (1991) apply the techniques to African countries. All of these papers address the risks that countries as a whole face, however, rather than the risks faced by the governments of the countries, the issue addressed by Lewis and Mody.

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2
Government Support to Private Infrastructure Projects in Emerging Markets

Mansoor Dailami and Michael Klein

ABSTRACT

Driven by fiscal austerity and disenchantment with the performance of state-provided infrastructure services, more than 100 governments have turned to the private sector to build, operate, finance, or own infrastructure in sectors such as power, gas, transport, telecommunications, and water. Private capital flows to developing countries are increasing rapidly, and some 15 percent of infrastructure investment is now funded by private capital in emerging markets.

Relative to needs, however, private investment in infrastructure is progressing slowly. The reasons why are clear: governments are reluctant to raise consumer prices to cost-covering levels, while investors, mindful of historical experience, fear that governments may renege on promises to maintain adequate prices over the long haul. Investors, therefore, ask for government support in the form of grants, preferential tax treatment, debt or equity contributions, or guarantees. All of these forms of support are subsidies. They differ in the way in which they allocate risks between private investors and government. When private parties assume risks that they can manage better than the public sector, efficiency gains will be largest.

When governments put in place good policies—in particular, cost-covering prices and credible commitments to stick to them—investors are willing to invest without special government support. Good macroeconomic policy matters because it affects the credibility of a price regime and trust in the convertibility of the currency, which is essential for foreign investors.

Privatization of assets without government guarantees or other forms of financial support is possible, even when governments are politically unable to raise prices, since investors can achieve the returns they demand by discounting the value of the assets they are purchasing. For new investments (greenfield projects), however, this is not possible. If prices have been set too low and the government is not willing to raise them, it must provide the investor with some form of financial support, such as guarantees. Guarantees and other forms of subsidy can facilitate worthwhile projects that would otherwise not go ahead. But government guarantees shift costs from consumers to taxpayers, who subsidize the price consumers pay. Much of that subsidy is hidden, since the government does not record the guarantee in its fiscal accounts. Moreover, taxpayers provide unremunerated credit insurance to the government, since the government borrows based on its ability to tax citizens in case the project fails, rather than on the strength of the project itself. If citizens are to reap the full benefits of private participation in infrastructure, governments must correct their policies. In particular, prices need to be raised to cost-covering levels and private investors need to assume risk.

▼ ▼ ▼

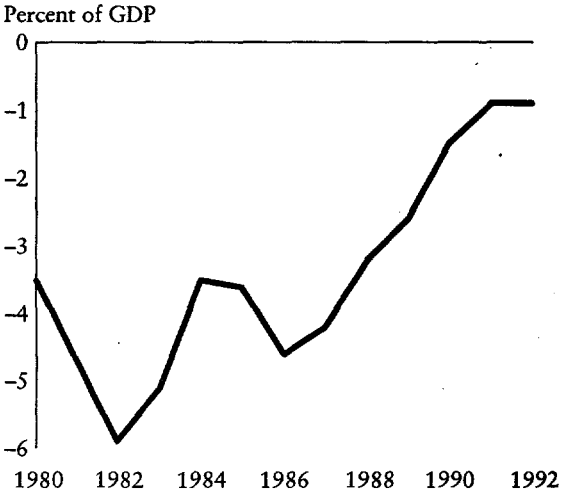
The Growth of Private Investment in Infrastructure

Following the debt crisis of the early 1980s developing countries significantly restricted public borrowing. The combined public sector borrowing requirement of all developing economies shrank from 6 percent of GDP in 1982 to 1 percent in 1993 (figure 2.1).

While public funding has been reduced, infrastructure investment requirements remain high. In 1994 the World Bank estimated them at $200 billion a year for developing countries. Since then other World Bank studies have increased these estimates. In East Asia and Latin America alone average annual investment requirements through 2005 have been estimated at $150 and $60 billion, respectively. Investment requirements tend to be dominated by the transport sector, followed by energy, telecommunications, and water. Required investments often reflect excess demand for services. That is, consumers would be willing to pay more for services, but prices are set at levels that are too low to attract suppliers. (Telecommunications may be an exception, as consumer prices exceed cost-covering levels in several countries, albeit sometimes because excise taxes are high.)

Driven by fiscal constraints and growing disenchantment with the performance of state-provided infrastructure services, more and more governments have turned to private solutions for financing and providing telecommunications, energy, transport, and water services (World Bank 1994). The trendsetters were Chile, the United Kingdom, and New Zealand. Deregulation of many sectors—including telecommunications, airlines, independent power generation, natural gas production and transmission, and freight traffic by road and rail—began even earlier in the United States in the late 1970s. During the 1990s the dual trend toward private involvement in infrastructure and deregulation has caught on in almost all countries.

FIGURE 2.1
Public sector borrowing requirement



Source: World Bank 1997a.

TABLE 2.1
Net long-term resource flows to developing countries

	1990		1996	
	In billions of dollars	*As share of total*	*In billions of dollars*	*As share of total*
Total flows	100.6	100	284.6	100
Sources				
Official development finance	56.3	56	40.8	14
Private flows	44.4	44	243.8	86
Recipients				
Public sector	62.8	62	84.8	30
Private sector	37.8	38	199.7	70
Foreign direct investment	(24.5)	(24)	(109.5)	(38)
Portfolio equity flows	(3.2)	(3)	(45.7)	(16)
Nonguaranteed debt	(10.1)	(10)	(44.5)	(16)
Bond	(0.1)	(0.1)	(20.8)	(7)

Source: World Bank 1997a.

Private markets are responding with vigor.[1] From 1990 to 1996 total net resource flows to developing countries rose from $101 to $285 billion a year (table 2.1). Private flows rose from $44 billion to $244 billion, while official development finance dropped from $56 to $41 billion. Cross-border flows dominate infrastructure finance, even in countries with very high national saving rates, partly because of the benefits investors gain from diversification but partly because of the underdevelopment of local capital markets in these countries.

Increasingly, private capital has funded private projects and firms rather than public expenditures. Between 1990 and 1996 public sector borrowing from private sources rose from $63 billion to only $85 billion, barely offsetting the drop in official development finance. In contrast, private capital (debt and equity) to private recipients rose from $38 billion to $200 billion.

Total infrastructure financing raised by developing countries rose from less than $1 billion in 1988 to more than $27 billion in 1996. Finance for private infrastructure rose from virtually nothing in 1988 to more than $20 billion in 1996 (table 2.2). Although the data on infrastructure capital flows are not strictly comparable with the data on capital flows, cross-border private infrastructure finance appears to account for about 10 percent of all private-to-private cross-border capital flows. About half of cross-border flows are invested from local sources in private infrastructure projects, so that total private investment may currently account for about 15 percent of a total estimated investment requirement of $200 billion a year.

Almost half of all private cross-border infrastructure finance appears to have been invested in East Asia, and more than a third was invested in Latin America (table 2.2 and figure 2.2). Power projects have attracted the highest share of investment, accounting for more than 40 percent of the total, followed by telecommunications and transport (figure 2.3).

Between 1990 and 1994 private infrastructure finance to developing countries grew at an annual average rate of 67 percent, reflecting the low base from which it started. Since 1994 growth has averaged 14 percent a year, well below the 19 percent growth rate of total private capital flows to developing countries (figure 2.4). (See also annex tables A2.1–A2.4.)

Why Infrastructure Is Different

To understand why private financing of infrastructure has not kept pace with overall financial flows to private entities it is necessary to recognize how infrastructure differs from other industries.

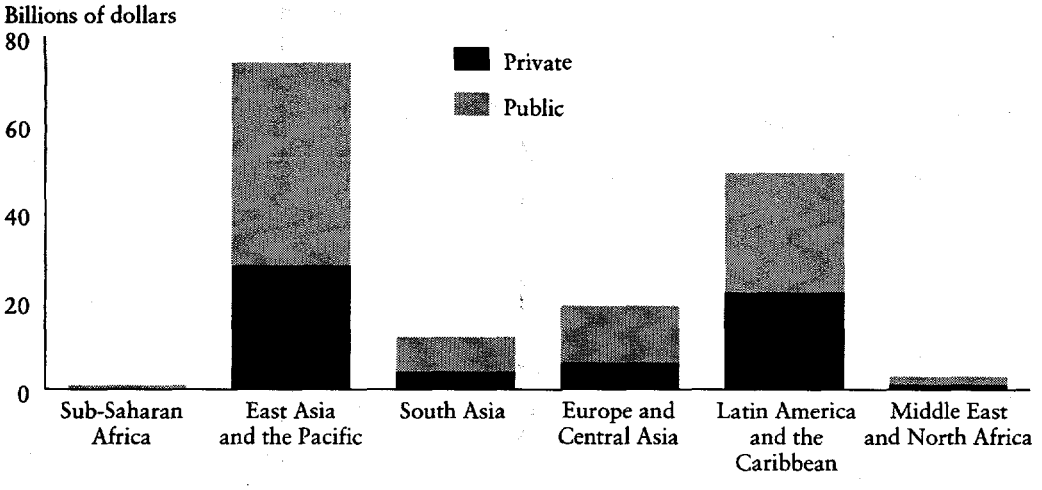
First, infrastructure services are often considered essential by consumers, and they are frequently provided by monopolists. Together these factors increase

TABLE 2.2
Private cross-border financial flows to infrastructure
(billions of U.S. dollars)

	1988	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Total	0.1	0.9	2.0	3.5	5.8	12.3	15.7	15.6	20.3
Loans	0.1	0.8	1.4	0.1	1.5	6.3	6.0	11.1	7.7
Bonds	0	0.2	0.5	0.7	1.1	3.9	5.8	3.3	7.2
Equity	0	0	0.1	2.6	3.1	2.1	3.9	1.3	5.4
Latin America and the Caribbean	0	0.2	0.3	3.1	3.6	4.7	6.6	2.1	7.8
Loans	0	0	0	0.02	0.2	0.3	1.6	0.7	0.7
Bonds	0	0.2	0.3	0.6	1.0	3.3	3.7	1.4	4.4
Equity	0	0	0.1	2.5	2.4	1.1	1.3	0	2.8
East Asia and Pacific	0.1	0.8	1.5	0.4	2.0	5.7	6.8	8.8	9.3
Loans	0.1	0.8	1.3	0.05	1.2	4.6	3.4	6.1	4.9
Bonds	0	0	0.3	0.2	0.2	0.3	2.1	1.7	2.4
Equity	0	0	0.02	0.1	0.6	0.8	1.3	1.0	2.0

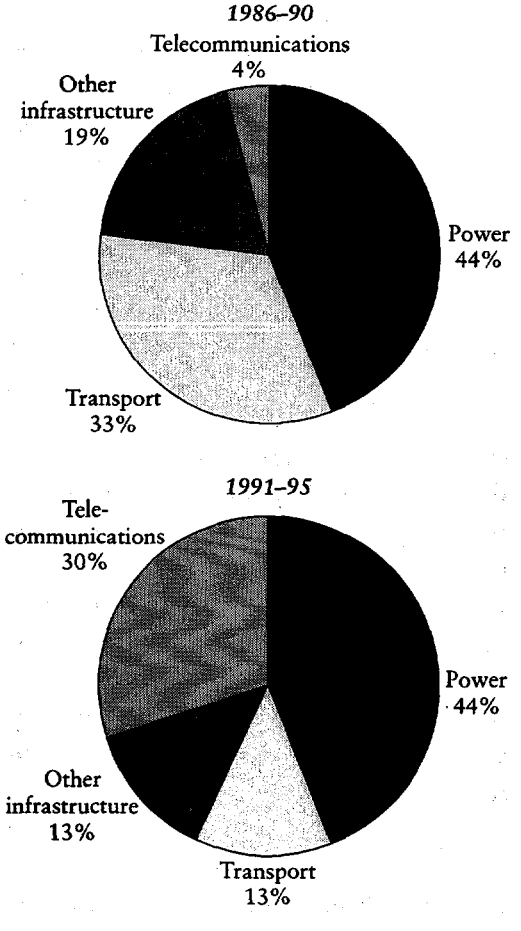
Source: World Bank 1997a.

FIGURE 2.2
Cumulative private sector borrowing for infrastructure, 1985–95



Source: Euromoney Loanware and Bondware; World Bank staff estimates.

FIGURE 2.3
Sectoral composition of infrastructure financing in developing countries



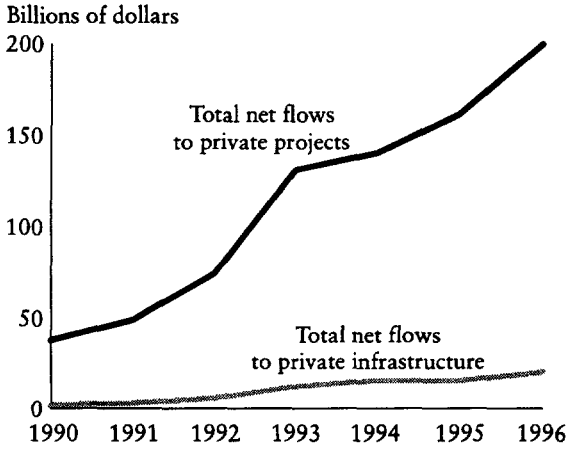
Source: World Bank 1994.

political sensitivity to the prices charged. Pressure from consumers to keep prices low makes it politically difficult for governments to maintain prices that cover costs. Indeed, the World Bank (1994) estimated that user fees fell far short of costs in gas, electricity, and water.

Second, infrastructure projects typically require large sunk investments that take ten to thirty years to recoup. Over such long periods of time investors are exposed to serious risks, in particular the risk that public authorities will not honor their agreements on tariff policy and payments to investors (Klein and Roger 1994). Once investors are committed to projects—and can pull out only by taking a huge loss—governments may be tempted to lower prices or not raise them as agreed. Investors thus risk being the victims of what has been called the "obsolescent bargain."

These factors help explain the familiar privatization–nationalization cycle that has been observed repeatedly (figure 2.5). Private entrepreneurs may initially develop infrastructure—building the first electricity networks, for example.[2] As these networks expand toward territories operated by other entrepreneurs, companies merge with or acquire their neighbors, creating larger, consolidated firms. These new firms are perceived as possessing significant monopoly power, and the services they provide—once considered luxuries—are now considered essential, creating pressure for

FIGURE 2.4
Net private flows to infrastructure, 1990–96

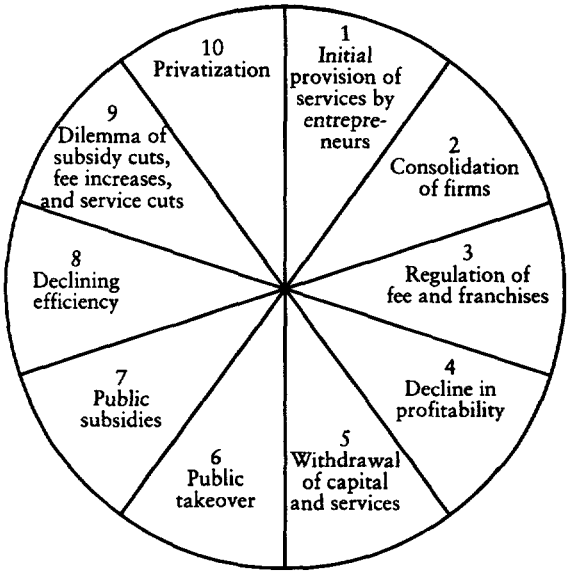


Source: World Bank 1997a.

monopoly regulation. Regulation, in turn, reduces prices and profitability, which discourages maintenance and new investment. In the face of declining quality and a slowdown in the industry's growth, the government nationalizes the firm. Low prices and inefficiency sap the finances of the state-owned firm, obliging the government to subsidize it. The very availability of subsidies, however, encourages more inefficiency. Eventually, concerns about fiscal subsidies and inefficiency create pressure for price increases and privatization—and the cycle begins again.

Because of the problem of sunk costs, and the historical experience of the "obsolescent bargain," investors are typically unwilling to make investments without adequate, frequently complex, contractual protection (Dasgupta and Sengupta 1993; Edlin and Reichelstein 1996). The negotiation of such contracts is time consuming and costly, however, and even the best contracts cannot fully protect investors against the efforts of a determined government. Enforceability of these contracts is essential, but it is difficult to achieve. Investors are continually faced with the possibility of changing contractual agreements or failure by the government to implement tariff adjustments because of political considerations. Even if arbitration and settlement of disputes in a third country are agreed on in advance—such as in the case of the Enron–Dahbol power project in India—such procedures can be time consuming and can add to the cost of the project.

FIGURE 2.5
The privatization-nationalization cycle



Source: Gomez-Ibanez and Meyer 1993.

The heavy foreign financing of infrastructure creates additional risks. Most infrastructure projects in developing countries are financed with significant amounts of foreign capital. A typical financing mix consists of 20–40 percent equity (provided by project promoters) and 60–80 percent debt, in the form of syndicated commercial bank loans, bond issues, bridge and backup facilities, and multilateral and export credit agency loans and guarantees. Exposure to currency risk, which is a relatively minor concern for foreign investors in export-oriented manufacturing industries, is a critical feature of infrastructure project investment. Project revenues are often generated in local currencies, while servicing of foreign debt and equity involves payment in foreign currency. Fluctuations in the exchange rate of the domestic currency, as well as capital controls limiting currency convertibility and transferability, create risk for foreign investors and financiers.

While prospects for currency convertibility and transferability have improved in many developing countries with the liberalization of their capital accounts and the surge in foreign capital inflows, the scope for exchange rate hedging and risk management through the use of forward markets or derivatives remains limited. With the exception of Brazil,

Malaysia, Mexico, and Thailand, where currency swap and forward markets have grown in the past two years, foreign exchange markets in developing countries suffer from a lack of instruments and liquidity.

The case of the Argentine private natural gas transport company, COGASCO, illustrates several of these problems. COGASCO started operating in 1981, with a guarantee from the central bank that it would be able to convert into hard currency its peso revenues from gas deliveries to state-owned Gas del Estado. In 1982 Argentina's foreign exchange reserves were low because of the conflict with the United Kingdom, and the government would have had trouble honoring its convertibility guarantee. Gas del Estado then reviewed the contract with COGASCO and claimed breach of contract, complaining that

TABLE 2.3
Types of sovereign or supranational support for private infrastructure projects

	Multilateral banks and export credit agency debt	*Government guarantees*	*Informal agreements*[a]	*Multilateral banks and export credit agency guarantees*
Country and project	Honduras: Electricidad de Cortes S. De R.L. de C.V (Elcosa I) 60-MW oil fired power plant; 15-years PPA	India: Dabhol 695-MW power plant; combined cycle; imported liquefied natural gas (LPG)/oil distillate; 20-year PPA with Maharashtra State Electricity Board; tariff 2.4 rupees ($.126) per KWh	Mexico: Mexico City Toluca Toll Road	Peru: Aguaytia 145-MW gas-fired power plant
Project cost	$70 million	$922 million	$313 million	$235 million
Date financial closure	1994	1995	February 1992	October 1996
Example by mechanism	IFC: $10.5 million senior debt (LIBOR + 375 bps, 12-year maturity) FMO: (Dutch)$10 million senior debt (LIBOR + 375 bps, 12-year maturity) IFC B: $10 million loan, 8-year maturity IFC: $3.5 million subordinated debt FMO: (Dutch) $1.0 million subordinated debt	12-year counter-guarantee from the government of India for tariff-payments by the Maharashtra State Electricity Board; and termination guarantee (capped at $300 million)	Concession guarantees traffic volumes by vehicle category, if traffic volumes fell short of amounts specified contract. Concessionaire entitled to request an extension of the concession term to permit recovery of its investments.	OPIC: $60 m political risk guarantee

a. Informal agreements include comfort letters, side agreements, nonbinding tariff increases, and other similar agreements.

COGASCO had found a more efficient way to run a liquid petroleum gas extraction plant than foreseen in the contract. The dispute meant that COGASCO was not paid, mooting the issue of currency convertibility. Because the investor's costs were sunk it had little leverage with the government and the government was unable to renege on its commitment. The dispute lasted until the late 1980s, when COGASCO and its parent company went bankrupt and foreign investment in the gas sector ground to a halt.

Because of this kind of risk, investors require high ex ante rates of return. In many cases real rates of return on equity exceed 20 percent (see annex table A2.5). This often results in prices that are higher than they were before privatization, when the real cost of capital was not taken into account.

Government equity participation	*Government debt (senior and subordinated)*	*Multilateral equity participation*	*Government grants*	*Preferential tax treatment*
Malaysia: Kuala Lumpur Sepang Airport Authority	Pakistan: Rousch 412-MW power plant CCPP residual fuel oil; 30-year PPA with Water and Power Development	Philippines: Pagbilao 735-MW power plant, coal fired, 25-year PPA with National Power Corporation	Brazil: Linha Amerala (10-year, 15 km, six-lane road)	Chile: 450-MW Empresa Electrica Pangue
$3,924 million	$507 million	$933 million	$174 million	$465 million
1993	1996	1993	June 1996	1993
$390 million in equity provided by the government of Malaysia	$40 million standby loan by National Development Finance Corp. (NDFC); $140 million subordinated debt channeled to the Pakistan Fund from the World Bank ($70 million) and JEXIM ($70 million)	IFC: $60 million ADB: $40 million CDC: $35 million	$112 million grant from the Rio de Janeiro municipal government	$10 million in deferred tax duties

Providing Financial Support to Attract Private Investors

To render projects attractive to investors despite these risks, governments have to raise user fees or provide special financial support to projects. Whichever route they choose, they need to provide credible assurances to investors that sensible binding obligations (the "rules of the game") will be honored.

Governments use an array of mechanisms to provide financial support to private infrastructure projects (table 2.3).[3] Some of these mechanisms, including preferential tax treatment, grants, and equity or subordinated debt contributions for which governments do not expect commercial returns, directly enhance project cash flow. In contrast, guarantees are targeted at particular risks, such as the risk that a state-owned party will renege on an obligation.

The government's obligations to provide support can be defined in laws, decrees, statutes, licenses, concessions, contracts, or other legally binding documents. Most countries have also signed some of the more than 1,200 bilateral investment treaties that define investor rights.

Investors and their counterparties normally agree on suitable methods for dispute resolution. If local courts are not credible, the parties can agree to international arbitration. Most countries have agreed to international conventions, which establish appropriate arbitration mechanisms and render arbitral awards enforceable.

In some cases counterparties may lack the cash flow with which to pay investors. Investors thus often seek additional assurances that any compensation due them under the terms of their contract will actually be paid. For example, the central governments may be asked to provide assurances that a publicly owned electric utility will honor its contracts with the private generating plants from which it buys power. Investors may also seek guarantees that their local currency earnings will be convertible and transferable out of the country.

In sum, infrastructure investors require special assurances that money due to them will be paid when due, in the currency they require. In this sense, all forms of government support ultimately amount to cash flow support to a project and have a significant fiscal impact.

Support through Government Guarantees

Governments often provide financial support by means of guarantees (box 2.1 and table 2.4). Central governments often guarantee the performance of subsovereign entities, including public enterprises and provincial or municipal governments.[4]

Through central government guarantees, project risks, such as the ability of a public utility to pay its private suppliers, can be transformed into countries risk. Countries can reduce their exposure by replacing

BOX 2.1
Government guarantees in OECD countries

Governments throughout the world provide guarantees to private investors in a variety of activities. Prominent among such guarantees are deposit insurance for bank depositors and pension or social security insurance. Guarantees for housing, agriculture, students, exports, and public corporations dominate the picture in OECD countries; little is known about the make-up of guarantee exposure in developing countries. Even in OECD countries information on guarantee exposure is sketchy. Data suggest that total guarantee exposure may amount to 15–20 percent of GDP, or more than a quarter of gross debt. This does not, of course, capture implicit guarantees, under which government may feel obliged to bail out failing firms or banks or help uninsured citizens in need (in the wake of natural disasters, for example).

Guarantee programs can provide valuable support for private economic activity. But they can be costly: in recent years several industrial countries have suffered large losses under some of their guarantee programs, including deposit insurance and export credits. During the 1980s OECD export credit agencies incurred losses equivalent to about 20 percent of new business, while collecting premiums of only 3 percent. Most of the export credit losses were on medium- and longer-term credit. This experience prompted a change in guarantee management procedures. The United States has instituted more transparent accounting principles for its guarantee operations under the 1991 Credit Reform Act. The experience of export guarantee schemes is relevant for governments considering guaranteeing long-term infrastructure investment, as risks are similar (medium- to long-term country risk), although the risk in infrastructure investment may be higher because of the risk of regulatory failure or creeping expropriation for firms with immobile investments, such as power plants.

TABLE 2.4
Types of government guarantees in private infrastructure projects

Type of guarantee	*Projects*
Contractual obligations of government entities	
• Guarantee of off-take in power projects	Birecik Hydro Power Plant, Turkey Electricidad de Cores, Hungary Paguthan & Dabhol Power Plants, India Mt. Aop Geothermal Plant, Philippines
• Guarantee of fuel supply in power projects	Termopaipa Power Plant, Colombia Lal Pir Power, Pakistan
Policy/political risk	
• Guarantee of currency convertibility and transferability	Lal Pir Power, Pakistan
• Guarantee in case of changes of law or regulatory regime	Rousch Power, Pakistan Izmit Su Water Treatment Plant and Pipeline, Turkey
Financial market disruption/fluctuations	
• Guarantee of interest rate	North-South Expressway, Malaysia
• Guarantee of exchange rate	North-South Expressway, Malaysia
• Debt guarantee	Toll roads, Mexico Termopaipa Power Plant, Colombia
Market risk	
• Guarantee of tariff rate/sales risk guarantee	Don Muang Tollway, Thailand Western Harbour Tunnel, Hong Kong Buga-Tulua Highway, Colombia Toll roads, Mexico
• Revenue guarantee	South access to Concepción, Chile M5 Motorway, Hungary

full credit guarantees with more narrowly defined guarantees such as power purchase agreements. Such unbundling of risks presumes that the parties can be trusted to honor their commitments; if they cannot be trusted, investors will prefer full guarantees. This helps explain why countries with low credit ratings rely heavily on full financing by export credit agencies or multilaterals, whereas countries with higher credit ratings offer guarantees for specific risks (see table 2.5). Support by multilaterals and export credit agencies appears to substitute for an international contract enforcement mechanism.

Valuing and Charging for Government Guarantees

Guarantees provide (contingent) cash flow support to projects and are, in many respects, similar to loans or grants. To be able to compare all forms of assistance, it is useful to calculate the subsidy implicit in each form of support. These "subsidy equivalents" help determine, for example, whether it is cheaper for the government to provide a guarantee or some other form of support. (For more on the role of guarantees in infrastructure finance see Dailami 1997.)

The fact that government guarantees can be valued and may be expensive to government does not imply that governments should charge investors for the guarantees. When government guarantees merely substitute for low prices, charging the full cost of the guarantee would defeat the purpose of the guarantee.

When the guarantor can manage or bear the risk better than the investor, however, the value to the guaranteed party is higher than the cost to guarantor, and the investor may be willing to pay part or all of the cost for a guarantee. Some commercial risks are insured by private insurance companies for this rea-

TABLE 2.5
Patterns of sovereign or supranational support for private infrastructure projects

Type of support	*Number*	*Pattern*
Multilateral banks and export credit agency debt	37	Greater incidence of debt assistance by multilateral banks and export credit agencies in non-investment grade emerging markets (27).
Government guarantees	28	Nearly three times as many government guarantees in non-investment-grade countries (24) than in investment-grade countries (9).
Informal agreements[a]	28	Although 9 agreements were issued in Mexico, use of informal agreements is more common in investment grade countries (11).
Multilateral banks and export credit agency guarantees	26	Slightly more examples among noninvestment-grade emerging markets (15) than in investment-grade countries (11).
Government equity participation	18	Greater incidence of government equity participation in investment-grade countries (11).
Government debt (senior and subordinated)	14	Equal split among noninvestment and investment-grade countries.
Multilateral equity participation	13	Much greater incidence of equity shareholding by multilateral banks and export credit agencies in noninvestment-grade emerging markets (11).
Government grants	12	Greater incidence of government participation through grants in non-investment grade countries (8).
Preferential tax treatment	2	Limited use of preferential tax treatment in investment grade countries.

a. Informal agreements include comfort letters, side agreements, nonbinding tariff increases, and other similar agreements.
Note: Financing packages of 78 projects (39 power, 26 transport, 7 water/waste, 4 telecommunications, and 2 gas) were disaggregated and then tabulated by type of mechanism and source of funds. All 78 projects have direct participation by the private sector through the provision of debt, equity, or both.

son. Governments, however, should not be insuring commercial risks, even on a fee basis.

To the extent that private insurers are willing to provide cover for political risk, they need to charge for the value of a guarantee. Governments, however, would be extracting rents from good policy by charging for such guarantees: charging for political risk guarantees would be akin to demanding protection money. Governments should instead ensure that the benefits to investors of such guarantees are passed on to consumers—by awarding projects competitively, for example.

Complications Arising from the Risk of Sovereign Default

Sometimes the government's power of taxation enables it to honor any obligations it has entered into to provide support to a private infrastructure project. Official export credit and mortgage insurance schemes in the United States are examples. In some developing countries, however, the risk of sovereign default is real, and its implications must be considered in structuring government support to private infrastructure companies. The key task is to evaluate infrastructure projects financially within the country risk environment prevailing in developing countries (see Dailami and Leipziger 1997).

When there is a risk of default, one or more creditors or investors may lose all or part of their investment. By obtaining government guarantees an investor or creditor obtains a position near the front of the queue for repayment and secures access to sources of compensation not related to the project, generally taxation. By obtaining a supporting guarantee from an institution such as the World Bank, a private investor can buy a place right at the front of the queue, benefiting from the preferred creditor status of the World Bank. It is not clear, however, whether such guarantees simply improve some investors' positions relative to others' or whether it contributes to a better overall outcome (see Dooley 1997).

The key issue is whether and how the structure of government liabilities may affect the outcome of government liability renegotiations. Even if renegotiation of government liabilities over extended periods of time preserves the net present value of creditor or investor claims, there may be real economic losses, since assets funded by investors may not be used as efficiently as they would otherwise have been during the often acrimonious work-out process. For example, a water concession may not be maintained as well during a dispute as otherwise.

Different creditors or investors hold different types of claims. They thus have varying interests to negotiate. Some "tough" investors may hold up renegotiation, thus imposing real losses (due to the less efficient use of assets during the renegotiation), for which the tough investor does not pay. When a government issues guarantees to an infrastructure investor it tends to create yet another type of claim. In particular, the guarantee may be issued to an investor who has some physical control over the assets. This gives the guarantee holder bargaining power that differs from that of a holder of sovereign debt, for example. To some extent that may be justified for the same reason that trade credit gets treated preferentially during debt renegotiations so as not to disrupt basic economic activity with adverse consequences for all.

To achieve a solid and reasonably speedy settlement in order to minimize economic disruption resulting from inefficient asset use, a mechanism needs to be in place that allows creditors and investors to resolve their differences quickly. This is achieved more easily if the claims held by different investors are similar and the government has the flexibility to come up with various ways of settling its obligations.

When a country properly accounts for its contingent liabilities and reserves for them fiscally, they appear more like normal debt. In fact, it may be preferable for the government to support projects by providing debt finance rather than guarantees. If so, it could be argued that, to provide governments with the right incentives to do so, exposure under government guarantees should be valued like debt and not be reduced by adjusting for probability of default. In a sense such an ultra conservative policy is equivalent to debt management policies in various advanced OECD countries. Germany, for example, actually values certain guarantees the same way as debt with the same maximum exposure.

Beyond making claims more similar to each other, can a commitment mechanism be chosen to facilitate speedy claims resolution? The COGASCO example, mentioned earlier, illustrates that project-based renegotiation can last as long as sovereign debt settlement, with deleterious consequences for investment in a particular sector. It may therefore be useful to involve multilateral creditors, because their interests and actions may be most closely aligned and they may thus help advance resolution most speedily.

It is thus by no means clear that finely tuned risk allocation is always the right approach. Blunter instruments, such as straight sovereign debt, may at times be preferable. The argument for seeking participation by multilaterals may have little to do with the nature of the risk management or product they provide and more with the role they are likely to play in debt renegotiation.

Reforming Policy to Attract Investors

Although guarantees can provide some comfort to investors, a country's interests are better served by thorough-going policy reform. The best way of attracting private investment is by establishing stable macroeconomic policies, adequate tariff regimes, a track record of honoring commitments, and reasonable economic policymaking. In many OECD countries and other industrial economies, such as Singapore, investors may not require guarantees or other government support, and they may be willing to accept "change of law" risk, which may affect tax rates or other project cost or revenue parameters.

In many emerging markets, however—including relatively advanced economies such as Chile—investors may not find the right policies in place, or they may doubt the government's ability to sustain such policies over long periods of time. Governments still have a variety of options for reducing the need for special project support.

Projects are subject to country- and project-specific risks. Risks related to a country's overall health tend

TABLE 2.6
Credit ratings and signed project finance deals, 1996

Country	Rating	*Value of deals per capita ($/population)*	Country	Rating	*Value of deals as a percentage of GDP*
Qatar	BBB	8,564	Hong Kong	A	13.5
Hong Kong	A	3,229	Indonesia	BBB	7.1
Australia	AA	705	Thailand	A	5.7
Greece	BBB–	282	Chile	A–	4.9
Chile	A–	234	Pakistan	B+	4.5
United Kingdom	AAA	227	Malaysia	A+	4.2
Saudi Arabia	NR	214	Australia	AA	3.7
United States	AAA	185	Greece	BBB–	3.2
Malaysia	A+	178	Saudi Arabia	NR	3.1
Thailand	A	159	Turkey	B	2.4
Canada	AA+	151	India	BB+	2.1
Argentina	BB	99	Argentina	BB	1.2
Italy	AA	78	China	BBB	1.2
Germany	AAA	76	United Kingdom	AAA	1.2
Indonesia	BBB	73	Brazil	BB–	0.8
Turkey	B	63	Canada	AA+	0.8
Brazil	BB–	37	United States	AAA	0.7
Pakistan	B+	21	Italy	AA	0.4
India	BB+	7	Germany	AAA	0.3
China	BBB	7	Qatar	BBB	n.a.

Note: Population and GDP data are for 1995.
Source: Euromoney; World Bank 1997b; World Bank staff estimates.

to be of prime importance. Risks such as currency and interest-rate risks reflect macroeconomic volatility and the risk that the government will not honor its obligations (country risk proper).

That governments with stable macroeconomic policies can attract private infrastructure investors more easily is reflected in the sovereign debt ratings given by various rating agencies and services (see annex table A2.5). As country ratings improve, governments are able to attract more and more project finance (table 2.6) (although project finance accounts for only a small percentage of GDP in the most creditworthy countries, where corporate finance is used to finance deals).[5]

Problems with Financial Support without Policy Reform

The jury is still out on the consequences of government guarantees and other forms of financial support: although they may have increased the volume of investment, they may not have solved the underlying problems. Several examples illustrate the types of problems that can remain when projects go ahead, with various forms of government support, in the absence of serious policy problems.

The Mexican toll road program generated several billion dollars of nonperforming assets in the domestic banking system. No explicit guarantees had been issued to creditors, but local banks expected the government to bail them out once the toll roads ran into financial difficulties. The government was forced to come to the banks' aid at the worst possible time—during the currency crisis of 1994/95.

The failure of private toll roads has caused problems in other countries as well. In Thailand the Bangkok expressway required government rescue after the authorities declined to raise tolls in line with earlier agreements. In Spain the government was obliged to pay out $2.7 billion when exchange rate guarantees were called during the 1970s and 1980s.

Other types of projects have also been affected. Malaysia's power company, TENAGA, contracted with private generators (backed by a government guarantee) to supply more power, but consumer tariffs were left

unchanged. As a result TENAGA was not able to carry the full cost of private generation forward and was squeezed financially, forcing it to neglect maintenance and investment. Power cuts throughout the country followed—exactly the outcome the new generation capacity was intended to prevent.

In Mexico a water concession in Aguascalientes was concluded in 1993. To guard against currency risk, variable-rate debt financing was obtained in the local markets. Water prices were thus not indexed to exchange rate movements but (partially) to changes in interest rates on domestic debt and inflation. Following the foreign currency devaluation in 1994/95 inflation and domestic interest rates rose, which should have caused large nominal tariff increases. A political decision was made, however, not to raise tariffs as foreseen in the concession contract. Instead the government took on the financing of new investment that the concessionaire was supposed to have made.

These cases have some key features in common. First, problems were resolved by negotiation, as they usually are in cases of government-related risks. In contrast, disputes over technical or commercial risks are often resolved in court. Second, the government generally ended up bearing a substantial part of the costs—costs that could have been avoided if the government had allowed consumer prices to cover full project costs.

These examples reveal how the basic forces that drive infrastructure privatization assert themselves. Private investors do not—and should not—pay for projects; they can only finance them. Either consumers or taxpayers have to pay for projects in the end. If the government cannot raise money from taxpayers, consumer prices must be adequate. Therefore, when privatization is motivated by fiscal constraints, user fees must be raised to cost-covering levels. Projects that cannot be funded by user fees should not, in the absence of important positive externalities, be built.

Government support could lower overall project cost only if the government had a lower cost of capital than private parties. Although government borrowing costs are often ostensibly lower than private borrowing costs, governments borrow at lower rates not because they tend to operate lower risk projects but because taxpayers stand behind them, providing unremunerated credit insurance. If taxpayers were remunerated for their exposure, the ostensible advantage of government finance would presumably disappear. If not, governments should finance everything, including large corporations—a return to GOSPLAN, which appears nonsensical (Klein 1996).

Government support to private projects compensates private investors for the risks they are unwilling to bear given the prices they receive. Investors may be attracted to infrastructure projects without guarantees if the expected returns are high enough (that is, when rates charged to consumers are high enough).[6] In that sense the search for guarantees or other forms of government support is a search for suckers who can be made to pay what others are not willing to pay. Guarantees themselves do not appear to affect the cost of capital, which is determined by the risks of the project, not the financing structure. As recent review of the effect of World Bank partial credit guarantees (Huizinga 1997) suggests, the existence of guarantees did not reduce nonguaranteed interest rates, and the duration of nonguaranteed debt remained relatively short.

Privatization of Existing Assets

Recent transactions have shown that even countries with subinvestment grade ratings can attract sizable private investment without special government guarantees if sound sector policies are made credible. Privatizing existing assets reduces the role of government and with it fears of noncommercial interference. In Argentina, Bolivia, and Peru, for example, where certain sectors, such as electricity, were privatized, private investment has been made without government guarantees.

Privatization also allows investors to earn high rates of return without raising consumer tariffs, since investors discount the sale value of assets to the point at which existing tariffs generate the required rate of return, rather than by raising tariffs, as they would have to do in greenfield projects. In fact, tariffs can actually fall after privatizations, as they did in the Buenos Aires water concession, in which the assets of the system were given to the private investor free of charge.[7]

Privatization has also attracted more equity investors than have new investment projects. Since equity markets are easier to develop than long-term debt markets in most developing countries, privatizations have been able to rely more on local currency financing than have greenfield investment projects. The typical new investment project requires about two-thirds foreign finance, whereas the typical privatization has attracted two-thirds of its finance from local markets (International Finance Corporation 1996).

Many privatizations have occurred in subinvestment grade countries (that is, in countries with credit ratings of less than BBB–), including Argentina, Bolivia, and Peru. Privatization has allowed these countries to attract investment despite their unstable macroeconomic environments, allowing them to make the most of existing assets rather than to add new investments.

Greenfield Projects

Government guarantees and financial support are more difficult to avoid for new investments, for which prices must be raised. Well-structured project finance for greenfield projects may allow governments to avoid guarantees or other forms of support, however. Under project finance investors look to cash flow generated by the project to amortize debt and to pay interest payments and dividends.[8] Project finance can help investors structure a project so that different risks can be separated and allocated to the parties most willing to bear them. An example is the Mamonal power project in Colombia, where a foreign power generator sells electricity directly to private firms at cost-covering prices. This project structure has allowed the project company to set high user fees and rely on payment discipline by creditworthy corporate customers rather than on government guarantees.

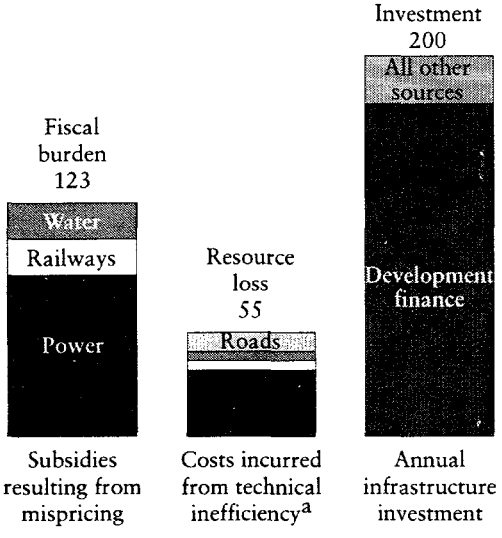
Several countries are trying to reduce reliance on sovereign support for new infrastructure projects. Most of the countries that have been successful in doing so have had investment-grade ratings. Indonesia attracted investors by issuing comfort letters on foreign exchange convertibility in its PAITON power project. China and India have declared that they are unwilling to issue sovereign guarantees for private infrastructure projects. In China, an investment-grade country, investors have been willing to accept guarantees from provincial governments in place of the national government. In India, a subinvestment-grade country, the verdict is still out, but it appears that projects going ahead require heavy backing from state-owned financial institutions.

Colombia, an investment-grade country, has been able to move away from sovereign guarantees in projects in which ECOPETROL, the state-owned oil company, is backing payment obligations (Centragas and Transgas). Several Colombian entities have recently issued investment-grade paper (for the El Dorado airport expansion and the city of Bogotá). Petropower, a Chilean co-generation project, was able to issue bonds in the U.S. capital markets without the help of the government or supranational agencies. Although Argentina is not an investment-grade country, Transportadora de Gas del Norte in Argentina was able to issue investment-grade paper with the help of International Finance Corporation (IFC) participation (other innovative capital market issues are described in annex table A2.6).

Rethinking the Problem of Future Investment Requirements

The "financing gap" may in fact be a "policy gap"—what is needed is not so much the mobilization of new financial resources on a vast scale but a thoroughgoing reform of policy. Raising consumer prices to cost-covering levels would generate some $123 billion a year, allowing infrastructure companies to fund most of the $200 billion a year needed for infrastructure from internal cash generation, leaving only $77 billion to be funded in the financial markets (World Bank 1994). In addition, private participation could create efficiency gains of $55 billion a year, reducing financing requirements to $22 billion (figure 2.6). Moreover, the increase in tariffs to consumers should reduce demand and therefore investment requirements. To be politically able to raise consumer prices and to obtain the benefits of greater efficiency, governments should proceed with privatization. If they choose to go this route, however, the long-run financing problems will be minimal—financing require-

FIGURE 2.6
Estimated cost of mispricing and technical inefficiency



a. Costs for the water sector are due to leakages; for railways, to fuel inefficiency, overstaffing, and locomotive unavailability; for roads, to added investment caused by poor maintenance; for power, to transmission, distribution, and generation losses.
Source: Ingram and Fay 1994.

ments from sources other than internal cash generation may not be much larger than the existing level of private capital flows.

The shift to private infrastructure finance reduces the financing requirements of the country as a whole only if private investors generate efficiency gains (that is, they provide the same level of service at lower cost). For efficiency gains to materialize the private sector needs to bear risks it can manage better than the public sector. As long as financial structures are found that shift some of those risks away from the government—even if limited guarantees remain—benefits can be obtained from privatization. The fact that privatization reduces the likelihood of noncommercial interference by government can be the source of major efficiency gains (Galal, Tandon, and Vogelsang 1994).

Managing Guarantee Exposure during the Transition

In the long run, governments can attract private investment in infrastructure without providing guarantees if they have good policies in place. The most difficult challenges arise during the transition from publicly to privately funded infrastructure, when guarantees are most common. Even during the transition, however, government guarantees risk simply postponing the day of reckoning. Assuming that private investors cannot consistently be duped into investing in unsustainable projects, providing guarantees imposes costs on taxpayers in the future. For this reason alone governments should develop ways of quantifying all their exposures to private infrastructure projects and reserving for them fiscally.

Two governments in the developing world—the Philippines and Colombia—are trying to develop ways to manage their guarantee exposure. Both countries are establishing ways of valuing their exposure and creating fiscal reserves against it. Managing guarantees correctly will demonstrate the fiscal cost of not implementing good policies and will help garner support for more lasting reform.

Governments must also recognize their exposure from implicit guarantees. Ways must be found to manage implicit guarantees by letting investors (at least equity investors) go under in case of failure. Mechanisms must be established that allow new investors to take the place of old ones to ensure service continuity to consumers. If this cannot be done, implicit guarantees should be treated like explicit ones, and reserves should be budgeted to cover these contingent liabilities.

Conclusion

Governments can attract private investment in infrastructure in two ways. They can offer financial support to investors—in the form of grants, cheap loans, or guarantees—in order to compensate them for low tariffs, unstable macroeconomic conditions, poor performance by state-owned enterprises, and other problems. Or they can address the policy problems that underlie investors' concerns by raising prices to cost-covering levels, ensuring macroeconomic stability, and establishing a sound regulatory framework.

Both methods can attract investors, but the provision of government support tends not to reduce overall costs. Instead, it allocates costs to taxpayers, who

have no choice but to accept them. The costs of providing guarantees may be deferred, but they are real—as the examples of the Mexican and Spanish toll roads show so vividly. In contrast, policy reforms such as price increases and the establishment of credible regulatory frameworks improve project fundamentals, making them attractive to investors without imposing extra costs on captive taxpayers.

Notes

The authors would like to thank Albert Amos, Anita Hellstern, and Matthew Harvey for valuable research assistance.

1. The key sources for the information presented here are Project Finance International (1997), Sayer (1997), Vives (1997), and World Bank (1997a).

2. Some countries may begin with public ownership, but the cyclical forces are the same.

3. In fact, they have been doing so for some time. Land grants and credit guarantees for international bond issues were extended to railroads in India and South Africa in the nineteenth century, for example.

4. Such guarantees are primarily meant to support providers of long-term debt. Project financings are typically funded with a very high share of debt, usually ranging from 60 to 80 percent of total project cost. Reliance on steady uninterrupted adherence to scheduled debt repayment is key to the remuneration of long-term creditors, who do not benefit from the high returns that equity holders may expect. Guarantees of continuous creditworthiness are thus of great value to creditors.

5. In project financing, debt often accounts for 60–80 percent of total project cost. In contrast, corporate finance and equity, particularly in the form of internal cash generation, tends to dominate funding. For a discussion of corporate finance in developing countries see Dailami (1992). Project financing has also been revived in industrial countries as a method of financing large-scale investment projects (see, for instance, Kensinger and Martin [1988]; Chen, Kensinger, and Martin [1989]; and Nevitt and Fabozzi [1995]).

6. In some cases risks are so high that no investors will invest, and funding is effectively rationed.

7. There is no fundamental difference between a concession, in which the government remains the notional owner, as in the French water system, and a full asset sale, in which the government retains special supervision rights defined in a license, as in the water privatizations in England and Wales.

8. Under corporate finance investors look toward the cash flow of the whole company that sponsors the project. Corporate finance allows project sponsors to use other existing revenue-earning activities to "collateralize" investment in a project. Various hybrid schemes exist such as project finance of a toll road expansion that benefits at the same time from toll collection on already completed stretches of highway.

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Annex

TABLE A2.1
Signed project finance deals, by country, 1996

Country	*Standard & Poor's long-term, foreign currency sovereign debt rating (March 11, 1997)*	*Number of signed project finance deals*	*Value of signed project finance deals ($ millions)*	*Value of signed project finance deals, by population ($ million/ per capita)*	*GDP ($ millions)*	*Value of signed project finance deals as a percent of GDP*
United States	AAA	103	48,669	185.0	6,952,020	0.70
Hong Kong	A	36	19,376	3,229.3	143,669	13.49
Indonesia	BBB	72	14,145	73.0	198,079	7.14
United Kingdom	AAA	41	13,227	227.0	1,105,822	1.20
Australia	AA	44	12,731	705.3	348,782	3.65
Thailand	A	31	9,432	158.8	167,056	5.65
China	BBB	64	8,383	6.9	697,647	1.20
India	BB+	28	6,911	7.4	324,082	2.13
Germany	AAA	9	6,236	76.4	2,415,764	0.26
Brazil	BB–	23	5,796	37.2	688,085	0.84
Qatar	BBB	3	4,710	8,563.6	—	—
Canada	AA+	23	4,469	150.9	568,928	0.79
Italy	AA	6	4,443	77.7	1,086,932	0.41
Turkey	B	14	3,890	63.1	164,789	2.36
Saudi Arabia	NR	6	3,833	214.4	125,501	3.05
Malaysia	A+	13	3,575	177.5	85,311	4.19
Argentina	BB	19	3,447	99.1	281,060	1.23
Chile	A–	15	3,321	233.9	67,297	4.93
Greece	BBB–	2	2,951	282.1	90,550	3.26
Pakistan	B+	13	2,738	21.1	60,649	4.51

Note: Population and GDP data are for 1995.
Source: Project Trade and Finance Database; World Bank 1997b; Standard & Poor's; World Bank staff estimates.

TABLE A2.2
Top ten emerging markets for project finance deals, 1996

Country	*Number of projects*	*Total project value ($ millions)*
Indonesia	72	14,145
Thailand	31	9,432
China	64	8,383
India	28	6,911
Brazil	23	5,796
Turkey	14	3,890
Malaysia	13	3,575
Argentina	19	3,447
Chile	15	3,231
Pakistan	13	2,738

Source: Project & Trade Finance March 1997.

TABLE A2.3
Top ten emerging markets, 1995–96

1995		*1996*	
Country	*Millions of dollars*	*Country*	*Millions of dollars*
Indonesia	3,384	Indonesia	4,306
Qatar	1,911	Colombia	1,557
Mexico	1,066	Philippines	1,097
Pakistan	1,062	Argentina	735
Turkey	929	Mexico	272
Colombia	660	Thailand	272
China	621	India	267
India	523	Chile	167
Chile	500	Poland	128
Hungary	397	Pakistan	97

Source: Project Finance International 1995; *Project Finance International* 29 January 1997.

TABLE A2.4
Privatization transactions in selected emerging markets, 1991–95

Country	*Number of infrastructure privatizations*	*Total number of privatizations*	*Infrastructure privatizations as a percentage of total privatizations*
Argentina	11,424	14,378	79.5
Mexico	4,958	21,278	23.3
Malaysia	4,248	8,735	48.6
Hungary	4,064	7,013	57.9
Indonesia	3,428	4,014	85.4
Peru	2,520	4,457	56.5
Venezuela	1,983	2,501	79.3
China	1,370	7,033	19.5
Czech Republic	1,361	2,297	59.3
Pakistan	1,011	1,565	64.6
India	973	4,447	21.9
Russia	787	1,255	62.7
Bolivia	770	811	94.9
Philippines	629	3,338	18.8
Brazil	491	9,606	5.1
Chile	403	619	65.2
Turkey	347	2,401	14.4
Thailand	180	953	18.9
Poland	172	2,932	5.9
Latvia	160	160	100.0
Slovak Rep.	28	1,482	1.9
Estonia	6	245	2.6
Nigeria	3	176	1.6
Vietnam	1	3	22.2
Colombia	—	905	0.0
Jordan	—	15	0.0
Kazakhstan	—	315	0.0
Oman	—	62	0.0
Slovenia	—	521	0.0
South Africa	—	5	0.0
Uruguay	—	2	0.0
Zimbabwe	—	307	0.0
Total	39,583	114,964	34.4

Source: World Bank Privatization Database; International Economics Department; World Bank staff estimates.

TABLE A2.5

Sovereign credit ratings, country risk assessment, and sovereign defaults in selected emerging markets

Country	*Standard & Poor's long-term foreign currency sovereign debt rating (April 9, 1997)*	*Moody's long-term foreign currency sovereign debt rating (April 9, 1997)*	*Euromoney country ratings (March 1997)*	*Institutional Investor country ratings[a] (March 1997)*	*Years in default (foreign currency external bank debt)*
Malaysia	A+	A1	83.32	67.5	None
Thailand	A	A2	77.09	61.1	None
Czech Republic	A	Baa1	74.54	62.8	None
Chile	A–	Baa1	79.94	62.0	1983–90
Slovenia	A	A3	73.97	52.1	1992–95
China	BBB	A3	70.50	58.0	None
Indonesia	BBB	Baa3	70.95	51.6	None
Latvia	BBB	NR	55.04	29.1	None
Hungary	BBB–	Baa3	70.06	47.6	None
Oman	BBB–	Baa2	69.92	52.8	None
Colombia	BBB–	Baa3	63.68	47.7	None
Poland	BBB–	Baa3	56.58	47.9	1981–94
Slovak Rep.	BBB–	Baa3	63.46	43.9	None
India	BB+	Baa3	64.61	46.3	None
South Africa	BB+	Baa3	69.88	46.0	1985–87, 1989, 1993
Philippines	BB+	Ba2	63.14	42.3	1983–92
Uruguay	BB+	Ba1	63.42	41.7	1983, 1987, 1990–91
Peru	BB+	B2	48.19	32.0	1976, 1978, 1980, 1984–95
Mexico	BB	Ba2	64.14	42.6	1982–86, 1988–90
Argentina	BB	B1	59.17	39.9	1982–93
Jordan	BB–	Ba3	53.20	33.8	1989–93
Russia	BB–	Ba2	43.97	23.5	1991–95
Brazil	BB–	B1	59.11	38.8	1983–94
Kazakhstan	BB–	Ba3	40.25	20.9	None
Pakistan	B+	B2	48.94	27.7	None
Turkey	B	B1	53.39	40.8	1978–81
Venezuela	B	Ba2	49.08	33.1	1983–88, 1990
Vietnam	NR	NR	52.41	32.5	1985–95
Zimbabwe	NR	NR	42.00	32.3	None
Estonia	NR	NR	53.21	33.6	None
Nigeria	NR	NR	26.78	14.8	1982–92
Bolivia	NR	NR	45.93	24.9	1980–93

NR Not rated.

a. The scale for Euromoney and Institutional Investor country credit ratings range from 0 to 100. The highest possible score is 100 and the lowest possible score is 0.

Source: Standard & Poor's; Moody's; Euromoney; and Institutional Investor.

TABLE A2.6
Capital market innovations, 1991–96

Year	*Capital Market Innovation*	*Project*	*Project Location/ Country of Origin*
1991	Developer took long-term project risk.	Midlands Power Project	United States
1992	Project received investment grade rating and obtained capital market financing in precompletion stage.	Sithe Energy 144A Bond Offering	United States
	Project risk undertaken by developer in transport sector project in an emerging market. Longer maturities. Securitization of toll road revenues through offshore debt fund for a 144a issue.	Mexico City-Toluca Toll Road	Mexico
1993	Developer took long-term market risk.	Deer Park Refinery	United States
	Pooling debt of multiple projects. Project financing to receive an investment grade.	Refinancing of Project Partnerships owned by Coso Energy	United States
	First IPP in Latin America.	Mamonal Power Project	Colombia
	First major private infrastructure project in Eastern Europe. Project also did not have government guarantees.	M1/M15 Motorway	Hungary
	Project risk undertaken by developer in power sector in emerging market.	Subic Bay Power Project	Subic Bay, Philippines
1994	Construction risk was undertaken by project developer.	Indiantown Cogeneration	United States
	Debt of multiple projects was pooled to provide liquidity for investors in an otherwise illiquid long-term fund.	Energy Investors Fund Pooled Portfolio Refinancing	United States
	Limited recourse refinancing of an IPP in the public bond markets in Europe.	Kilroot Electric Bond Issue	Northern Ireland, United Kingdom
	Take-or-pay contract with state-owned utility allowed for much longer maturities (10 years versus 50 years).	YTL Power Generation Local Currency Bond Issue	Malaysia
	First investment-grade project finance bond issue from an emerging market. Construction and operation risk in emerging market.	Centragas Bond Issue	Colombia
	First financing in the U.S. for a Chinese power project. Blind pool / power projects.	LIPTEC 144a Bond Offering	China
	Rated Asian project financing of raising funds in the United States.	Regco Project Financing	Thailand
	Debt fund created to secure private loan. Eligible for CARIFA bonds. Used multilateral bank guarantees to fund IPP.	Rockfort Power Project	Jamaica
	Market risk for power project in emerging market.	Alicura Hydro Project	Argentina
	Discrete pool in emerging market.	Tribasa Toll roads	Mexico
	Limited recourse financing for water and environmental project. Indexed project revenues to inflation.	Chihuahua Norte Municipal Wastewater Treatment Plant	Chihuahua, Mexico

(Table continues next page.)

TABLE A2.6 (CONTINUED)
Capital market innovations, 1991–96

Year	*Capital Market Innovation*	*Project*	*Project Location/ Country of Origin*
1995	Privately financed undersea telecommunications cable. 18-country political risk package.	Fiberoptic Link Around the Globe (FLAG)	23 political jurisdictions between the United Kingdom and Japan
	Offering of limited recourse notes in high-yield notes market.	California Energy Co./Salton Sea Funding Corp. Debt Refinancing	United States
	Toll road financing syndicated in the equity and bond markets.	M2 Toll Toad	New South Wales, Australia
	Power transmission and cross-border project with multilateral bank guarantees.	Líneas de Transmisión del Litoral S.A.	Argentina; Paraguay
	Emerging market debt issue exceeded sovereign debt rating ceiling. Notes secured with a portion of future receivables through long-term oil purchase agreement.	YPF Structured Export Notes Private Placement	Argentina
	Debt fund established. Used multilateral bank guarantees to fund IPP.	Hub River Power Project	Pakistan
1996	Capital market refinancing in an emerging market.	Pehuenche Bond Offering	Chile
	Precompletion financing obtained by emerging market without political risk insurance, multilateral bank support or PPA.	Ibener Power Project	Chile
	Latin American company to enter U.S. 100-year bond market.	Endesa 3-Tranche Bond Offering.	Chile
	Long-term refinancing of project finance with investment grade.	Paiton Energy Co. Bond Offering	Indonesia
	Latin American municipality syndicated loan.	Bogotá Syndicated Loan	Colombia
	Toll road financing syndication in the equity bond market by a local government entity within an emerging market.	Guangdong Provincial Expressway Shareholding	Guangdong Province, China
	Municipal government financing of greenfield toll road.	Linha Amerela	Rio de Janeiro, Brazil

Source: Inter-American Development Bank 1995; Vives 1997.

Comments on "Government Support to Private Infrastructure Projects in Emerging Markets"

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The objective of attracting private investment in infrastructure projects is not just to obtain the financial resources but to ensure economically efficient development of the sector. This requires an economic climate that reduces both political and regulatory risk, ideally not by providing guarantees but by establishing a stable political and economic climate, good regulatory bodies, independent judicial systems, and a regulatory framework that promotes economic efficiency. As many of these factors are not present in developing countries, government guarantees could serve as "second-best" instruments. In such cases, guarantees should be consistent with the objective of promoting economic efficiency.

Chile has succeeded in attracting large amounts of private investment in infrastructure, generally without providing explicit government guarantees. Of the $18 billion that Chile is expecting to invest in infrastructure during the next six years, 70 percent may come from private sources. The telecommunications and energy enterprises have been privatized without the need for any guarantees. In both cases competitive regulatory frameworks have turned over responsibility for planning, investment, and operations to the privatized companies. The companies themselves decide how to design projects, estimate demands, fix prices (except for the regulated services), and negotiate with financial institutions. The water and sanitation sector is expected to be privatized soon, without the need for guarantees.

An exception to the rule of not providing government guarantees exists in the highway and transport sector. In Chile private investment in the sector has reached $1.5 billion in only a few years and is expected to reach $4 billion soon. Here the government has guaranteed a minimum level of tariff revenues that can cover up to 70 percent of estimated project costs. The guarantee is provided because government decisions in the future can have a large impact on the sector. The profitability of a road depends crucially on the decision to build or commission other roads or to develop alternate forms of transport such as railroads. An open competitive market is very difficult to establish in such markets.

Where such guarantees are provided, contracts must be carefully designed to ensure that they continue to provide incentives for the efficient economic development of the sector. The greater challenge is to reach the stage at which the private sector plays an important role in development planning of the sector within a competitive framework, with various concessionaires and competing transport systems.

Natural gas provides an interesting example of the evolving participation of the private sector. Although the idea of a gas pipeline between Chile and Argentina had been around for a long time, political, technical, and economic problems prevented the pipeline from being built. In 1991 a binational protocol agreement allowed the private and public compa-

nies in both countries to negotiate contracts directly for the transport and sale of gas. However, an export limit of 5 million cubic meters a day was established, and the project advanced slowly as a consortium of public and private companies proposed export licensing rules and a regulatory framework, which included the possibility of government guarantees and exclusive concessions.

The situation changed dramatically in 1995, following the deregulation and privatization of the gas sector in Argentina, when both governments agreed to modify the protocol agreement to remove export restrictions and allow free entry into the pipeline sector under a policy of "open access." This led to fierce competition between two consortia planning alternative projects until one of them succeeded in signing up sufficient contracts and began construction. The project will soon be supplying natural gas to Santiago and its environs. At present, new pipelines and gas distribution systems are being developed, and $3 billion of fully private projects in the gas sector are under execution. This experience shows that it is possible to construct binational infrastructure projects privately, within a competitive framework and without the need for government guarantees.

Chile's experience in electricity, telecommunications, and natural gas shows that the private sector is able both to finance projects and to carry out planning activities and manage commercial risks. Where the regulatory framework is poor or nonexistent or where government decisions can fundamentally affect project profitability, government guarantees can be used as a complementary instrument to attract private investment. In such cases it is essential to ensure that contracts are well designed, do not adversely affect the economic efficiency of the project, and do not hamper subsequent structural reform.

Jose W. Fernandez, O'Melveny & Myers LLP, New York

The need for increased infrastructure spending in developing countries is great. As private capital can meet only a portion of the funding needs, countries compete to attract private investors. This has prompted Latin American nations to attempt to outdo their neighbors by offering foreign investors incentives—in addition to government guarantees—such as tax breaks, assumption of a privatized company's debt, partial funding of needed investments, and stabilization clauses that specify compensation for changes in laws or regulations that affect the infrastructure provider adversely. The legal validity of stability clauses has been questioned, since freezing the applicable law at the date of contracting could be interpreted as an attempt to restrict the sovereign power of a state, which a state cannot waive.

Because privatization often results in increased user fees—which are politically less palatable than having taxpayers subsidize the service—investors often prefer incentives to higher fees. But it is important to keep in mind that guarantees and higher user fees are only two of several options to attract foreign investment to infrastructure projects. Other options include lengthening the term of the concession, increasing the exclusivity period, and lowering the expansion and service requirements.

3

Covering Political and Regulatory Risks: Issues and Options for Private Infrastructure Arrangements

Warrick Smith

Abstract

Uncertainty over future government action has long been recognized as an impediment to private investment. The issue becomes particularly acute in infrastructure for several reasons. Infrastructure investments are typically large, long-term, and irreversible, and they are usually dependent on sales to domestic rather than export markets. Basic infrastructure services tend to be widely consumed in the community and are often considered "essential." There are no votes to be gained by increasing infrastructure tariffs, and governments face pressures to intervene in pricing and other matters to advance short-term political objectives. Monopoly characteristics of many infrastructure projects mean that such investments are subject to political scrutiny, particularly when foreign investors are involved. Government involvement is also heavier in these sectors, through regulation of entry, prices, and other parameters and, in some cases, public ownership of key suppliers to, or customers of, private projects. Taken together these factors can expose infrastructure investments to considerable political and regulatory risks that, if not addressed effectively, will deter investors or increase the risk premia they demand.

The central challenge can be stated simply. Governments highly value the flexibility to adjust policies to changing priorities and conditions. Without this flexibility governments could not fulfill their responsibilities in an increasingly dynamic world. But the potential for governments to change the rules exposes investors to risk, including the risk that their property or profits will be expropriated by government action. To attract investment at reasonable cost, governments must make credible commitments to rules that safeguard property rights (Williamson 1985; Levy and Spiller 1996).

Most industrial countries have been able to demonstrate this commitment through relatively long track records of respecting property rights, supported by independent judiciaries and other institutions that keep opportunistic government behavior in check. Most developing countries have much shorter track records in this area, and many have encroached on property rights in the not too distant past through nationalization and similar measures. Many developing countries are still in the process of establishing independent judicial systems and other safeguards against opportunistic government action. In this environment, governments and investors are struggling with the challenge of establishing the commitments required to induce investment at reasonable cost, without unduly hampering government flexibility, distorting incentives for efficiency, or exposing consumers or taxpayers to unnecessary costs or liabilities.

Various strategies and instruments are available for managing political and regulatory risks. The strengths and limitations of each are reviewed, taking into account the perspective not only of investors but also of the host governments and the taxpayers and consumers they represent.

▼ ▼ ▼

As long as governments are responsive to popular will and changing circumstances, investors will face the prospect of uncertain government action. The challenge is to define strategies and mechanisms that reduce those risks to acceptable levels while ensuring incentives for efficiency.

This chapter examines the instruments and strategies available for dealing with political and regulatory risks in privately financed infrastructure projects. The first section considers the nature of political and regulatory risks and suggests a simple taxonomy for discussing particular categories of risk relevant to private infrastructure arrangements. The second section reviews a range of "self-help" measures—options available to governments and investors for dealing with these risks without relying on intergovernmental commitments, insurance, or third-party guarantees. The third section examines the role of intergovernmental commitments, including the recent growth in international treaty-making relevant to the protection of investment. The fourth section looks at the role, operation, and limits of political risk insurance offered by multilateral agencies, national governments, and the private sector. The fifth section reviews similar issues relating to guarantees issued by sovereign governments and multilateral development banks. The last section outlines the more promising strategies for dealing with particular risks, and suggests a direction for future work in this area.

CHARACTERIZING AND EVALUATING RISKS

Much confusion surrounds the definition and analysis of political and related risks.[1] An abundance of conflicting definitions of "political risk" and "regulatory risk" exist, and even more concrete notions, such as "expropriation," are not consistently defined. Nonperformance by government-owned enterprises can also be characterized in various ways. So what are we talking about?

In principle, political and regulatory risks should be differentiated from conventional commercial risks that arise because of uncertainties about future changes in cost, demand, and competition in the marketplace. Action by government or its agents must be the proximate cause of the risk. In practice, however, events often have multiple causes or origins, and perceptions of the role and responsibility of government can differ. Government policy actions, for example, can depress economic growth and hence demand for a particular service. Losses may be incurred because of terrorism that might have been avoided by greater vigilance by the government. Contractual nonperformance by a government-owned enterprise may result from managerial incompetence rather than from political direction. Where is the line to be drawn?

It is beyond the scope of this chapter to propose comprehensive definitions in this area. Instead, the focus is on three categories of risk that typically lie at the heart of debates over risk reduction and management in private infrastructure arrangements:

- *Traditional political risks:* risks relating to expropriation, currency convertibility and transferability, and political violence.
- *Regulatory risks:* risks arising from the application and enforcement of regulatory rules, both at the economywide and the industry- or project-specific level, including rules contained in contracts with governments, in laws, and in other regulatory instruments.
- *Quasi-commercial risks:* risks of contractual nonperformance by the government or government entities in their capacity as suppliers to or purchasers from private infrastructure projects.

Traditional Political Risks

Certain government-related risks apply to all investments and are not unique to infrastructure. These include the risks of expropriation, currency convertibility and transferability, and political violence.

Expropriation

Expropriation risk is the risk that the host government will nationalize the assets or equity of an enterprise in an arbitrary or discriminatory manner or without paying fair compensation. Expropriation may be the result of a single governmental act or a series of acts

designed to force shareholders to abandon the project ("creeping expropriation"). In either case the action reflects deliberate public policy.

While the risk of expropriation is not unique to infrastructure, infrastructure investments may be more vulnerable than investments in sectors such as manufacturing. Particularly if there has been a long history of state ownership and subsidized prices, the transition to private sector provision and cost-covering tariffs may attract close scrutiny and controversy, especially if the project enjoys monopoly privileges. Infrastructure assets may also be particularly vulnerable because of their specific and immobile character: it is rarely feasible to convert an infrastructure asset to an alternative use or to move it to another jurisdiction in response to adverse changes in the political climate.

Numerous models have been developed for forecasting the likelihood of expropriation and similar actions (see Chermak 1992). In practice, however, investors tend to rely on more subjective judgments. Sources of optimism include the growing global consensus in favor of private ownership and more liberal economic policies, the growing appreciation by governments of their reliance on international capital, and the time that has elapsed since the last major wave of expropriations. But the socio-cultural, political, and economic phenomena that affect risks of this kind are impossible to predict, particularly over the long time horizons usually involved with major infrastructure investments (see Wells and Gleason 1995).

Risks can vary according to the infrastructure activity and ownership structure in question. Investments that supply the public directly—such as power, gas and water distribution, and toll roads—are more visible, and hence more likely to attract political attention than wholesale activities, such as power generation, gas transmission pipelines, and water treatment plants. Foreign rather than local private involvement will also usually increase the likelihood of political attention and hence the risk of adverse government action.

It is generally accepted that governments do not have an unqualified right to expropriate or nationalize assets, and that they should provide appropriate compensation when they do so. This principle forms the cornerstone of international law in this area and is increasingly reflected in national constitutions. From a policy perspective the challenge is primarily one of ensuring that governments respect this principle and that it is institutionalized in a way that provides assurance to investors. At a broader level the challenge is to devise ways to tame the political forces that can make infrastructure investments particularly vulnerable. As discussed below, there are many promising developments in this area, including the shift toward more competitive market structures, efforts to enlist broader popular participation in infrastructure ownership, and greater attention to public education.

Currency Convertibility and Transferability

Convertibility risk is the risk that investors will not be able to convert local currency revenues into the foreign exchange required to make debt service and other foreign currency payments or that they will have to convert at penal or artificially low exchange rates. Conversion may be blocked actively (by the imposition of exchange controls) or passively (by the central bank lacking the foreign exchange to effect the remittance). Transferability risk is the risk that the central bank of the host country will restrict the transfer of foreign currency out of the country. Both risks may result from deliberate policy actions or by failure to maintain sound macroeconomic policies. The impact of these risks will depend on the nature and financial structure of the investment and the government's broader policy framework.

While all investments are subject to these risks, infrastructure investments may be particularly vulnerable if prices are denominated in local currencies, while financing or other obligations must be met in a foreign currency. Thus, for example, ports, airports, or export-oriented projects that can recover payments in foreign currency are less vulnerable than water or power distribution projects that collect tariffs only in local currency. Similarly, projects that can be financed and supplied primarily from local sources will be less vulnerable than projects with substantial foreign borrowings or needs for imported equipment or other project inputs.

The key policy variable, however, is government macroeconomic policy. The global shift toward

market-oriented exchange regimes overseen by autonomous central banks is doing much to reduce risks in this area. Increasingly, governments understand the benefits of letting macroeconomic imbalances be addressed through exchange rate movements rather than attempting to control capital and currency flows at artificial exchange rates. International treaties increasingly underscore this by requiring unrestricted transfer.

Political Violence

War, revolution, insurrection, civil strife, terrorism, or sabotage can interrupt or terminate an investment's profitable operation. In some cases these events may result from deliberate policy actions by the host government. In most cases, however, they flow from the government's inability to maintain law and order.

While political violence may affect any investment, infrastructure investments that are perceived as "strategic" assets may be particularly vulnerable. In some cases disaffected groups may view assets operated by foreign investors as particularly attractive targets.

With rare exceptions governments seek to reduce the incidence and impact of political violence within their borders. The issue is thus usually one of capacity rather than of will. The key policy question is to what extent a government should be held responsible for acts beyond its full control. Developing international law generally requires only that the government exercise "due diligence" in protecting foreign investments, rather than imposing strict liability to compensate for all losses. In countries with a history of problems in this area, governments may be asked to make much more specific commitments in their contracts with investors.

BOX 3.1

Measuring political and regulatory risk

Political and regulatory risks can deter investors, increase the cost of investment capital, increase required tariffs, and/or reduce the proceeds from privatization. To date, however, no fully satisfactory method exists for measuring the impact of particular risks on costs and prices to give policymakers more precise guidance on the potential benefits of reforms or the tradeoffs involved in the design of particular transactions or regulatory regimes.

At the countrywide level, most risk indexes rely on subjective assessments to rank countries relative to other countries (for example, see box 3.7). With greenfield projects and privatizations, inferences can be drawn from bond ratings and bid prices received from investors, although these measures will inevitably reflect a range of other relevant factors. Sometimes, however, the message is stark. When Hungary attempted to privatize its energy sector in 1993 without fully defining the regulatory system, for example, the few bids received ranged from just 6 to 60 percent of the book value of the enterprises, forcing the government to call off the sale. Two years later, with a more detailed regulatory regime in place, a second privatization attempt realized proceeds of nearly $2 billion. Even then residual gaps in the regulatory framework reportedly led many investors to reduce their bids or not to bid at all.

Given the difficulty of isolating particular variables and counterfactuals, one way of looking at the impact of political and regulatory risk is to consider how much investors and lenders would be willing to pay for insurance against these risks. Although there are gaps in the coverage of political and regulatory risk insurance and a number of factors affect pricing, private insurance against traditional political risks and breach of contract can cost as much as 7.5 percent a year on the amount insured (see table 3.4).

Recent efforts have tried to analyze more systematically the impact of certain regulatory system design choices on regulatory risks and hence the cost of capital. One approach has been to draw inferences from the bond ratings of utilities subject to different regulatory systems. In the United States, for example, studies have shown that having regulators elected, rather than appointed, significantly increases the probability that a utility will receive a lower bond rating. These studies acknowledge, however, that it is impossible to isolate one variable from other factors and that bond ratings themselves reflect subjective judgments (see Formby, Mishra, and Thistle 1995).

Another approach is to look at the betas (which measure the extent to which a firm's returns vary relative to those of a diversified portfolio of equity holdings) of firms operating under different regulatory systems. The higher the beta, the larger the increase in the riskiness of the investor's portfolio and the higher the cost of capital. One recent study (Alexander, Mayer, and Weeds 1996) examined the asset betas of utilities in several countries and found that price cap regulation was associated with higher betas, and thus greater risk, than rate of return regulation. The study suggests that the difference in regulatory approach could amount to a difference of as much as 1 percentage point in a firms' cost of capital.

Regulatory Risks

All governments manage social and economic activity by defining the rights and obligations of private and public agents through laws and regulations. Governments may use their police powers to respond to perceived market failures, to advance particular social or political goals, and to raise revenue through taxation.

Risks flowing from regulatory action are not confined to developing countries. Indeed, all regulatory systems create risks of some kind and to some degree.[2] In developing countries, however, the absence of a long track record in regulating private firms fairly coupled with underdeveloped institutional safeguards against opportunistic government behavior can create greater concerns for investors. (On the measurement of regulatory and political risk, see box 3.1.)

Regulatory interventions can be characterized in many ways. One useful distinction is between laws and regulations that are economywide in their scope and application and those that are specific to the industry or project in question.

Economywide Laws and Regulations

Economywide laws and regulations governing foreign investment, taxation, labor, immigration, antitrust, environmental protection, securities, or a raft of other matters can be administered or changed in ways that adversely affect the profitable operation of an investment. If ostensibly economywide measures are in fact targeted at an enterprise through discriminatory application, they may constitute "creeping expropriation."

In all societies economywide rules are in a constant state of evolution as governments respond to changing perceptions of the public interest. In most countries the trend is toward more targeted and sophisticated regulation of business activity, which may increase the security of private property rights while sometimes adding to business costs in other ways. For example, modernization of antitrust, intellectual property, and environmental regulations may benefit many enterprises (and society as a whole) while adding to the operating costs of other firms.

In most competitive markets firms can adapt to regulation-induced changes to their cost and operating conditions through their investment decisions and by passing cost increases on to consumers through higher prices. In infrastructure industries, however, decisions to invest in particular locations or technologies are difficult to modify, and price regulation can limit the ability of firms to pass regulation-induced costs on to consumers. For these reasons investors in infrastructure are particularly sensitive to the link between economywide laws and regulations and the project- or industry-specific frameworks under which they operate. Taxes, environmental laws, and import/export restrictions usually rank high on their list of priorities.

Investors in infrastructure have an interest in a stable business environment, particularly insofar as it affects the costs of performing regulated activities. But exempting infrastructure enterprises from all changes in law or policy for what is often more than twenty years would create problems for government. Such a strategy would reduce the effectiveness of policy adjustment in large and important sectors of the economy, distort investment and operating decisions, and lead to claims of inequity from firms that are not similarly sheltered from policy changes. The main policy question, then, is to what extent project- or industry-specific regulatory frameworks should take these economywide regulatory developments into account, such as by "stabilizing" particular taxation and other norms prevailing at the time the investment is made, or creating mechanisms that allow regulation-induced cost increases to be passed on to consumers through higher prices. International experience varies widely, not only between countries but also between sectors and over time.

Industry- and Project-Specific Regulatory Frameworks

Infrastructure activities are usually subject to detailed industry- or project-specific regulation in response to various objectives. These may include control of prices and service quality standards to deal with potential abuse of market power in monopolistic activities and control of other parameters to deal with environmental, public health, and safety concerns. Regulatory barriers to entry may be erected to meet a

range of objectives, including the creation of monopoly rents for redistribution through cross-subsidies to favored groups or for other purposes. Regulatory frameworks of this kind may be expressed in laws, decrees, licenses, or contracts, as well as in the decisions of regulatory authorities.

At the broadest level this risk arises from uncertainty over how the government will exercise its regulatory authority over the investment to control entry, prices, profits, or other parameters. Depending on the design characteristics of the regulatory framework in question, this risk might encompass one or more of three actions: exercising any discretion reserved to the government by law or contract in a manner unfavorable to the investor; changing laws or other unilateral regulatory instruments in a manner unfavorable to the investor; and repudiating a specific contractual commitment on regulatory issues. These actions may be motivated by governmental opportunism or by good faith efforts to maintain a reasonable balance between competing interests in long-term arrangements of importance to society.

The industry- or project-specific regulatory framework applied to an infrastructure enterprise reflects a balance of the interests of investors, consumers, and other stakeholders. A proper evaluation of the risks involved depends on judgments on three main issues: the social and political climate affecting the activity in question; the likely need for adaptation during the life of the arrangement; and the design characteristics of the framework in question.

Social and political climate affecting the activity in question. The social and political climate affecting an infrastructure investment varies across countries and activities, as well as over time. History has shown that tariffs for infrastructure firms that supply the public directly—such as water, electricity and gas distribution, telecommunications services, and toll roads—are "political" (box 3.2). Politicians are loathe to raise prices of services that are widely consumed and often considered essential, and face pressures to use regulation to mandate service delivery at prices that do not cover costs. The same pressures may be more attenuated for infrastructure enterprises that supply the public only indirectly—such as power generation projects or water treatment plants that sell to distribution entities—but concerns over "excess" profits can still trigger political controversy. This has been described as the "infrastructure paradox": high political risks require infrastructure investments to command high returns, but high returns exacerbate the risk of unfavorable political attention (see Wells and Gleason 1995).

The type of infrastructure services can also make a difference. Tariffs for telecommunications services, for example, may be less sensitive than tariffs for urban water supply, because access to water has implications for public health and is sometimes perceived as a "right" of all citizens. Another key variable is the expectations of users: if prices have a history of heavy subsidization under public ownership, rapid transition to full cost-covering tariffs under private ownership is likely to attract greater popular resistance, particularly if price increases are not accompanied by early and visible improvements in quality of service.

Pressures for adaptation during the life of the arrangement. Infrastructure investments often last twenty years or longer. At the time the initial arrange-

BOX 3.2

Political pressures and toll road tariffs in Bangkok

The political economy of infrastructure regulation can create strong pressures on governments to renege on regulatory undertakings to private firms. The experience of a Bangkok toll road illustrates the pressures that are common in most infrastructure investments that supply the public directly.

To help relieve heavy traffic congestion around central Bangkok, the Thai government awarded a contract for a twelve-mile, six-lane private toll road to Bangkok Expressway Company Ltd. (BECL). The build-operate-transfer contract specified a toll of about 30 Baht ($1.20). As the project neared completion the government became concerned about popular reaction to the agreed tariff and proposed a new tariff of 20 Baht. The operator insisted on delaying the scheduled opening of the road until this and other contract disputes were settled. The government responded by obtaining an order from a local court requiring the road to be opened to traffic. When the deadline set by the court passed without any action by BECL, the government began operating the toll road unilaterally. This expropriation forced BECL to the verge of bankruptcy.

ment is concluded, it is impossible for the parties to predict all contingencies that may arise during this period or estimate their impact on the balance of benefits in the relationship. The initial arrangement may prove inadequate to deal with changing demand or cost conditions or technological innovations. Anticipated investment requirements may prove to be under- or overestimated. Service quality parameters may need to be adjusted to meet the evolving expectations or preferences of consumers. And pricing provisions that were considered reasonable at the time of concluding the initial arrangement may, over time, be considered as excessively generous to one party or the other.

Pressures for adjustment are common to all long-term infrastructure arrangements, although different infrastructure industries and activities can be affected differently. It is typically more difficult to estimate the investment and maintenance needs of underground assets in a water concession than it is to forecast the construction and operating costs of a power generation project, for example (on water, see box 3.3). It is also typically more difficult to forecast future demand for a greenfield toll road than for an established power distribution company. Forecasting developments in technology-intensive activities such as telecommunications is particularly difficult.

Progress in technology and economic thinking can be another source of pressure for adaptation. The recent drive for more competitive approaches to infrastructure delivery is encouraging governments around the world to remove regulatory barriers to market entry, including those that benefit private investors (see box 3.4). Governments are also moving away from traditional rate-of-return profit regulation toward methodologies that provide firms with stronger incentives for efficiency.

Design characteristics of the regulatory framework. The tensions between providing commitments to investors to reduce financing costs and maintaining the flexibility to adapt to changes during the life of the regulatory arrangement will be reflected in the design of the regulatory framework. The main variables can be illustrated by considering a rule governing prices for infrastructure services.

BOX 3.3
Managing a long-term water concession in Buenos Aires

Pressure to amend or modify industry- or project-specific regulatory frameworks can come from inadequate information on the investment at the time the initial arrangement is concluded or from changing social requirements. The concession awarded for the water and sewerage system in Buenos Aires illustrates some of the challenges.

In 1993 a thirty-year concession was granted to a private company to provide water and sewerage services in greater Buenos Aires, covering a population of some 12 million people. Before the concession was granted extensive studies were undertaken on the investment and maintenance needs of the system, including the development of a detailed investment program. Tariffs were to be adjusted at five-year intervals to provide incentives for the investor to reduce costs. After a competitive process, the concession was awarded to a firm that undertook to provide services at prices nearly 30 percent below those of the previous government-owned operator.

Despite the efforts to create a stable framework with adjustments limited to every five years, modifications to tariffs and investment levels were implemented within thirteen months of commencement of the concession. The arrangement remains under pressure for further adjustment to accommodate the interests of both parties.

BOX 3.4
Changing the rules to increase competition

Pressures to modify industry- or project-specific regulatory frameworks can come from advances in technology and economic thinking, including growing efforts to reap the benefits of competition. In some cases this may involve changing rules that have sheltered private investors from competition.

Singapore partially privatized its national telecommunications carrier in 1993. The prospectus indicated that the company would enjoy exclusivity until 2007. In 1996, however, the government decided to shorten the exclusivity period to 2000 to bring the benefits of competition forward. As compensation for revising the rules, the government paid the company S$1.5 billion ($1 billion).

The United States is currently struggling with the transition from traditional monopoly power franchises to more competitive market arrangements. A key issue is whether private shareholders in assets that are "stranded" by reforms should receive compensation, and if so, how much and from whom. In many cases, the proposed solution is to pass these "transition" costs on to consumers through higher tariffs.

- *Specificity of the rule.* Pricing rules can range from vague commitments to maintain "just and reasonable" or "fair" prices to much more precise rules specifying detailed price adjustment formulas and possibly even a specific rate of return. U.S. laws illustrate the first approach, while laws in Chile and Peru more closely resemble the second approach. The United Kingdom has adopted an intermediate approach, with prices adjusted in accordance with a list of factors.
- *Safeguards against misuse of discretion.* When discretion has been reserved over the interpretation or application of a pricing rule, the safeguards against misuse of that discretion will be important. Given the political economy of infrastructure regulation, entrusting discretion to a political authority will usually create greater risk for investors than entrusting it to a more independent entity. Independent regulatory agencies have a long history in the U.S. and have become a hallmark of modern infrastructure reforms around the world. The design features of the agency are themselves important, as the degree of insulation from populist pressures can affect perceptions of risk and hence the cost of capital.[3]
- *Safeguards against unilateral amendment of rule.* Highly specified rules that entrust residual discretion to an independent regulatory agency will provide little comfort if the rules can easily be changed without the investor's consent. If a rule is expressed in a public law instrument such as a statute or decree, the ease of unilateral amendment will depend on its place in the hierarchy of norms in each legal system. For example, amendments to rules contained in constitutions usually require special processes, such as super-majorities in the congress; amendments to laws require the involvement of the legislative and executive branches; and amendments to decrees or similar instruments can often be made by the executive branch (and sometimes a single minister) acting alone. Weak constraints on amendment give the government greater flexibility but reduce the assurance provided to investors.

  Rules embedded in contracts usually cannot be modified without the consent of both parties and can thus provide investors with a higher degree of certainty than laws. But not all contracts have this characteristic: some civil law countries have adopted an approach that permits unilateral revision by the government party in some circumstances (see box 3.5).

  International practice in this area varies. The United States relies on broad standards established in its Constitution to condition lawmaking and decisions by regulatory agencies (see box 3.8). The United Kingdom relies on licenses that can be amended without the consent of the investor in some circumstances, subject to a statutory requirement that the investor is able to finance the investment. Chile and Peru rely heavily on detailed legislation, often supplemented by contracts that attempt to stabilize the legislative scheme.
- *Enforcing compliance.* Even if the rule in question is specific and immutable, it will be of little value to the investor if the government can ignore it with impunity. There are two main issues. First, if local courts are responsible for enforcement, they may not be entirely objective in assessing claims against the government, particularly if foreign investors are involved. Concerns of this kind are usually exacerbated when the country in question lacks a well-established tradition of judicial independence. For this reason investors often prefer

BOX 3.5

Unilateral modification of concession contracts for public services

In common law countries such as the United Kingdom and United States contracts can be modified only with the consent of both parties. Provided that the language is clear and there is an effective enforcement mechanism, contracts can thus provide investors with a high degree of security.

Some Latin American countries, in contrast, have adopted principles of French administrative law that allow the government party to unilaterally interpret or modify the terms of concession contracts for the provision of public services. In Colombia, for example, a public authority can unilaterally interpret or modify a contract if it is considered necessary to prevent the service from being "paralyzed or seriously affected," as long as the financial–economic equilibrium of the initial contract is maintained and the contractor can withdraw if the modifications alter the value of the initial contract by 20 percent or more (see Law 80 of 1993).

that contractual disputes be subject to arbitration in a neutral country. Second, even if a court judgment or arbitral award is made in favor of the investor, effective compensation must be obtained. Enforcement of a foreign arbitral award usually requires that the government be party to a relevant international convention. But even where an effective enforcement mechanism exists, the responsible government entity may lack the financial resources to pay compensation.

Tradeoffs in responding to industry- or project-specific regulatory risks. Industry- or project-specific regulatory frameworks need to strike a balance between three main goals: inducing investment at a reasonable cost of capital; providing incentives for efficiency in investment and operation; and providing flexibility to adapt to changing conditions and circumstances.

If the sole concern were to reduce the cost of investment capital, regulatory risk could be reduced by governments entering into arrangements with highly specified rules embedded in contracts that could not be amended unilaterally. To provide maximum protection for the investor, the contract would grant the investor a monopoly and define tariff adjustment rules according to a formula that ensures a prespecified rate of return. If the contract were subject to an effective enforcement mechanism, such as international arbitration, this approach could provide investors with a high degree of confidence and thus reduce the cost of investment capital.

But such an approach has important shortcomings. Defining price regulation by reference to rate-of-return methodology provides poor incentives for the investor to minimize costs and creates incentives to overinvest in capital relative to other factors of production.[4] Committing to a specific rate of return is also problematic, as the level of return required to induce efficient investment will likely change over the life of the contract. A perception of a high level of risk at the time the contract is concluded may require a relatively high rate of return, which may prove out of line with market requirements once the risk environment improves. If the initial level of return remains unchanged, incentives for efficient investment in the economy will be distorted and consumer resentment may create pressures for the government to renege. A monopoly also provides weak incentives for efficiency, increases the burden on regulation, and can intensify political scrutiny. Other parameters of the contract may also need to be adjusted to take account of unforeseen and unforeseeable events or to fine-tune application of the arrangement. Taken to the extreme, highly specified contractual approaches will lack credibility: both parties to the transaction will understand that the arrangement is unsustainable in light of evolving conditions and will assess their risks accordingly. The focus will then be on safeguards in the inevitable event of renegotiation.[5]

The optimal balance between specificity and rigidity on the one hand and flexibility and discretion on the other will depend on three factors:

- *Risk environment.* The greater the level of perceived risk, the greater the need to make very specific and rigid commitments to attract investors. Many developing countries have thus had to commit to very specific rules set out in laws and contracts, while the United States has been able to maintain much greater flexibility.
- *Policy priorities.* When the primary goal is to induce new investment, governments may be less concerned about maintaining the flexibility to pursue efficiency or other goals. When the primary goal is to ensure that existing assets operate more efficiently, however, more emphasis will be placed on the incentive effects of particular rules and hence on maintaining more flexibility. Similarly, if a government wishes to preserve the prerogative to fine-tune the rules, it may be prepared to pay a higher price (in terms of the cost of capital) to maintain this flexibility.
- *Type of infrastructure investment.* More specific contractual approaches tend to be the norm for major greenfield developments, particularly at the wholesale level, such as independent power projects. This is because project sponsors usually need much greater certainty to obtain limited-recourse financing; the economics of the project are relatively easy to predict; and selling to a single customer rather than to retail customers in general reduces the need to deal with adjustments to tariff structure and service quality issues and also reduces the risk of con-

sumer backlash if returns are perceived to be overly generous. Investments in privatized power or water distribution systems, in contrast, tend to be governed by more flexible arrangements. This is because of greater difficulty in forecasting system investment, maintenance, and operating costs; the need to deal with more complex and evolving tariff structure and service quality issues; and greater proximity to retail consumers and hence pressures for continuing price moderation.

Quasi-Commercial Risks

Many governments still undertake commercial activities, either directly or through government-owned enterprises. In their "commercial" guise, governments and government entities may be suppliers to or customers of private infrastructure firms. In some cases they may be the sole or principal suppliers of essential inputs, the sole or principal consumers of outputs, or both. In the case of independent power projects, for example, government-owned enterprises may be the sole suppliers of fuel and the sole purchasers of bulk power. Similar situations may arise with respect to the provision of land for highway projects, the supply of gas to transmission or distribution networks, and the purchase or supply of bulk water. In a fully privatized economy such supply or purchase risks would usually be regarded as "commercial." However, state ownership or control introduces special performance risks that are often regarded as "political."

Quasi-commercial risk can be defined as uncertainty over the willingness or capacity of governments or government-owned enterprises to meet their contractual obligations as suppliers to or purchasers from private infrastructure projects. Those defaults might arise deliberately, through direct political interference in what would otherwise be commercial dealings, or from the poor creditworthiness of government-owned enterprises that are not operating in a fully commercial manner.

The nature and extent of the risk will depend in large part on the nature of the government entity. When the entity has been "corporatized"—and hence has a commercial charter, autonomous management, and the ability to recover cost-covering prices and borrow in its own right—the supply or purchase risks may approximate those of a private firm. Government entities that lack these attributes will be more susceptible to political interference and are less likely to be creditworthy in their own right. An intermediate case would be a "fully corporatized" government-owned entity that enjoys many of the characteristics of a private firm but is itself subject to an uncertain regulatory framework—such as a power distribution utility whose tariffs must be approved by a minister without reference to any binding criteria.

The ultimate issue is one of enforcing the entity's supply or purchase obligations. As these obligations will be in contractual form, the issues are substantially the same as those discussed with respect to regulatory commitments included in contracts. As quasi-commercial risks often involve entities that lack taxation powers and may be uncreditworthy in their own right, their ability to meet compensation obligations in the event of default is often a key source of risk for their contractual partners.

The weaker the separation between the government and the supplier or purchaser, the greater the potential for political interference and hence the stronger the case for treating performance risks as a responsibility of government rather than as a normal commercial risk. The surest way to achieve an effective separation is to privatize the supplier or purchaser under a credible regulatory framework. Until this is done the main policy challenge is to deal with risks of nonperformance without distorting incentives for efficiency or exposing users or taxpayers to unnecessary costs or liabilities.

SELF-HELP STRATEGIES

A growing range of instruments has been developed to deal with political and regulatory risks, including international treaties, insurance, and third-party guarantees. Before considering those instruments in detail, this section examines some broader "self-help" strategies that governments and investors, acting alone or together, can adopt to reduce risks and hence the need for such instruments.

BOX 3.6
Allocating political and regulatory risks

It is widely accepted that risks should be borne by the party best able to control the risk or able to bear the risk at lowest cost. As political and regulatory risks emanate from government action, it seems easy to conclude that these risks should be borne by governments, and hence by their taxpayers. After all, taxpayers are the presumed beneficiaries of governmental action, and, at least in democratic systems, they have a mechanism for expressing their policy preferences and holding governments to account. In practice, however, matters can be more complicated.

In some cases, the risk may be transferred to consumers, rather than to taxpayers, such as when regulatory rules allow changes in taxation, environmental standards, or other policy requirements to be passed on to consumers through tariff adjustments. The efficiency and distributional implications of the choice will depend on many factors, including the extent to which consumers are coextensive with taxpayers and the relative efficiency of the taxation system and the infrastructure tariff system. The implications for the incentives needed for governments to behave reasonably will also depend on the nature of the political system and on the transparency of the liabilities assumed by taxpayers and consumers.

Moreover, allocating political or regulatory risks to investors (and hence their shareholders) does not leave consumers or taxpayers unaffected. The higher financing and insurance costs investors face will ultimately be reflected in higher tariffs, reduced proceeds from privatization, or greater need for public financing of infrastructure. Reduced profitability can also result in lower tax revenues for the host government and lower returns for local shareholders. And when investors seek cover from national insurance schemes, part of the risk is being borne by the taxpayers of the sponsoring government.

While decisions on the allocation of risks have important efficiency and distributional implications, the real challenge is to reduce risks to a level at which they no longer constitute a significant impediment to private financing of infrastructure. In general, the more stable and predictable the political and regulatory environment in the host country, the less likely that investors will require specific undertakings from government, insurance, guarantees, or other risk mitigation instruments.

Unilateral Government Actions to Enhance Credibility

The first priority for governments should be to establish credibility as respecters of property rights. Most industrial countries have achieved this; many developing countries are still shaking off the legacy of past instability or government opportunism.

With sufficient resolve rapid improvement in investor perceptions—and in economic performance—is possible. For instance, although Chile nationalized foreign investments in the 1970s, by the 1980s it was well on its way to offering the most attractive investment climate in Latin America. Political risk assessments provide one barometer of the pace and direction of similar reforms sweeping the region (see box 3.7).

A common element in most successful turnarounds has been bold policy reform to convince investors and citizens that the government is serious about modernizing the state and is prepared to accept any short-term political pain involved in meeting this goal. Infrastructure privatization is often seen as an early and important part of such reforms, as illustrated by experience in Argentina, Bolivia, Chile, and Peru, and efforts under way in countries such as Brazil, El Salvador, and Guatemala. Governments can enhance the credibility of their undertakings through reforms to core state institutions, including national constitutions, the judiciary, and regulatory institutions.

Constitutional Reform

National constitutions provide the most durable form of rule making in most societies. The U.S. Constitution includes specific constraints on government action affecting property rights, which have been interpreted to provide assurance not only against expropriation without compensation but also against a broader range of government "takings" (see box 3.8). Increasingly, new constitutions in Latin America and elsewhere are including similar constraints on government action. This is an important step toward forging national consensus over the importance of protecting property rights.

Judicial Reform

Constitutional and other legal safeguards of property and contractual rights are of limited value unless they

BOX 3.7

Changing assessments of political risk in Latin America

Euromoney compiles rankings of political risk based on a poll of risk analysts, risk insurance brokers, and bank credit officers, each of whom is asked to rank countries from 0 to 25. A score of 25 indicates no risk of nonpayment; a score of zero indicates no chance of payment. Countries are scored in comparison both with each other and with previous years. Political risk is defined as the risk of nonpayment for goods or services, loans, trade-related finance and dividends, and the nonrepatriation of capital. Comparisons of survey findings in 1992, 1994, and 1996 provide one measure of the impact of reforms sweeping the region.

Country	*1992*	*1994*	*1996*
Chile	14.30	18.46	18.47
Colombia	11.50	15.25	14.42
Uruguay	10.00	12.50	13.75
Mexico	13.70	14.85	12.40
Brazil	7.80	10.85	12.12
Argentina	10.60	12.68	12.06
Paraguay	8.80	10.85	11.48
Bolivia	7.80	10.91	11.18
Costa Rica	10.20	11.79	10.78
Peru	2.70	7.28	10.29
Jamaica	8.00	9.96	10.12
Ecuador	7.60	9.31	9.33
Venezuela	10.20	11.98	9.10
El Salvador	4.80	8.51	8.89
Guatemala	6.10	8.88	8.55

Source: Euromoney Country Risk Indicators, 1992, 1994, and 1996.

BOX 3.8

The role of constitutional constraints: The U.S. experience

National constitutions, coupled with independent judiciaries, can do much to provide investors with assurance against political and regulatory risks. The U.S. experience illustrates the potential.

The U.S. Constitution contains two provisions that protect investors from political and regulatory risks. The Fifth Amendment provides that no private property shall be taken for public use without just compensation; the Fourteenth Amendment provides that states cannot deprive any person of property without due process of law.

The Supreme Court has used these provisions to review the reasonableness of utility regulation since the 1890s. In the seminal 1944 case of *FPC v. Hope,* the Court held that the Constitution protected from regulation "a fair rate of return on used and useful assets," and further provided that the "return to the equity holder should be commensurate with returns in other enterprises having corresponding risks" and "should be sufficient to insure confidence in the financial integrity of the enterprise, so as to maintain its credit and attract capital." More recently, the Court has elaborated on this doctrine by warning states against opportunistic changes in the rules of the game that exposed investors to greater downside risks (see Kolbe, Tye, and Myers 1993).

can be enforced by an independent and reasonably efficient judiciary. In the past the judicial systems of many developing countries failed to meet these tests, with concerns over corruption, politicization, and grotesque inefficiency. As the important links between judicial reform, political risk, and economic development are being recognized, however, many countries have embarked on fundamental—if difficult—reforms in this area (see Rowat, Malik, and Dakolias 1995).

Independent Regulatory Institutions

The move to develop more independent and competent judicial systems has been mirrored by efforts to reduce the influence of short-term political considerations in key regulatory functions performed by the state. Over the last decade or so there has been dramatic progress in establishing independent central banks, competition regulators, and utility regulators in most parts of the world. Independent utility regulators, in particular, have been seen as the most promising strategy for maintaining some flexibility in regulatory frameworks while reducing concerns over regulatory risk. Independent agencies often have greater freedom to recruit and retain highly qualified professionals, which can also contribute to improved regulatory decisions. Creating and sustaining independent regulatory institutions in reforming and developing countries can involve many challenges, however, and in most cases they are entrusted with much more limited discretion than their counterparts in industrial countries (see Smith 1996).

Anchoring Commitments Through Contracts

Contracts between investors and the host government or government entities play a central role in private

infrastructure arrangements. Contracts can be used to define and anchor commitments on a range of issues of concern to investors, including traditional political risks, elements of the regulatory framework, and supply and off-take arrangements with government entities.

Contractual undertakings can take many forms. Explicit undertakings can be provided on compensation for expropriation, delays in currency convertibility and transfer, or losses resulting from political violence. Stabilization clauses can be used to lock in key regulatory and taxation measures at the time the initial arrangement is made. Although clauses of this kind cannot prevent a government from exercising its sovereign rights to change laws and policies, they can establish a right to compensation if the government does make such changes to the detriment of investors (Comeaux and Kinsella 1994). A variation on this approach is to allow any changes in taxation or other regulation-related costs to be passed on to consumers through tariff adjustments.

Contractual undertakings will be of little value if they cannot be enforced. To deal with concerns over possible bias by local courts, the parties can agree to dispute settlement through international arbitration. Governments can agree to waive sovereign immunity to the enforcement of such awards in national courts. And the government's ability to meet compensation claims can be reinforced, if required, by offshore escrow accounts against which any future claims can be deducted.

Care needs to be taken in adopting this strategy for all aspects of the regulatory framework. As discussed in the previous section, tradeoffs often need to be made between providing assurance to investors—and thereby reducing the cost of capital—and maintaining the flexibility to provide incentives for efficiency and to adapt to changing conditions in long-term arrangements. In principle, however, mechanisms for establishing credible commitments exist.

Other Strategies

Governments and investors have also devised a range of other strategies for reducing or managing political and regulatory risks. To different degrees, they involve changing the political economy of private infrastructure provision, giving investors greater bargaining power, or tying the hands of government in some other way.

Increasing Competition

Advances in technology and in economic thinking have created opportunities for increasing competition in many infrastructure activities that were once regarded as "naturally" monopolistic. In addition to increasing efficiency, competitive approaches can reduce political and regulatory risks in several ways. Competition reduces the need for regulatory intervention, and hence the potential for regulation to be misused. And investments in competitive industries are also much less likely to attract political scrutiny than more monopolistic arrangements.

Even when competition is not considered feasible, adopting open and competitive approaches to the awarding of contracts to private investors offers many benefits. In addition to helping ensure the deal is as advantageous as possible to the country, an open competitive bidding process can help reduce concerns over corruption and other improper dealings that can contribute to pressures for renegotiation or even renationalization. In India, for example, the absence of an open competitive bidding process for a major power project was used by a new government as part of its justification for renegotiating the arrangement.

Sequencing Private Investment

The sequencing of private involvement can have important implications for the political and regulatory risks faced by investors. Attracting investment before developing an overall sector strategy and regulatory framework, for example, will expose investors to substantial uncertainty. This in turn will usually require heavier reliance on specific contractual approaches, which, while responsive to the needs of that investor, usually involves other costs and can hinder future sector development.

Attracting private investment in projects before privatizing existing government-owned enterprises in

the sector can also increase risks. This is particularly so when the private firm must compete with the government-owned enterprise, or will be dependent on sales to or purchases from such an enterprise. A growing number of countries are learning the importance of appropriate sequencing of reform in the power sector (see box 3.9).

Involving Local Private Interests

Local private partners can help navigate the local political scene and may be in a position to exercise more influence over government policymaking. More important, governments are less likely to act to the detriment of enterprises if doing so would harm significant local interests, whether they be local elites, local banks, or large sections of the community.[6]

Box 3.9
Sequencing private investment in the power sector

Faced with supply shortages and underperformance by government-owned power utilities, many countries have sought private investment in independent power projects (IPPs) that sell to government-owned utilities. In return for new generation capacity—often constructed quickly and operated at higher levels of efficiency than the government-owned utility—IPPs usually require long-term power purchase agreements (PPAs) with the government-owned utility, typically on take-or-pay terms. In the absence of deeper sector reforms, however, government-owned utilities often fail to cover their full costs through retail tariffs, thus undermining their creditworthiness as contractual partners. Predictably, this leads to demands for sovereign guarantees, higher supply prices to reflect the risks involved, or both. Long-term take-or-pay agreements also complicate later privatization of distribution utilities and the transition toward more competitive power markets.

Reflecting a greater understanding of the weaknesses of this strategy, a growing number of governments are now attacking power sector performance problems at their source—by privatizing distribution utilities under regulatory frameworks that lock in cost-covering tariffs. The privatized distribution utilities are then able to stand behind their own PPAs without sovereign guarantees, and to underpin the development of a competitive power supply market. Similar sequencing issues arise in the water sector, where privatization of water distribution utilities can facilitate private financing of bulk water treatment projects.

The last strategy may involve promoting widespread local ownership, either directly, through, say, local share offerings, or indirectly, through private pension funds. Popular participation arrangements can reduce political resistance to private sector participation and create a strong constituency for maintaining sound sector policies. In this way the ownership structure can help bolster the government's commitments. The privatization programs of a growing number of countries involve elements of this approach. (see box 3.10).

Involving the Host Government or Government Enterprises

It is sometimes suggested that undertaking infrastructure developments as public-private joint ventures may reduce an investor's exposure to political and regulatory risks. This is based partly on the hypothesis that a government may be less likely to prejudice the profitability of an enterprise in which it has a direct commercial stake and partly on the notion that popular resistance to private sector involvement may be reduced.

There are many weaknesses in this strategy, however. The government's roles as owner, operator, and regulator are easily blurred, undermining the credibility of the regulatory framework. When the public sec-

Box 3.10
Buttressing commitments through popular participation in Bolivia

Bolivia's strategy for introducing private investment in infrastructure had a number of novel features. Termed "capitalization," the approach involved transferring 50 percent of the equity and management control over government-owned enterprises to private investors in exchange for new investment commitments. The remaining 50 percent of the shares were transferred to the Bolivian people through a new pension system managed by private firms. Between 1994 and 1996, Bolivia used this technique to transfer government-owned airline, power, telecommunications, railway, and hydrocarbons enterprises to the private sector.

Under the resulting ownership structure, any government action that harms the profitability of the capitalized enterprises will threaten the interests of a large proportion of Bolivia's voters, rather than just foreign investors.

tor partner has substantial involvement in the management of the enterprise, noncommercial objectives can intrude, to the detriment of the private partner and enterprise efficiency. A direct government interest in the firm's profitability may also create incentives to erect or maintain unnecessary monopolies, and it is notoriously difficult to maintain a level playing field if competition is introduced between a public-private joint-venture and a private firm. These concerns are borne out by studies suggesting that public-private joint ventures are more, not less, likely to be subject to expropriation (Moran 1985), and that public-private joint ventures may perform less efficiently even than wholly government-owned enterprises (Boardman and Vining 1989).

Increasing Community Acceptance

Increasingly, investors and governments are working together to curb domestic political concerns that can lead to pressures to renege on regulatory and other commitments. Common measures include educating the public on the benefits of reform and the role of costs in infrastructure prices and structuring privatization programs to bring early and visible benefits to the public. Well-designed subsidy schemes to meet social welfare and rural development objectives can also be important elements of reform strategy.

Increasing Bargaining Power

The bargaining power that the private investor enjoys vis-à-vis the host government will often be an important factor in determining its vulnerability to political and regulatory risks (see Poynter 1993). A "water tight" contract may be part of this approach, giving the investor the threat of suing for compensation if the government reneges on its commitments. But other forms of bargaining power can also be important, including those flowing from control over technology, inputs (including management expertise), and sometimes export markets.

The investor's bargaining power is also affected by the extent to which the investment is irreversible. It is difficult or impossible for an investor to move highways, pipelines, or wire networks to another country in response to adverse changes in the political or regulatory climate. In some cases, however, investors may be able to adopt more mobile technologies. Power plants have been mounted on barges, for example, in a number of developing countries.

Minimizing Equity, Maximizing Debt

It has been suggested that, historically, governments have been more likely to honor debt obligations than equity obligations in the event of a crisis, even if the debt is held by the same parties that own the equity (Wells and Gleason 1995). This points to the advantages of manipulating debt-to-equity ratios to maximize the debt component. This strategy may make equity returns look higher than they might otherwise appear, however, which may itself increase the likelihood of adverse government action. It may also be difficult to reconcile this strategy with involving significant local participation in enterprise ownership.

Diversifying Exposure

Diversification across different countries and perhaps sectors is often a key strategy for investors and lenders in managing their exposure to risks, including political and regulatory risks. Lenders and insurers usually carefully manage their exposure in this way, as do the growing number of international investors in infrastructure projects. The recent development of dedicated infrastructure funds provides a mechanism for investors to diversify risks across projects, sectors, countries and regions (Anayiotos 1994).

Reducing Pay-Back Periods

Forecasting political developments from one month to the next is difficult; forecasting such changes over the twenty or more years often associated with major infrastructure investments is all but impossible. Long pay-back periods can also erode investors' bargaining power flowing from control of technologies, inputs, or expertise. One response to these concerns is for investors and lenders to structure investments with shorter than usual pay-back periods. However, shorter pay-back periods increase the required tariffs or user

fees, making some projects uneconomic and exacerbating the risk of political backlash.

Relying on Bilateral Political Relationships

In some cases political, economic, or security relationships between the host government and the investor's home government may reduce vulnerability to political and related risks. Host governments may be less likely to act opportunistically toward foreign investors if doing so is likely to provoke diplomatic protests or suspension of valued economic or other assistance. For this reason even domestic investors may gain comfort from involvement of nationals of a significant power.[7]

Involving Multilateral Financial Institutions

Participation by multinational financial institutions may also reduce vulnerability to political and regulatory risks. Leaving aside guarantees and other specific instruments, mere participation as a lender or equity investor can help reduce the risk of opportunistic behavior because of the leverage such institutions enjoy over future lending to the country in question, both directly and though their influence with other donors.

INTERGOVERNMENTAL COMMITMENTS

Governments can enhance the credibility of their commitments by entering into intergovernmental agreements, in the form of bilateral, regional, or multilateral treaties. International law is increasingly important in providing basic protections against political and related risks, with a dramatic growth in treaty making relevant to international investment and growing participation to key multilateral conventions. International law establishes important substantive protections relevant to traditional political risks, and it has the potential to do the same with regulatory risks. It also plays an important role in facilitating the settlement of international investment disputes.

Substantive Protections

International law has long grappled with the standards of protection that should be extended to foreign property. Over the past few decades these efforts have been codified, clarified, or extended by international treaties concluded on bilateral and regional bases, and new initiatives are being developed at the multilateral level.

Investment treaties can provide assurance to investors in several ways. First, they constitute an important constraint on signatory states, as few countries will take treaty commitments lightly. Second, should a state breach a treaty commitment, the aggrieved investor's state can pursue its treaty rights against the offending state, often culminating in mandatory international arbitration. Third, an increasing number of treaties allow investors to pursue their treaty rights against the offending state directly, without aid or intervention of their home state. Taken together these measures can do much to ensure compliance with treaty obligations.

Sources of Treaty Protection

Bilateral investment treaties in their modern form date from 1959. More than 1,200 bilateral investment treaties are in place around the world, most of which were concluded in the 1990s. In Latin America, the Calvo Doctrine led to an initial reluctance to enter into investment treaties (box 3.11). By late 1996, however, more than 200 bilateral investment treaties had been signed by countries in the region, led by Argentina, Bolivia, Chile, Peru, and Uruguay.[8]

Although there are differences in the detailed protections provided by each treaty, there is growing convergence in scope and content. In addition to general assurances against discriminatory treatment, the agreements typically include provisions on expropriation and currency convertibility and transferability.

A number of regional agreements incorporate provisions on investment protection. In the Americas these include the North American Free Trade Agreement (NAFTA); the Group of Three Free Trade

BOX 3.11
The Calvo Doctrine

In response to abuses of diplomatic protection of citizens abroad by Western powers in the nineteenth century, Latin American countries put forward the claim that investment regulation in general, and the taking of foreign property in particular, were matters of domestic rather than international jurisdiction. Named after an Argentine jurist of the late nineteenth century, the Calvo Doctrine required foreign investors to waive diplomatic protection of their home state and rights under international law and to rely solely on local remedies. Under the doctrine, foreigners may be treated as favorably as nationals but not more so. The doctrine was widely embraced across Latin America and was reflected in national constitutions and laws, stipulations in investment contracts, and attitudes toward international treaties.

The past decade has seen the demise of the doctrine (Peters and Schrijver 1992). Reflecting the region's integration into the world economy and the aspiration of liberalizing trade and investment within the Western hemisphere, Latin America has embraced broader international rules governing international arbitration and the conclusion of bilateral and regional investment protection agreements. For all intents and purposes the Calvo Doctrine is now defunct.

Agreement signed by Mexico, Colombia, and Venezuela; and two Protocols to Mercosur, the Colonia Protocol, which applies to member countries, and the Buenos Aires Protocol, which applies to nonmember countries. Each of these agreements contains provisions dealing with traditional political risks including expropriation and currency convertibility and transferability, broadly along the lines of bilateral investment treaties.

Efforts to develop a multilateral treaty protecting foreign property date back to 1929.[9] Since 1995 the OECD has been sponsoring negotiations toward a Multilateral Agreement on Investment that would establish multilateral standards on issues currently dealt with in bilateral investment treaties. The Multilateral Agreement on Investment would be a freestanding international treaty open to members and nonmembers of the OECD (OECD 1997). The World Trade Organization is also taking an interest in investment issues, with a possible view to incorporating more investment-related measures within the international regime governing trade in goods and services.

Standards of Protection

Investment treaties deal primarily with traditional political risks, but there is also some limited coverage of regulatory and quasi-commercial risks.

Traditional political risks. It is accepted in international law that states may expropriate foreign investments only if it is done for a public purpose or benefit, in accordance with the law, and with proper compensation. Bilateral investment treaties confirm and elaborate on these standards, usually covering "creeping" expropriation as well.

Most bilateral treaties require that compensation be "prompt, adequate, and effective" and define more detailed standards. The U.S. model agreement provides an illustration:

> Compensation shall be equivalent to the fair market value of the expropriated investment immediately before the expropriatory action was taken or became known, whichever is earlier; be calculated in a freely usable currency on the basis of the prevailing market rate of exchange at that time; be paid without delay; include interest at a commercially reasonable rate from the date of expropriation; be fully realizable; and be freely transferable.

Treaties typically do not elaborate more precise rules governing the calculation of "fair market value." However, World Bank guidelines dealing with this and other issues can facilitate the resolution of disputes (see box 3.12).

Provisions on monetary transfers are among the most important in investment treaties. The trend is toward unrestricted transfer, although some limited qualifications remain, as the terms of the 1991 treaty between the United States and Argentina show:

1. Each party shall permit all transfers related to an investment to be made freely and without delay into and out of its territory. Such transfers include (a)

Box 3.12
Determining compensation for expropriation

In 1992 the World Bank published Guidelines on the Treatment of Foreign Direct Investment to complement the provisions of investment protection treaties (World Bank 1992). The Guidelines do not have the force of law, but they attempt to reflect widely accepted principles to facilitate the resolution of disputes. Guideline IV, on expropriation, includes the following provisions:

4. Determination of the "fair market value" will be acceptable if conducted according to a method agreed by the State and the foreign investor (hereinafter referred to as the parties) or by a tribunal or another body designated by the parties.
5. In the absence of a determination agreed by, or based upon the agreement of, the parties, the fair market value will be acceptable if determined by the State according to reasonable criteria related to the market value of the investment, i.e., in an amount that a willing buyer would normally pay to a willing seller after taking into account the nature of the investment, the circumstances in which it would operate in the future and its specific characteristics, including the period in which it has been in existence, the proportion of tangible assets in the total investment and other relevant factors pertinent to the circumstances of each case.
6. Without implying the exclusive validity of a single standard for the fairness by which compensation is to be determined and as an illustration of the reasonable determination by a State of the market value of the investment under Section 5 above, such determination will be deemed reasonable if conducted as follows:
   (a) for a going concern with a proven record of profitability, on the basis of the discounted cash flow value;
   (b) for an enterprise which, not being a proven going concern, demonstrates lack of profitability, on the basis of the liquidation value;
   (c) for other assets, on the basis of (i) the replacement value or (ii) the book value in case such value has been recently assessed or has been determined as of the date of the taking and can therefore be deemed to represent a reasonable replacement value.

Source: World Bank 1992.

returns; (b) compensation pursuant to Article IV [on expropriation]; (c) payments arising out of an investment dispute; (d) payments made under a contract, including amortization of principal and accrued interest payments made pursuant to a loan agreement directly related to an investment; (e) proceeds from the sale or liquidation of all or any part of an investment; and (f) additional contributions to capital for the maintenance or development of an investment.

2. Except as provided in Article IV paragraph 1, transfers shall be made in a freely usable currency at the prevailing market rate of exchange on the date of transfer with respect to spot transactions in the currency to be transferred. The free transfer shall take place in accordance with the procedures established by each Party; such procedures shall not impair the rights set forth in this treaty.
3. Notwithstanding the provisions of paragraphs 1 and 2, either party may maintain laws and regulations (a) requiring reports of currency transfer; and (b) imposing income taxes by such means as a withholding tax applicable to dividends or other transfers. Furthermore, either Party may protect the rights of creditors, or ensure the satisfaction of judgments in adjudicatory proceedings, through the equitable, nondiscriminatory and good faith application of its law.

Some early bilateral agreements provide a further and limited qualification to deal with temporary and extreme balance of payment situations.[10]

Investment treaties usually offer limited protection against losses caused by political violence. Some treaties require the host government to pay compensation for losses arising from civil strife when the armed forces of the host country requisition the property and when the property is destroyed by the armed forces of the host country and the demolition was not required by the necessity of the situation. In other situations, the host government's obligations are much less onerous.

First, many investment treaties include a provision requiring the host government to provide relevant investments with "full protection and security." This provision is generally understood to provide a general obligation for the host state to exercise due diligence in the protection of foreign investment, as opposed to creating "strict liability," which would render a host state liable for any destruction of the investment, even if it where caused by persons whose acts could not be attributed to the state. The provision does not extend to business losses flowing from civil strife that do not involve physical damage to the investment. Second, most treaties provide that if compensation is provided for losses occasioned by political violence, protected investors are to be treated no less favorably than

nationals of the host country or investors of a third country.

Regulatory risks. Risks associated with economy-wide laws and regulations are being addressed in part by efforts to harmonize international standards on environmental protection, competition law, and many other specific areas. Over time these efforts should lead to greater clarity and stability of such measures.

The risk of opportunistic government behavior under industry- or project-specific regulatory frameworks has so far been subject to less attention at the international level. If regulatory actions are severe enough to constitute expropriation, they may be covered by that provision. Otherwise, investment treaties will usually help only if the action in question is found to offend general provisions requiring "fair and equitable treatment" or "non-discrimination." The potential to expand the scope of international rules in this area is considered in box 3.13.

Quasi-commercial risks. Substantial defaults on supply or purchase obligations by government entities that are motivated by noncommercial reasons might in some circumstances constitute expropriation and thus fall within the relevant provisions of investment treaties discussed above. In some cases they might also violate more general obligations on nondiscriminatory treatment.[11]

Dispute Settlement

In the absence of binding international standards of conduct, investors and governments can determine standards on a case by case basis through contracts. To be effective contractual obligations need to be

BOX 3.13
International rules to reduce regulatory risk?

International rules could be developed to safeguard investments from unreasonable regulatory behavior, with the "takings" doctrine developed under the U.S. Constitution providing a possible analogy (see box 3.8). Such an initiative would need to address a number of challenges.

First, it is difficult to develop any objective standard of the "fairness" of a regulatory regime or regulatory outcomes.[1] A standard based on the rate of return received by the investor might encourage adoption of rate-of-return price-setting methodology, with its poor incentives for efficiency. Given the many factors that contribute to risk premia required by investors, it would also be difficult to assess the reasonableness of returns across different country environments in different periods. Another approach, used in utility licenses in the United Kingdom, would provide that regulated firms must be permitted to finance their investments, although this approach may not add much to the prohibition against expropriation already contained in investment treaties. Yet another approach would focus on the characteristics of the regulatory system itself, possibly by requiring that regulatory agencies enjoy certain safeguards of their independence and that procedures be transparent and include opportunities for investors to challenge a regulator's decision. This kind of approach is illustrated by the principles adopted as part of the recent World Trade Organization (WTO) Agreement on Basic Telecommunications.[2]

Second, there is the challenge of developing appropriate institutions to enforce the standards. The broader the discretionary authority involved, the greater the difficulty in identifying a mechanism that would enjoy the confidence of governments and investors. If standards were to evolve through case by case adjudications, decisions would need to be published, a feature absent from traditional arbitration commissions. The dispute settlement panels established under the WTO provide a possible model. There is also the broader question of whether any international body would be accepted as a legitimate arbiter on issues affecting, say, the level of residential water tariffs in a particular town.

Much work will be required before investors can look to international law to more effectively constrain the regulatory behavior of governments. An important first step would be to articulate general principles of "reasonable" regulatory behavior. If it were possible to define meaningful standards that enjoyed broad international acceptance, the next step might be to promote incorporation of those standards into contracts or national laws. Only then might it be feasible to consider elevating such standards to rules of international law.

1. For an interesting discussion of "fairness" notions in utility regulation, see Zajac (1995).
2. The WTO regulatory principles focus on fostering fair competition in international telecommunications, with norms dealing with matters including interconnection, transparency of regulation, and the regulator's independence from any operator. They do not address issues of unreasonable or unfair tariff regulation or the regulator's independence from political authorities.

enforceable. Many foreign investors are concerned that local courts may not be completely neutral arbiters of disputes involving the government. There may also be concerns over the capacity of even an impartial court to deal with the complex economic and technical issues often raised by infrastructure-related disputes. For these reasons it is common for foreign investors to seek arbitration of contractual disputes in a neutral country. International law plays an important part in supporting arbitration arrangements of this kind.

General Arbitration Regimes

Arbitration of international commercial disputes has a long history and is supported by a number of private initiatives, such as those of the International Chamber of Commerce and the London Court of International Arbitration. These institutions provide rules governing the conduct of arbitrations and facilitate the selection of arbitrators and the management of proceedings. In addition, the United Nations Commission on International Trade Law (UNCITRAL) has prepared rules on the conduct of proceedings. These rules and related arrangements are typically incorporated into contracts through dispute settlement clauses (see Paulsson 1995).

Arrangements of this kind can assist in obtaining arbitral awards. But awards are of little value if they cannot be enforced against the defaulting party. This concern is dealt with by multilateral treaties governing the recognition and enforcement of foreign arbitral awards. The principal convention is the 1958 New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards, which has more than 100 members. An arbitral award that meets the requirements of the Convention must be enforced as though it were a judgment of a superior court.[12]

Specialist Settlement of Investment Disputes

General arbitration regimes were established primarily to deal with commercial disputes between private firms. International investment disputes between governments and private foreign investors can raise more sensitive issues. In recognition of the special needs in this area, the International Center for the Settlement of Investment Disputes (ICSID) was established by convention in 1965 (see Shihata 1986 and Rowat 1992). More than 120 countries are now party to the Convention, which also has an "Additional Facility" for settling disputes involving states or nationals of states that are not party to the Convention.

The ICSID Convention establishes a specialist regime for dealing with any "legal dispute arising directly out of an investment" between states and nationals of other states. The cornerstone of ICSID jurisdiction is the consent of both parties, which may be expressed in commercial agreements, investment treaties, or any other written form. Once given, consent is irrevocable. Unless the parties agree otherwise ICSID arbitration is deemed to be the exclusive remedy.

To accommodate concerns reflected in the Calvo Doctrine, the Convention allows states to require, as a condition of their consent to ICSID arbitration, prior exhaustion of local remedies. This would place ICSID arbitration as the de facto court of appeal over national courts. In return for agreement to ICSID jurisdiction, the parties to the Convention also agree to waive diplomatic protection, or the bringing of international claims, in respect of the dispute in question. The Convention provides that awards are binding on the parties and has the same force as a final judgment of a court in the contracting state.

ICSID arbitration is well suited to disputes arising from private infrastructure arrangements. ICSID recently reported that it had received a request for arbitration for a dispute between a French company and the government of Argentina relating to a water and sewerage concession, which appears to be its first infrastructure-related dispute. Under the Convention details of the proceedings and any resulting award will remain confidential unless agreed otherwise by the parties.

POLITICAL RISK INSURANCE

Investors and lenders may seek to cover political and regulatory risks through insurance. The volume, tenor

and scope of insurance coverage have grown dramatically in recent years, with private infrastructure commanding a growing share. While traditional political risks are for the most part adequately covered, there are other important gaps in coverage as well as other limitations that mean insurance is far from a perfect salve for the risks associated with private infrastructure investments in developing countries.

Sources of Insurance

While the business of insurance dates back thousands of years, insurance to cover the political risks associated with offshore investment has been available only since 1948, when the U.S. Foreign Assistance Act (the Marshall Plan) provided coverage against inconvertibility to U.S. companies investing in war-torn Europe and Asia. Today insurance is available from national schemes, private insurers, and a few international entities, such as the Multilateral Investment Guarantee Agency.

National Schemes

The U.S. initiative was followed by similar programs in Japan and Germany in the 1950s; today most OECD and some non-OECD countries sponsor schemes that support the offshore ventures of their nationals. National schemes usually offer investment insurance and export credit insurance. In some countries, including the United States and Germany, the two products are offered by separate agencies, but in most countries a single national export credit agency offers both.

Investment insurance traces its origins to the Marshall Plan, and can cover equity as well as debt. Eligibility is typically tied to the nationality of the investor or lender, and coverage is usually limited to traditional political risks. The U.S. Overseas Project Insurance Corporation (OPIC) is one of the largest national insurers.

Export credit insurance has its origins in traditional export transactions. Most export credit agencies have recently created specialist project finance facilities to support the export of goods and services. Insurance coverage is limited to loans that finance the export of goods and services, but coverage extends to commercial as well as political risks (see Thompson 1996). This development is blurring the traditional distinction between investment insurance and export credit insurance.[13]

Private Schemes

Private insurers entered the political risk insurance market in 1972 to complement and compete with offerings by national schemes (Radcliffe 1986). The market is dominated by Lloyd's of London in the United Kingdom and American International Group (AIG) in the United States. In recent years the market has grown rapidly in terms of capacity available, periods of cover, and scope of risk coverage.[14] Unlike national schemes private insurers are not limited by the nationality of the investor or exporter or by considerations of national policy, and can be more flexible in crafting coverage to meet specific needs and situations. The lack of backing by a national government, however, can limit the capacity to offer longer terms and can involve higher prices.

Multilateral Investment Guarantee Agency

The Multilateral Investment Guarantee Agency (MIGA) was created in 1988 to help fill gaps in the coverage provided by national investment insurance schemes and private insurers. It began operations in 1990 and now has more than 140 member countries. In addition to traditional political risks, MIGA can provide coverage for breach of contract.

TABLE 3.1
New U.S. Overseas Project Insurance Corporation insurance in power and telecommunications, 1996
(millions of dollars)

Region	*Power*	*Telecom*	*Total*
Latin America and Caribbean	1,675	32	1,707
Asia	596	170	766
Africa/Middle East	200	11	211
Former Soviet Union and Central Europe	0	366	366
Total	2,471	579	3,050

Source: OPIC 1996.

Use of Insurance

The total volume of investment-related political risk insurance is difficult to gauge, as private insurers do not publish reports on their activities and export credit agencies do not always publish separate data for insurance relating to project financings and other export transactions. The volume of insurance appears to have grown rapidly in recent years, however, with OPIC alone providing $16.5 billion in political risk insurance in 1996, up from just $8.6 billion in 1995.

Infrastructure accounts for a growing share of this coverage. New insurance coverage by OPIC in power, telecommunications, and gas transmission alone grew from less than $100 million in 1990 to more than $3 billion in 1996, and power and telecommunications accounted for more than 18 percent of OPIC's new insurance business in 1996 (table 3.1).

Infrastructure is also the fastest-growing sector in MIGA's portfolio, growing from 1 percent in fiscal 1992 to 17 percent in fiscal 1997. Infrastructure-related investments account for more than 35 percent of the total active applications in MIGA's pipeline.

The decision on whether or not to buy insurance is made by the investor or lender and will depend on perceptions of the risks faced in particular countries and projects. A recent survey of infrastructure investors elicited the following responses in respect of selected Latin American countries (see table 3.2).

Perceptions also vary across particular kinds of risk. For example, the same survey found that infrastructure investors in Latin America were most concerned about convertibility and transferability (table 3.3).

TABLE 3.2
Countries in which investors require insurance
(percent of respondents)

Country	*Yes*	*No*	*Depends*
Argentina	89	6	6
Brazil	89	6	6
Peru	89	5	5
Venezuela	86	9	6
Mexico	84	11	5
Chile	71	23	6

Source: Institute of International Finance 1995.

Insurable Risks

For equity investors, insurance is paid against the occurrence of the specified event. For lenders, insurance is paid against a payment default that results from the occurrence of the specified event. National and multilateral schemes are more limited in their scope of coverage, particularly for investment insurance, while private insurers may be willing to cover a broader range of risks.

Traditional Political Risks

Expropriation. All insurance schemes cover expropriation, including "creeping" expropriation. The scope of coverage usually closely follows relevant standards of international law, which allows the insurer to pursue a subrogated claim against the host government. OPIC requires that the loss be total, which also facilitates its pursuit of subrogated claims.

When the expropriation involves a breach of contractual relationship with the host government, OPIC may structure its coverage to require that the investor pursue whatever contractual dispute resolution procedures it has in the underlying agreement before seeking recovery from OPIC. In these circumstances OPIC's coverage is limited to ensuring that the government abides by the agreed dispute resolution procedures and that, if the investor obtains an award using those procedures, the government pays it.

Convertibility and transferability. MIGA, OPIC, and other national schemes cover convertibility and transfer risk. OPIC and MIGA will cover changes in

TABLE 3.3
Investors' rankings of types of risk
(percent of respondents)

Risk	*Very important*	*Fairly important*	*Not important*
Inconvertibility, transferability	93	7	0
War	72	26	2
Expropriation	54	32	15

Source: Institute of International Finance 1995.

applicable regulations that impair the insured's ability to convert local currency as well as "passive" failures by exchange regulation authorities to act on applications for conversion within a set period of time. Private insurers also offer coverage in this area, but often have more limited capacity to absorb losses and reflect this in coverage and in their pricing strategies.

Political violence. MIGA, OPIC, and other national schemes cover losses due to declared or undeclared war, hostile actions by national or international forces, civil war, revolution, insurrection, and civil strife, including politically motivated terrorism and sabotage. OPIC and MIGA specifically exclude actions undertaken primarily to achieve student or labor objectives. Private insurers can tailor coverage to particular needs, but coverage is often severely limited.[15]

Regulatory Risks

National and multilateral schemes do not provide specific coverage for regulatory risks. Treatment of these risks depends in large part on whether the government action constitutes a breach of a specific contractual undertaking with the investor or is tantamount to expropriation.

Actions that constitute a breach of contract. OPIC does not provide specific coverage for breach of contract. In some circumstances, however, a breach of contract dealing with regulatory matters may be so fundamental to the operation of the project that it constitutes expropriation. In those circumstances the insurance may be structured to require that the investor pursue whatever contractual dispute resolution procedures are specified in the underlying agreement before seeking recovery from OPIC.

MIGA may also treat breach of contract by the government as expropriation in certain circumstances. In addition, it can issue separate coverage for breach of contract if the insured does not have recourse to a judicial or arbitral forum in which to determine the claim of repudiation or breach, a decision by such a forum is not rendered within a reasonable period of time specified in the insurance contract, or such a decision cannot be enforced. In essence, it is the subsequent "denial of justice," rather than the breach of contract, that provides the basis for coverage. To date MIGA has issued only one policy for breach of contract. Export credit insurers and private insurers can provide cover for breach of contract.

Actions that do not constitute a breach of contract. OPIC will cover regulatory actions only if they amount to expropriation, that is, they constitute a breach of international law or material breach of local law and result in total loss. Few regulatory actions would appear to meet this standard. MIGA's definition of expropriation requires evidence of confiscatory intent or effect.

Private insurers can tailor coverage to particular needs, including changes in government policy that do not involve a breach of contract or amount to expropriation, but coverage is often severely limited.

Quasi-Commercial Risk

Quasi-commercial risks involve a breach of contract. In some circumstances they may fall within MIGA's separate coverage for breach of contract. Export credit insurers and private insurers provide coverage for breach of contract, including breaches by government-owned enterprises.

In principle, breach of purchase or supply contracts by the government or government entities might be sufficient to constitute expropriation. OPIC usually excludes from its expropriation coverage actions by government in its capacity as supplier or purchaser. However, it is prepared to cover cases for which the investor can establish a political rather than a commercial motivation. MIGA and private insurers do not have this exclusion.

Other Limits on Insurance Coverage

Each insurance scheme has its own coverage restrictions, in relating, for example, to countries, forms and types of investment, and exposure limits. The key

restrictions for a selection of schemes are outlined in annex table A3.2 and summarized below.

Country Coverage

National investment insurance schemes impose eligibility criteria to determine coverage of particular investors. National export credit insurance schemes usually focus on the country of origin of the exported goods and services. MIGA requires that the investor be a national of a member country. Private insurers have no restrictions of this kind.

Most insurers manage their exposure to particular countries as part of a risk diversification strategy. National schemes may also limit coverage to countries in which there is a bilateral investment treaty or similar mechanism for facilitating the enforcement of subrogated claims, and MIGA requires that the host country be a member government. National schemes sometimes impose restrictions to reflect their national policies; for example, OPIC, under guidance of the U.S. State Department, does not currently operate in Cuba, North Korea, and certain other countries. Private insurers face fewer formal restrictions of these kinds, and generally ration country coverage through their pricing strategies.

Forms and Types of Investment

Most investment insurance schemes adopt a broad definition that includes new investments as well as privatizations. OPIC and other national schemes typically insure equity, parent company debt, and bank loans to projects. MIGA focuses on insuring equity holders (including shareholder loans and loan guarantees issued by equity holders), but it can also cover loans by unrelated institutions provided that a shareholder's investment is also insured by MIGA. Private insurers are more flexible. Export credit insurance focuses on commercial bank loans used to finance the export of relevant goods and services.

MIGA, OPIC, and some other national insurers must also be satisfied that the proposed investment will contribute to the development of the host country and be environmentally sound. Private insurers impose no restrictions of this kind.

Exposure Limits

OPIC has a limit of $200 million per project and a country limit of 15 percent of its total portfolio. MIGA recently increased its limits to $75 million per project and $325 million per country. Private insurers can be more flexible, depending on their appraisal of the risks in particular operations and their capacity to diversify and provision for those risks. AIG has limits of $120 million per project and $500 million per country. Export credit insurers often have no pre-defined project or country limits.

Increasingly, insurers are collaborating to expand the volumes of insurance available. In addition to collaborations between private insurers and reinsurers, there has been a recent trend toward collaboration between private and public insurers. For example, MIGA has established a Cooperative Underwriting Program under which it is the insurer-on-record, but a portion of the risk is underwritten by a private insurer. In 1997 MIGA also entered into a reinsurance agreement with a private insurer. Collaborative arrangements of this kind mean that the industry is now able to provide more than $1.2 billion of coverage per project.

OPIC will cover up to 100 percent of losses for lenders and 90 percent of losses by equity investors. MIGA will cover up to 90 percent of losses for both equity investors and lenders. Some export credit insurers will provide coverage for 100 percent of political risks, while others have limits of 90 or 95 percent. Private insurers can provide coverage for 100 percent of losses for equity investors and lenders.

MIGA, OPIC, and other national investment insurers generally limit coverage to 15–20 years. Until recently private insurers offered only much shorter terms, often limited to three years. Some private insurers now offer up to ten years of coverage for certain risks. Export credit insurers are bound by an OECD "consensus" that limits terms according to category of country, with less developed countries eligible for the longest terms of up to ten years. The power

sector is an exception, where coverage for up to twelve years is possible in any country.

Policy Considerations

Insurance raises several policy issues, including considerations of adverse selection and moral hazard, impact on host government commitment, and risk spreading and loss absorption.

Adverse Selection and Pricing Insurance

All insurance schemes must deal with the problem of adverse selection, that is, the process by which individuals with a high expectation of loss will seek out insurance and those with a low expectation of loss will not. In a traditional insurance market insurers usually try to deal with adverse selection by separating groups according to the risks they face and charging premiums based on riskiness.

Pricing insurance against political and regulatory risks poses several difficulties. An efficient pricing system would cover all costs, including full provisioning against future claims. To send proper signals to investors and governments, prices should also discriminate according to the level of risk in each project and country. Pricing can also be used as a tool in portfolio management, by charging higher prices for cover in countries in which insurers are already heavily exposed.

These principles are adopted by private insurers, but to a more limited extent by many national and multilateral schemes, whose pricing strategies can be distorted by two factors. First, they can rely on the backing of their sponsoring governments (and their taxpayers), which reduces the need to make full provision for catastrophic losses. While some schemes are required by their enabling legislation to be self-sustaining, others appear to involve an implicit subsidy.[16] Second, some schemes have more limited freedom to discriminate in their pricing between host governments and rely on less efficient measures to ration their exposure to particular markets.

Comparisons between insurers are difficult because of differences in coverage, pricing structures, and, especially in the case of private insurers, differences across countries and in availability of coverage. Some indicative premia provide a general sense of rates charged, however (table 3.4).

Incentives Facing the Insured: Moral Hazard

Insurance schemes must also deal with the problem of moral hazard, that is, the fact that insuring individuals against loss gives them weaker incentives to protect their own interests. In the case of political risk insurance, the concern is that insured investors might have less incentive to protect their own interests by selecting projects wisely and managing their relationships with host governments with appropriate care. Indeed, if the insured's business is operating less profitably than was anticipated, there may even be incentives to instigate actions that lead to expropriation in the hope of collecting on the insurance.

Political risk insurance deals with these concerns in several ways. Schemes usually specifically exclude coverage for acts instigated or provoked by the insured. In addition, insurers attempt to leave the insured partly exposed to loss. Many insurers limit compensation to the net book value of the investment rather than fair market value. Moreover, insurers such as OPIC require equity investors (but not unrelated lenders) to maintain the risk of loss for at least 10 percent of the book value of its interests; for this 10 percent the investor is prohibited from obtaining insurance from any source. Waiting periods can also play a similar role, while also presenting

TABLE 3.4
Indicative insurance premia
(basis points per year)

Risk	*OPIC*	*MIGA*	*Private insurers*
Expropriation	60	90	25–200
Political violence	60	85	15–100
Convertibility/ transferability	30	50	100–200
Breach of contract	n.a.	100	125–250

n.a. Not available.
Note: OPIC premia based on equity; debt is priced differently. MIGA also charges a standby fee of 25–50 bps per year. Actual pricing will depend on the nature of project and, in the case of private insurers, the country in question.

opportunities to settle the underlying problem amicably.

Incentives Facing the Host Government: Impact on Commitment

It has been suggested that because political risk insurance shifts the costs of opportunistic behavior to the insurer it does little to strengthen the resolve of the host country to abide by its commitments (Levy and Spiller 1996). This is an important issue, which warrants closer scrutiny.

Certainly, private insurers appear to be concerned that a government's knowledge of the existence of insurance might actually encourage opportunistic behavior, as the government will know that the investor will be indemnified for any resulting losses (see Kessler 1992). For this reason private insurers usually require that the existence of insurance be kept confidential.

But insurers are also in a position to exercise an important restraining influence over host governments. First, national and multilateral insurers can use their leverage to intervene with host governments to prevent or reverse an action that would result in loss. In the case of one national insurer, for example, three out of four notifications of potential claims are settled without a claim payment (West 1996) and MIGA has yet to pay out a claim. Second, if insurers cannot prevent or reverse the action, they can stand in the shoes of the investor through subrogation clauses to recover compensation from the host government. OPIC, for example, has established a recovery rate of 98 percent over its twenty-five-year history. Taken together these measures can deter inappropriate conduct by the host government and thus reinforce the government's resolve to abide by its commitments. Presumably reflecting at least in part their stronger leverage over host governments, national and multilateral insurers do not mandate confidentiality for their insurance, and some even require the host government to approve of the issuing of insurance.[17]

The enforcement dimension of political risk insurance also highlights the important link between insurance coverage and international legal standards discussed in the previous section. Insurers can rely on investment treaties to pursue subrogated claims against the host government, some national insurers require that a treaty be in place before insurance is issued.[18] Most insurers also limit coverage in part by reference to standards of conduct that can be enforced through international arbitration.

Finally, although the immediate financial burden of insurance falls on the insured, the resulting increase in development and financing costs will ultimately be reflected in higher infrastructure tariffs. Host governments thus retain a strong incentive to reduce the perceived need for insurance.

Risk Spreading and Loss Absorption

Insurers have two additional mechanisms for managing risks: risk spreading and loss absorption. Risk spreading is particularly important with respect to claims that might not be fully recoverable from host governments, such as losses resulting from political violence that was not the direct responsibility of the government or its agents. To be effective risk spreading requires a relatively large pool of insured parties operating in different markets with exposure to different risks. Particularly given the difficulties of forecasting political risks, insurers must actively manage their exposure to particular countries and risks.

National insurers may also be in a better position to absorb losses than insured companies or private insurers. Losses that have not been adequately provisioned can ultimately be passed on to their own taxpayers, a luxury not available to private insurers. In addition, national insurers are also often in a position to "recycle" blocked currency to meet local expenditures of their embassies, which can give them an advantage in extending coverage for currency convertibility and transferability.

THIRD-PARTY GUARANTEES

Guarantees issued by sovereign governments or multilateral development banks are flexible instruments that can do much to reinforce the commitments of governments and government entities. Their main advantages over insurance are that they can be crafted to meet a broader range of risks—including regulatory

and quasi-commercial risks—and are not subject to project and country limits. If appropriately managed they can also strengthen a government's resolve to abide by its commitments. But they also have their share of weaknesses and even dangers.

The term "guarantee" is often used loosely and inconsistently.[19] Strictly speaking, a guarantee is a contractual arrangement under which a third party (the guarantor) agrees to fulfill the financial or other obligations of the guaranteed party (the principal obligor) to another party (the beneficiary) in the case of default by the principal obligor. In private infrastructure arrangements, the principal obligor will typically be a government entity that has given undertakings to the private investor.

Sources of Guarantees

In principle, any entity—public or private, local or foreign, solvent or insolvent—can act as a guarantor for obligations of a government entity. In practice, however, a guarantee will be of limited value to the beneficiary unless it is provided by an entity that is in a position to honor the principal obligor's financial or other commitments. This discussion focuses on two sources of guarantees: sovereign governments and multilateral development banks.

Sovereign Guarantees

Subject to constitutional and other legal requirements in each country, sovereign governments are able to pledge their "full faith and credit" to support the obligations of government-owned enterprises and subsovereign entities. Such guarantees are enforceable as contracts and represent contingent liabilities of the government until they are called or expire. In some cases, the nature and extent of the government's obligations is ambiguous (box 3.14).

Multilateral Development Bank Guarantees

In recent years the World Bank and other multilateral development banks have launched or reinvigorated loan guarantee programs.

The World Bank's partial risk guarantee is intended to cover debt, rather than equity, and can cover up to 100 percent of principal and interest. There are no a priori limits to the risks that can be covered, although in practice they are limited to specific contractual undertakings offered to the project company by the government and government entities. Although the guarantee is generally payable on demand, the Bank usually requires a grace period to provide an opportunity to workout defaults. It also requires that the relevant dispute settlement provisions contained in the underlying contract be followed before demands are made on the guarantee. The Bank's charter requires the sovereign to issue a counter-guarantee, which usually takes the form of an indemnification agreement (World Bank 1996).

Other multilateral development banks' can also issue partial risk guarantees, some without the need for a sovereign counterguarantee. The Inter-American Development Bank, for example, recently approved its first private sector partial risk guarantee, for a wastewater treatment plant in Colombia.

Use of Guarantees

Guarantees are usually requested by an investor or lender when they have concerns about the creditwor-

BOX 3.14
Guarantee or mere comfort letter?

To be enforceable as a guarantee, the government's undertaking must evince an unambiguous commitment to meet the obligations of the principal obligor in the case of default. The formal requirements for a binding legal commitment vary from country to country.

In negotiations for guarantees investors and governments often haggle over the wording used in the sovereign's undertaking, with investors generally seeking clear and legally binding commitments and the government often attempting to limit its exposure. In some cases the compromise is a comfort letter, which expresses the government's support for the venture, entity, and perhaps contract in question, but falls short of an unequivocal guarantee. The legal status and effect of such letters can be ambiguous. This can exacerbate differences between the parties should it ever be necessary for the investor to rely on the arrangement and can also complicate the government's accounting for contingent liabilities.

thiness of a government entity as a contractual partner. Guarantees may be seen as a complement to or substitute for political risk insurance.

Few governments maintain proper financial accounting for guarantees, which makes it difficult to track the extent of such guarantees within countries, let alone worldwide. In recent years, however, governments have become much more cautious in extending guarantees, reflecting a greater appreciation of the potential impact of contingent liabilities.

The World Bank has issued two partial risk guarantees to date, with the Uch Power Project in Pakistan illustrating the approach (box 3.15).

Risks Covered by Guarantees

Guarantees can be crafted to cover any kind of risk. This flexibility can make them particularly useful in addressing matters not adequately covered by political risk insurance, such as regulatory risk and quasi-commercial risk. In each case, the obligation would need to be clearly specified in contractual form.

BOX 3.15

Using a World Bank partial risk guarantee in Pakistan

In 1996 the World Bank issued a partial risk guarantee to help catalyze private financing for Pakistan's Uch Power Project, a 586 megawatt gas-fired combined cycle plant. The project will receive its fuel supply from the government-owned Oil and Gas Development Authority and will sell the power produced to the government-owned Water and Power Development Authority.

The Bank's guarantee supported a $75 million syndicated commercial bank loan for a term of fifteen years. The guarantee would be triggered in the event of a debt service default resulting from noncompliance by the government of Pakistan with its contractual payment obligations under the implementation agreement or the government guarantee of the power purchase agreement or gas supply agreement. Specific risks covered included payment obligations of the utility (revenue and penalties), obligations to supply fuel (nonperformance), central bank obligations to provide foreign exchange, changes in law, political events in Pakistan, and certain natural events relating to the governmental entities.

Policy Considerations

Guarantees raise many of the same policy issues raised by insurance, with some important differences.

Adverse Selection and Pricing of Guarantees

Adverse selection is a problem in guarantees, because those with a high expectation of loss have the strongest incentive to seek a guarantee. The problem can be dealt with only partially through pricing strategies that reflect the riskiness of particular countries and activities.

Pricing guarantees raises many of the same difficulties as pricing insurance. An efficient pricing system would cover all costs, including provisioning against future claims. To send proper signals to investors and the principal obligor, prices should also discriminate according to the level of risk in each project and country.

Sovereign governments typically do not levy fees for their guarantees for political and regulatory risks; charging a fee for covering risks that were under its control would be tantamount to demanding protection money from investors—"pay up, or suffer the consequences."

The World Bank does levy fees for its guarantee, which are charged to either the borrower or the lender based on the amount covered under the guarantee. Two types of fees are charged, a standby fee and a guarantee fee. The standby fee, applied during the period when the guarantee is in force but not callable, is currently 25 basis points a year on the Bank's guarantee exposure. The guarantee fee, applied during the period when the guarantee is callable, ranges from 40 to 100 basis points a year on outstanding debt covered by the guarantee. The guarantee fee consists of a base fee of 25 basis points plus a premium of 15–75 basis points determined case by case to reflect the level of coverage and value to the beneficiary (World Bank 1996). To reconcile this pricing strategy with the Bank's nondiscriminatory pricing policy among member countries, the Bank refunds to the government any fee above the base fee. However, this approach can create perverse incentives for governments: since the higher the per-

ceived risks, the greater the potential income from Bank guarantees.

Incentives Facing the Beneficiary: Moral Hazard

Guarantees can create potential moral hazard problems, as protecting beneficiaries from loss weakens their incentives to take steps to reduce the risk of loss. Equity investors will usually be more susceptible to incentive problems of this kind than lenders. Insurance schemes deal with this concern in part by leaving investors partially exposed to loss through measures such as deductibles and waiting periods. Unlike insurance, guarantees typically cover the full extent of the principal obligation, without any deductible. When guarantees are provided to equity investors, care needs to be taken to ensure that the beneficiary continues to have incentives to protect their own interests.

Incentives Facing the Principal Obligor: Impact on Commitment

Under insurance schemes, the burden of paying claims falls in the first instance on the insurer. Insurers are often in a good position to intervene with governments to avoid loss, however, and can also rely subrogation clauses to recover compensation from the host government, with the combined effect being to strengthen a government's resolve to abide by its commitments to the investor. The position with guarantees varies between sovereign and multilateral development guarantees.

In the case of sovereign guarantees, the sovereign's enforcement capacity will depend on how much control it has over the principal obligor, which can vary between guaranteed entities. While the sovereign will usually be in a strong position to control the behavior of enterprises it owns, it often has less influence over subnational governments and their enterprises. If the national government lacks effective control over a principal obligor, the principal obligor will face less discipline in abiding by its commitments; in extreme cases it may even be encouraged to neglect those commitments in the knowledge that the investor will be protected by the guarantee and it will be left harmless. Sovereign governments would thus be ill-advised to issue guarantees covering entities over which they lack effective control or with which they have not reached effective indemnification agreements.

Assuming a sovereign government has the necessary enforcement capacity, its incentives to exercise that control can be affected by the manner in which it manages its contingent liabilities. As discussed below, inadequate accounting for the contingent liabilities involved may reduce a government's vigilance in ensuring compliance with the primary obligation.

Guarantees issued by multilateral development banks more closely resemble insurance. Like multilateral and national insurers, multilateral development banks can rely on their leverage over host governments to intervene to avoid loss. If losses nevertheless occur, the mechanism for recovering compensation from the defaulting government varies. When the sovereign government has issued a counter guarantee—which will always be the case with the World Bank—the burden of noncompliance falls back onto the national government and its taxpayers. If the host government adequately accounts for its contingent liabilities, the counter guarantee can provide strong incentives to abide by its commitments. In the absence of a counter guarantee, a multilateral development bank must pursue subrogated claims against the host government.

Risk Spreading and Loss Absorption

Insurers can complement their enforcement ability with respect to host governments with two additional risk management mechanisms: risk spreading and loss absorption. Similar strategies are open to guarantors, although there are differences between sovereign and multilateral development bank guarantees.

Risk spreading is particularly important with respect to claims that might not be fully recoverable from the principal obligor. Insurers deal with this risk by managing their exposure across a relatively large pool of insureds operating in different markets. Sovereign governments generally confine the use of their guarantees to local projects, which limits the ability to manage risks in this way; managing risk thus depends on enforcement or loss absorption.

Multilateral development banks are in a position to diversify their exposure across countries and a potentially larger pool of operations.

Loss absorption is an option for some insurers, particularly for national insurers that can, if necessary, transfer losses back to their own taxpayers. In the case of sovereign guarantees, unrecovered losses are absorbed by taxpayers of the host government. In the case of multilateral development bank guarantees any unrecovered losses can be absorbed through margins on international lending operations.

Management of Risks and Contingent Liabilities

Insurance is provided by enterprises staffed by professional analysts and managers of risks and contingent liabilities. Because insurance is typically offered by corporations, contingent liabilities tend to be transparent and subject to well-defined accounting rules. In contrast, sovereign guarantees are usually managed by ministries with less experience in risk analysis and management, and full accounting for contingent liabilities remains the exception rather than the rule. This creates the potential for governments to mismanage their exposure.

In some cases poor accounting for contingent liabilities may create incentives to issue guarantees for entities over which the government lacks effective control or dull the government's incentives to ensure compliance with the primary obligation. Inadequate appreciation of the costs of guarantees may lead governments to issue guarantees to delay attention to more fundamental reforms that would make such guarantees unnecessary. This may be a particular problem in the case of quasi-commercial risks, where granting guarantees on behalf of uncreditworthy government-owned enterprises may be more expedient than undertaking the necessary ownership or regulatory reforms. In many cases such shortsighted "Band-Aid" approaches just exacerbate the underlying problem (Sack 1997).

Although multilateral development banks are relatively new to this line of business, they can usually draw on broader experience in managing exposure in international financial transactions. They also have the ability to diversify their exposure across countries.

STRATEGIES FOR COVERING PARTICULAR POLITICAL AND REGULATORY RISKS

Political and regulatory risks can never be fully eradicated. The goal should be to establish a stable and predictable environment in which investors feel comfortable accepting the risk of inevitable policy adjustments without demanding significant risk premia or requiring costly and cumbersome risk mitigation instruments. The policy reforms needed to meet this goal are well understood. Government's must enhance their commitment capacity by establishing effective and durable institutional safeguards for private property rights. Experience in successful reforming countries shows that, with sufficient political resolve, the benefits of reforms can start being realized within a relatively short period.

Retreating from traditional government-owned monopolies in infrastructure industries can, if managed properly, send an important signal to investors and citizens alike, and thus contribute to the broader reform process. In many cases these efforts will come before broader legal and institutional reforms have been fully established or demonstrated to be durable. Governments and investors thus need to evaluate alternative risk reduction and management strategies, the strengths and weaknesses of which will depend on the particular risks involved.

Traditional Political Risks

Strategies for covering traditional political risks cover a range of options for investors and governments, some very specific and some of a broader policy nature.

Expropriation

There is now almost universal acceptance of the principle that governments should not expropriate property without providing just compensation. Governments and investors have a range of strategies for ensuring that this principle is respected, many of which are common across all sectors of the economy. A number of specific measures can also be taken to address some

of the particular risk factors associated with infrastructure investments. These include expanding the role of competition, involving local participation in enterprise ownership, educating the public on the role of costs in infrastructure tariffs, and establishing regulatory mechanisms that guard against the potential misuse of market power. Transparent arrangements for enlisting private sector involvement can also reduce the risk of policy reversal. These measures can be complemented by reforms to national constitutions, judicial systems, and regulatory institutions that constrain opportunistic government behavior.

Commitment to this principle can also be reinforced by adherence to a growing number of bilateral and regional investment treaties and by participating in the development of the new multilateral treaty. Where necessary, these measures can be complemented by specific contractual undertakings and by political risk insurance from diverse sources. Sovereign or multilateral development bank guarantees can also be used to enhance the credibility of specific contractual undertakings, although care needs to be taken to ensure that these instruments are carefully managed to avoid excessive or inappropriate use.

Currency Convertibility and Transferability

Building investor confidence that local revenues will be convertible and transferable requires effective macroeconomic policy, including measures to insulate central banks and other responsible authorities from political interference. Investors can also reduce their exposure to this risk by seeking greater domestic financing. Government commitment to unrestricted transfers can be reinforced by adherence to relevant international treaties. Where required, these measures can be complemented by political risk insurance. In some cases sovereign or multilateral development bank guarantees might be considered as an alternative or complementary tool, subject to the caveats noted above.

Political Violence

Political reforms that contribute to more peaceful regime changes and enable greater accommodation of minority viewpoints are perhaps the key to reducing the risk of political violence. Also important are ongoing regional and global integration that can reduce some of the tensions that led to past conflicts. Terrorism and sabotage are more challenging but can be addressed at least in part by ongoing enhancement of law enforcement capabilities. Where specific concerns exist, governments can provide more detailed commitments as part of the contractual or regulatory framework.[20]

International investment treaties offer only limited help in this area. However, insurance is available from various sources, and sovereign and multilateral development bank guarantees can be used to enhance the credibility of any specific contractual commitments.

Regulatory Risks

Economywide laws and regulations and industry-specific regulatory frameworks each present different challenges.

Economywide Laws and Regulations

Economywide laws and regulations are likely to be in a perpetual state of evolution. At the same time international efforts are ongoing to harmonize or unify regulatory standards on a growing number of issues, and intensifying competition for global capital is also having an important restraining influence on governments. Issues of particular concern to infrastructure investors can be dealt with as part of the industry- or project-specific contractual or regulatory framework. Cover is also available from some insurers and any specific contractual commitments can be enhanced through sovereign and multilateral development bank guarantees.

Industry- or Project-specific Regulatory Frameworks

Industry- or project-specific regulatory frameworks pose difficult challenges because of the policy tradeoffs involved. Increased reliance on competitive markets can reduce the scope and burden of economic regulation. Where economic regulation continues to be

required, several promising strategies exist for reducing risks. Populist pressures on governments to intervene in pricing and other issues can be diminished through many of the strategies relevant to expropriation, including moves toward more competitive markets, increased local participation in the ownership of infrastructure enterprises, and the realignment of consumer expectations about the role of costs in infrastructure prices. Governments can also tie their hands against improper interference by establishing well-defined regulatory frameworks and more independent regulatory entities.

Mechanisms exist for anchoring specific regulatory commitments in laws and contracts and for enforcing contractual commitments through arbitration. While the resulting rigidities reduce the flexibility to adapt to changing circumstances and provide incentives for efficiency, some governments may be prepared to pay this price to induce investment at lower financing costs. Where the balance should be drawn will depend on the country risk environment, the nature of the investment, and the government's policy priorities.

In the future these measures could be augmented by new international rules governing acceptable regulatory conduct. The recent WTO rules on telecommunications illustrate one possible approach. Until then investors who require greater comfort can find some, albeit limited, coverage from insurance schemes. Sovereign and multilateral development bank guarantees can also be used to support specific contractual commitments on regulatory matters.

Quasi-Commercial Risks

Quasi-commercial risks are largely a relic of the old paradigm of infrastructure management. The increasingly common solution is to privatize agents performing commercial activities to ensure an effective separation from government. Appropriate sequencing of private involvement can do much to reduce the need for sovereign or multilateral development bank guarantees or other supporting instruments.

If privatization is not feasible in the near term, risks can be reduced through policy reforms that help insulate government-owned enterprises from political interference. Specific supply and purchase commitments can be anchored in contracts that are subject to international arbitration. Investors also have access to insurance. Sovereign and multilateral development bank guarantees can play a role in transitional settings, but care needs to be taken to ensure that they are not used to as an expedient to postpone rather than to facilitate appropriate sector reforms.

Future Directions

The rapid increase in private involvement in infrastructure over the last decade has been accompanied by often dramatic developments in each of the instruments and strategies reviewed in this chapter. These include new insights into the nature of political and regulatory risk and into the design of policy reforms and the structuring of transactions to reduce those risks; the expanded role of international law in dealing with investment protection, dispute settlement, and even aspects of infrastructure regulation; bold developments in the political risk insurance industry, including the blurring of traditional distinctions between investment insurance and export credit insurance and the coming to age of the private insurance market; and a reconsideration of the role of sovereign guarantees and the establishment or reinvigoration of guarantee programs by multilateral development banks.

Each of these instruments and strategies has a common objective: to facilitate the flow of private capital into developing countries. Yet developments in each area appear to be proceeding largely in isolation, with only limited consideration of the relationship between particular initiatives or of the opportunities for leveraging results through enhanced collaboration. There is not even a commonly accepted terminology for discussing identical concepts and issues between the fields of activity. As a result national governments, private investors, and their advisors face a bewildering range of options, without the benefit of a more coherent framework for evaluating the pros and cons of alternatives or the optimal packaging or sequencing of different reform elements or instruments.

The time is ripe to stand back and take a broader view; to assess more fully the state of play in each field; to review more rigorously the remaining gaps and weaknesses in coverage, as well as in understanding; and to explore the potential for elaborating a more coherent framework that could provide guidance to policymakers, practitioners, and investors.

Notes

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1. For a discussion of political risk see Chermak (1992); Sethi and Luther (1993); and West (1996). For a discussion of regulatory risk see Ahn and Thompson (1989); Kolbe, Tye, and Myers (1993); Llewellen and Mauer (1993); and Appleyard and McLaren (1997). In negotiations with governments investors often use the term "political" or "noncommercial" risk to encompass any risk they believe should be borne by the government.

2. For analyses of regulatory risk facing utilities in the United States see Woroch (1988); Ahn and Thompson (1989), Kolbe, Tye, and Myers (1993); and Llewellen and Mauer (1993). For a discussion of regulatory risk facing utilities in the United Kingdom see Appleyard and McLaren (1997). For an interesting attempt to compare regulatory risks in different countries see Alexander, Mayer, and Weeds (1996).

3. For example, studies of the United States show that elected regulators are perceived as more likely to respond to populist pressures than appointed regulators, with measurable differences in the cost of capital. See Costello (1984) and Formby, Mishra, and Thistle (1995).

4. This is the so-called Averch-Johnson effect, in which investors face incentives to overinvest in capital when it is used as the basis for determining regulated returns. Of course, incentive regimes that require more discretion have shortcomings of their own, including increasing the cost of capital. See Llewellen and Mauer (1993) and the inferences drawn from international comparisons in Alexander, Mayer, and Weeds (1996).

5. While all contracts can be renegotiated, in the private infrastructure area this is often complicated by conditions of bilateral monopoly, which make it difficult to achieve cooperative solutions. The outcome of such negotiations will depend on the relative bargaining power and skill of the parties. The brinkmanship of take-it-or-leave-it threats often leads to bargaining stalemates that are injurious to both parties (and to consumers). For an analysis of this problem see Scherer and Ross (1990; 519–22).

6. It has been suggested that especially valuable partners are local investors who are "above the political fray, honest, and not too closely identified with one political party or faction" (West 1996, 7). Certainly, involvement by politically connected partners increases the risk that a regime change may turn an asset into a liability.

7. Of course, the home government can also be a source of political risk for its investors, with the risk of imposition of export controls or economic sanctions harming rather than helping its investors.

8. On bilateral investment treaties generally, see Dolzer and Stephens (1995). For a review of recent bilateral investment treaty practice in Latin America, see Escobar (1996). For a list of bilateral investment treaties to which Latin American and Caribbean states have entered, see annex table A3.1.

9. The most recent major effort was the Draft Convention on Protection of Foreign Property, prepared by the OECD in 1967, which failed to gain sufficient support to be opened for signature. The Articles of Agreement of the International Monetary Fund include provisions governing international capital flows.

10. The Germany–Swaziland treaty contains such a provision, but it is limited to transfers of the proceeds of liquidation in the event of sale of the investment, and it still provides a guarantee in respect of an annual minimum transfer of 20 percent of the proceeds. The Articles of Agreement of the International Monetary Fund distinguish between current transactions, in which restrictions are prohibited, and capital transactions, in which restrictions normally are allowed.

11. In the current Multilateral Agreement on Investment negotiations, there is debate over whether new multilateral rules should contain a specific prohibition on

state-owned monopolies or monopsonists acting in a discriminatory manner with respect to goods or services in which they enjoy a monopoly or monopsony (see OECD 1997).

12. In considering the scope of application of the Convention, it is important to note whether the implementing country has adopted one or both of two possible reservations. The first limits enforcement to awards made in another contracting state; the second confines application of the Convention to differences arising out of legal relationships that are considered commercial under the national law of the implementing state (see Redfern and Hunter 1991).

13. The difficulty of maintaining distinctions in this area is creating tensions among OECD countries, as export credit insurance is regulated by a "consensus" between OECD members, while investment insurance is not (see "Moving the Goalposts," *Project and Trade Finance,* August 1996).

14. See Brownlees (1997), who speculates that in a few years the private market might supplant the national schemes completely.

15. Traditionally, Lloyd's of London has faced restrictions on its ability to cover war risks on land for property, although those restrictions have recently been relaxed (see Brownlees 1997).

16. There has been a long debate over whether national investment insurers are subsidizing investors, foreign governments, or both rather than operating on a fully commercial basis (see Kessler 1992). National export credit insurers are also often seen as subsidizing national exports, to the extent that OECD countries have found it necessary to regulate the terms of such insurance through a "consensus."

17. This is not to suggest that private insurers are without their own leverage. They, too, can rely on subrogation clauses to pursue claims against host governments, and they are often in a position to wield influence in their own right. For example, one major U.S. insurer includes on its board of directors a former president of the World Bank, a former U.S. Secretary of the Treasury, and a former U.S. trade representative, and its International Advisory Board includes a former U.S. Secretary of State and a former prime minister.

18. This is the case in Germany, for example. In the United States, OPIC may offer insurance to countries with which there is no bilateral investment treaty if it has concluded a separate agreement with the host government recognizing OPIC's right to subrogation and agreed to an effective dispute settlement mechanism.

19. Some use the expression "guarantee" to include any contractual undertaking by a government, even if it does not involve support to a third-party. However, such a usage obscures important differences between cases in which the government is expressing a primary obligation (as discussed in section one of this chapter) and when it is doing so in support of the primary obligations of another.

20. When investments are perceived as being particularly vulnerable to sabotage or other action, governments can provide specific commitments on state-provided security measures and compensation in the event that those measures prove inadequate. For example, in the case of Colombia's TransGas de Occidente gas pipeline project, special provision was made for guerrilla or terrorist acts perpetrated with the intent to produce damage to the pipeline.

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Annex

TABLE A3.1
Bilateral investment treaties concluded by selected Latin American and Caribbean countries, October 1996

Country	*Number of treaties*	*Treaty partners*
Argentina	37	Armenia, Australia, Austria, Belgium–Luxembourg, Bolivia, Bulgaria, Canada, Chile, China, Croatia, Denmark, Ecuador, Egypt, Finland, France, Germany, Hungary, Israel, Italy, Jamaica, Malaysia, Netherlands, Peru, Poland, Portugal, Republic of Korea, Romania, Senegal, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, United Kingdom, United States, Venezuela
Barbados	5	Germany, Italy, Switzerland, United Kingdom, Venezuela
Bolivia	18	Argentina, Belgium-Luxembourg, Chile, China, Cuba, Denmark, Ecuador, France, Germany, Italy, Netherlands, Peru, Republic of Korea, Romania, Spain, Sweden, Switzerland, United Kingdom
Brazil	10	Chile, Denmark, Finland, France, Germany, Italy, Portugal, Republic of Korea, Switzerland, United Kingdom
Chile	28	Argentina, Belgium-Luxembourg, Bolivia, Brazil, China, Croatia, Cuba, Czech Republic, Denmark, Ecuador, Finland, France, Germany, Italy, Malaysia, Norway, Paraguay, Philippines, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Ukraine, United Kingdom, Uruguay, Venezuela
Colombia	3	Germany, Peru, United Kingdom
Costa Rica	4	France, Germany, Switzerland, United Kingdom
Cuba	8	Bolivia, Chile, China, Italy, Russian Federation, South Africa, Spain, United Kingdom
Ecuador	12	Argentina, Bolivia, Chile, China, El Salvador, France, Germany, Paraguay, Switzerland, United Kingdom, United States, Venezuela
El Salvador	4	Ecuador, France, Spain, Switzerland
Haiti	4	France, Germany, United Kingdom, United States
Honduras	5	Germany, Spain, Switzerland, United Kingdom
Jamaica	9	Argentina, China, France, Germany, Italy, Netherlands, Switzerland, United Kingdom, United States
Mexico	2	Spain, Switzerland
Nicaragua	3	Denmark, Spain, United States
Panama	5	France, Germany, Switzerland, United Kingdom, United States
Paraguay	14	Austria, Belgium–Luxembourg, Chile, Ecuador, France, Germany, Hungary, Netherlands, Peru, Republic of Korea, Romania, Spain, Switzerland, United Kingdom
Peru	22	Argentina, Bolivia, China, Colombia, Czech Republic, Denmark, Finland, France, Germany, Italy, Malaysia, Netherlands, Norway, Paraguay, Portugal, Republic of Korea, Romania, Spain, Sweden, Switzerland, Thailand, United Kingdom
Trinidad and Tobago	4	Canada, France, United Kingdom, United States
Uruguay	15	Belgium–Luxembourg, Canada, Chile, China, France, Germany, Hungary, Italy, Malaysia, Netherlands, Poland, Romania, Spain, Switzerland, United Kingdom
Venezuela	13	Argentina, Barbados, Chile, Czech Republic, Denmark, Ecuador, Italy, Lithuania, Netherlands, Portugal, Spain, Switzerland, United Kingdom

TABLE A3.2
Political risk insurance schemes

	MIGA	*Germany (C&L Deutsche Revision AG)*
Scope of coverage		
Eligible investments	New (including expansion, modernization, and financial restructuring of existing projects). Must promote economic growth and development in the host country and be financially, economically, and environmentally sound.	New (including expansion and modernization of existing projects). Must be sufficiently legally protected (under a bilateral investment treaty, for example) and intensify and foster the relationship with the host country.
Forms of investment	Equity, shareholder loans, shareholder guarantees of third-party loans, loans to unrelated borrowers (project lending), leases, contractual arrangements (licensing, franchising, technical assistance, and management agreements)–minimum three years. Cash, machinery and equipment, consigned inventory, debt-equity swaps, reinvested earnings.	Equity investment (shares in foreign enterprises). Investment-type (long-term) loans, shareholder loans, or loans to unrelated borrowers (project lending). Capital provided to an overseas branch. Cash, machinery and equipment, services, licenses, debt-equity swaps, reinvested earnings.
Eligible investors	Natural or juridical person who is a national of a MIGA member country other than host country or juridical person not incorporated or domiciled in a member country but majority owned by nationals of MIGA member countries.	German citizens and corporations established under German law and domiciled in Germany.
Eligible countries	Developing member countries as host countries and industrial and developing countries as countries of investor. Host country approval required.	Host country, which ensures the legal protection of the investment (by means of a bilateral investment treaty, for example). Some bilateral investment treaties require host country approval.
Risks covered		
Expropriation	Total or partial loss of investment as a result of acts by host government (outright nationalization, confiscation) causing reduced or loss of ownership of, control over, and rights to the insured investment and continue for 1 year. Creeping expropriation covered if a series of acts over time have expropriatory effect. Lawful actions by the host government (exercise of regulatory authority) not covered.	Total loss of part or all of the investment because of nationalization, expropriation, or other interventions or noninterventions by the host government whose effects are similar to expropriation. Creeping expropriation covered if the series of events have the same effect as expropriation (and lead to total loss of the investment).
Convertibility/ Transferability	Acts that restrict investor's or lender's ability to convert local currency returns into foreign exchange for transfer outside the host country for more than ninety days.	Acts that restrict investor's ability to convert amounts paid into a bank account and/or transfer of such amount to Germany for more than sixty days.
Political violence	Damage to or destruction or disappearance of tangible assets caused by politically motivated acts of war or civil disturbance, including revolution, insurrection, coups d'état, sabotage, and terrorism.	Total loss of investment due to actions such as civil disturbance, war and domestic armed conflicts, revolution, or riots.
Breach of contract	Protects against losses arising from host government's breach or repudiation of a contract with investor. In the event of alleged breach or repudiation, investor must be able to invoke an arbitration clause in the underlying contract and obtain an award for damages. If investor has not received payment, MIGA will compensate.	Breach of commitments by host government or government-controlled entities of a contractual (bilateral) or noncontractual (unilateral) obligation covered if politically motivated. Bi- or unilateral "commitments" must be stated in the guarantee document.

Japan (EID/MITI)	*United States (OPIC)*
New (including expansion and modernization of existing projects).	New (including, privatization, expansion, and modernization of existing projects). Must demonstrate a potential for positive effects on U.S. employment and economy, be environmentally sound, promise significant benefits to social and economic development of the host country, and not violate internationally recognized worker rights.
Equity, loans, property rights, surety obligations.	Equity, loans to unrelated borrowers, third-party loan guarantees, construction and service contracts, production sharing agreements, leases, contractual arrangements (licensing, franchising, technical assistance agreements) –minimum three years. Cash, machinery and equipment, consigned inventory, debt-equity swaps.
Japanese citizens and corporations or other institutions established under Japanese law. Domestic investor could be majority owned by foreign individuals.	Citizens of the United States, corporations, partnerships, and other associations created under U.S. law and owned by more than 50 percent by U.S. citizens, foreign corporations owned at least 95 percent by U.S. citizens, corporations, and the like.
Host country's legal system must adequately provide for foreign investment inflows. Host country approval required.	Bilateral agreements must exist. Foreign government approval, which varies between host countries, process is required.
Total loss of investment as a result of acts that deprive the investor of the investment by the host government. Creeping expropriation covered.	Total loss of investment due to acts that are attributable to the foreign governing authority, violate international law, deprive the investor of fundamental rights, and continue for six months. Creeping expropriation covered. Excludes losses due to lawful regulatory or revenue actions by host governments.
Acts that restrict investor's or lender's ability to repatriate funds for more than sixty days.	Acts such as new currency restrictions or failure by exchange control authorities to act on an application for hard currency for more than sixty days (in some cases more than ninety days).
Occurrences such as inability to continue business, bankruptcy or other similar event, suspension of transaction by the bank or similar event, suspension of business for a period exceeding six months, attributable to war, revolution, civil war, riot, or civil disturbance.	Two types of loss compensation coverage are available: business income coverage and assets coverage due to war, revolution, insurrection, or politically motivated civil strife, terrorism, and sabotage. Actions undertaken to achieve labor or student objectives not covered.
Breach by host government of a contractual obligation covered. Suspension of the insured business operations must occur for more than six months.	No specific coverage. Coverage may be provided if requirements for expropriation (total loss) are met and either the insured successfully demonstrates that the actions could not have been justified under the terms of the underlying commercial arrangement or the failure to perform is the subject of an arbitral award in favor of the investor that remains unpaid for three months.

(Table continues next page.)

TABLE A3.2 (CONTINUED)
Political risk insurance schemes

	MIGA	*Germany (C&L Deutsche Revision AG)*
Scope of coverage		
Duration	Minimum three years and maximum fifteen years for equity (twenty years under certain circumstances). For loans, leases, and transactions term is generally equal to duration of the underlying contract or agreement.	Up to fifteen years, with gradual rollovers of five years.
Project/country limits	Project limit is $75 million (maximum coverage ratio of debt (to unrelated borrowers) to equity in the same project is 6:1). Country limit is $325 million.	No prespecified limits; case by case.
Maximum percentage of coverage	Although MIGA has maintained a 90 percent limit, it can insure up to 95 percent of equity investments and up to an additional 450 percent to cover future earnings. For loans and loan guarantees, up to 95 percent of principal and up to an additional 150 percent of principal for interest to accrue over the term of the loan. For technical assistance contracts, up to 95 percent of total value of payments due.	95 percent. Up to 10 percent of annual earnings are eligible, limited to a maximum of 50 percent on the value of the equity/capital investment and 100 percent of the shareholder loans. If reserves are transferred into shares, the coverage can be increased to 300 percent of original investment.
Waiting periods		
Expropriation	Varies, but usually 365 days; 180 days for funds.	None.
Convertibility/ transferability	Varies, but usually 60–90 days.	Sixty days.
Political Violence	None (for direct physical damage); 365 days (if war/civil disturbance prevent project from operating for at least 365 consecutive days).	None.

Source: Responses to questionnaires; *MIGA Investment Guarantee Guide; MIGA Financial Institution Guide* (Second Edition Feb. 1996); Allgemeine Bedingungen für die Übernahme von Garantien für Kapitalanlagen im Ausland (Fassung November 1993); Merkblatt für die

Japan (EID/MITI)	*United States (OPIC)*
Minimum three years; up to fifteen years with possible extension for projects with long construction periods.	Maximum twenty years (equity). For loans, leases, and transactions the term is generally equal to the duration of underlying contract or agreement.
Project limit is Yen 50 b. No country limits.	Project limit is $200 million. Country exposure limited to 15 percent of global portfolio.
95 percent for political risks. 90 percent of earnings up to 10 percent of invested amount and up to 100 percent of principal in total are insured.	90 percent of eligible investment. Loans and leases from financial institutions to unrelated third parties may be insured for 100 percent of principal and interest.
None.	Equity: Six months. Debt: Three months.
Sixty days.	Sixty to ninety days plus (depending on host country).
None (unless business is suspended for six months).	Equity: none. Debt: One month.

Übernahme von Bundesgarantien für Kapitalanlagen im Ausland (Fassung November 1993); *Trade and Investment Insurance in Japan,* EID/MITI; *Program Handbook,* OPIC; Rowat 1992.

Comments on "Covering Political and Regulatory Risks: Issues and Options for Private Infrastructure Arrangements"

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Warrick Smith has laid out a comprehensive set of options facing governments for mitigating risks associated with private infrastructure projects. Peru's experience mitigating these risks may be illustrative.

In a very short time Peru has shed its image as an international pariah and succeeded in attracting massive private investment. While government guarantees have played a role, sound macroeconomic management, especially a strong fiscal stance, accompanied by a transparent regulatory apparatus, has been the key factor accounting for the increase in investment. To repair and reverse the effect of past errors, such as expropriations and debt repudiation, the Peruvian government has worked actively to negotiate with its creditors and to meet all its commitments, thereby helping reestablish credibility and confidence in its economy.

The success of its privatization, through outright sale or concession, is owed partly to the creation of institutions such as COPRI (for outright sales) and PROMCEPRI (for concessions). In addition, before privatization the government sought to ensure that a good regulatory framework and adequate regulatory agencies existed, issues of cross-subsidization were resolved, service prices were raised to reflect their costs, environmental liabilities were recognized ex ante, and legal and tax stability agreements were signed.

To mitigate perceived risk further in light of possible changes in governments and policies, the main challenge facing Peru today is to ensure that its reforms are institutionalized. This can be done by adopting formal and real commitments to the continuation of key policies, such as maintaining an open current and capital account of the balance of payments, diminishing discretionary power over managing the exchange rate and interest rates, and minimizing state intervention in the resolution of labor disputes. Other important measures aimed at the long-term sustainability of the fiscal situation include making contingent liabilities, particularly those of the pension system, explicit and transparent; reinforcing prudential rules on the financial sector; and seeking an adequate profile for debt payments. Adherence to bilateral and multilateral agreements for investment protection will also provide for added stability.

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The strategies for categorizing and describing political and regulatory risks in Warrick Smith's paper are comprehensive and desirable. However, there appears to be an implicit assumption that investors always need to be protected against political and regulatory risk, so that these risks are in effect passed back to the host government, and that the obligations to the host government not to intervene in the enterprise or other-

wise to insulate investors from political risk should in turn be secured by insurance or guarantees.

While risks should in general be allocated to those parties best able to control them, investors in industrial countries routinely accept risks related to changes in the fiscal and regulatory regimes, even though they are under the control of governments. Developing countries should aim to do the same. Investors in private infrastructure projects should not be given preferential treatment to protect against changes that are not aimed at the project per se. However, government assurances for three kinds of project-specific risks may be justified: protection against changes in service standards, protection to ensure that expected new legislation or permissions are forthcoming, and assurances on the extent of competition that would be permitted.

Countries should strive toward having investors and financiers accept political and regulatory risk without guarantees or insurance. But pressures to obtain such guarantees exist because investors need insurance to protect against losses when the size of the potential loss is large and could significantly affect the company's balance sheet. In addition, banks may pressure investors and governments to provide guarantees from multilateral or export credit agencies, as they often do not have to provision against loans that are guaranteed by such entities.

The chapter discusses in detail the case for investment insurance to protect against expropriation, political violence, and currency convertibility, and it describes the role of such multilateral and national agencies as MIGA and OPIC in investment insurance. Export credit agencies deserve more attention. In conventional foreign direct investment MIGA and investment insurance agencies typically cover only against political or economic circumstances that prevent equity holders or lenders from exercising their collateral rights to the enterprise and remitting the proceeds. Commercial risks are not insured. In contrast, in private infrastructure arrangements, export credit agencies such as the U.S. Eximbank cover both political and commercial risks that may prevent the borrower from repaying the loan. The insured parties are the banks that finance the purchase of materials or equipment from the country of the export credit agency concerned (in this example the United States). While export credit agencies provide political cover throughout the life of the project, they try to restrict commercial risk cover to the operating period only.

The commercial (private) market for political risk insurance has grown considerably over the past two years, and its capacity is very large compared with that of multinational and national agencies. Lloyd's of London, for example, can provide insurance of $500–$750 million for a single project, while the American International Group (AIG) can provide single project insurance of $120 million. OPIC's project limit is $200 million, which can be aggregated with its similar limit for loan guarantees. For many years war coverage was not available by private insurers, and periods of coverage were limited to two to three years. Today ten-year cover against expropriation or breach of government undertakings is available. Lloyd's provides currency inconvertibility cover for a shorter period and war cover for eighteen months at a time, while AIG provides war cover for up to ten years. Thus although the commercial market does not represent a complete alternative to the multilateral and bilateral agencies, it is now an increasingly viable option for many projects. Moreover, there is increasing cooperation among MIGA, the national schemes, and the private market.

4
Infrastructure Franchising and Government Guarantees

Eduardo Engel, Ronald Fischer, and Alexander Galetovic

ABSTRACT

Government guarantees for private infrastructure projects reduce the incentives of firms to perform efficiently, weaken the incentives to screen projects for white elephants, and shift government obligations to future periods. Thus the use of guarantees needs to be limited, and they need to be carefully designed.

Franchising schemes should in principle assign risks to the parties best able to manage and control them. The mechanisms by which contracts are awarded should be simple, so that possibilities for evaluator subjectivity are reduced, the award process remains as transparent as possible, and the likelihood of having to renegotiate is minimized.

Infrastructure franchises have usually been awarded on a fixed-term basis. Such contracts expose franchise holders to considerable demand risk, which investors are often unwilling to assume without government guarantees. These contracts are also inflexible, since it is difficult to determine a fair level of compensation to the franchise holder if the contract is terminated early or modified.

Under an alternative mechanism, the franchise is awarded to the firm that asks for the least present value of user fee revenue for a given tariff structure, and the franchise ends when the present value of user fee revenues is equal to the franchise holder's bid. Such contracts reduce the demand risk borne by the franchise holder (and the concomitant demand for government guarantees). They also make fair compensation of franchise holders in the event of early termination straightforward, since the level of fair compensation is equal to the revenue remaining to be collected.

Most developing countries urgently need to make massive investments in infrastructure. Until recently most types of infrastructure were viewed as services that had to be publicly provided. In recent years, however, a wave of privatizations has swept the world, driven largely by chronic budgetary problems and widespread disappointment with the performance of state-owned enterprises.

Privatization has several advantages. First, the public sector often lacks the financial and human resources necessary to undertake needed projects. Second, private firms are usually better run and more efficient than state-owned firms. Third, private participation helps screen projects for "white elephants" (projects with negative net present value). Fourth, cost-based user fees are easier to justify politically when infrastructure providers are private.

Despite these advantages, the experience with private participation in infrastructure provision has been mixed. Privatization of infrastructure often awards a monopoly to a private firm, and it is difficult to regulate the exercise of the firm's market power. Moreover, the sudden creation of large private enterprises may alter a country's political economy. Finally, many infrastructure projects face large commercial and policy risks, which have led their sponsors to press for generous up-front government guarantees or the implicit assurance that they will be bailed out should they face financial distress (implicit guarantees).

Government guarantees have undesirable consequences that may offset the benefits of privatization. First, they reduce the incentives of firms to perform efficiently. Second, they weaken the incentives to screen projects for white elephants (box 4.1). Third, although they reduce current government expenditures, they shift obligations to future periods and administrations. These contingent liabilities are seldom valued, and they are typically not included in the year-to-year budget or counted as government debt. As a result, they are not subject to scrutiny. Moreover, since many of these guarantees may become effective during recessions, they may trigger a new type of debt crisis.

When private infrastructure franchises run into financial trouble, the terms of the contract are usually renegotiated, almost always to the detriment of taxpayers and users of the project.[1] These implicit government guarantees are undesirable for several reasons: they are not accounted for in the budget, they encourage firms with experience in lobbying to underbid in the expectation of future renegotiations, and they have an adverse effect on the public's perception of private participation in the provision of infrastructure.

Firms demand guarantees for various reasons. They may be unwilling to bear the policy risk created by the lack of adequate regulatory reform, or the risk allocation between the regulator and the firm may be inefficient. Neither shortcoming needs to be addressed with guarantees. Once necessary regulatory reform has been undertaken, appropriate contract design can enhance social welfare by distributing risks efficiently, reducing the need for guarantees. Where regulatory reform is not undertaken, guarantees are a poor substitute. To the extent that guarantees accompany privatization and therefore blunt the incentives for efficiency, there is little reason to expect that privatization will improve service or relieve government budgets (box 4.2).

Box 4.1
Poor project screening in Chile

In the mid-1940s, Chile and Argentina decided to integrate their economies. As part of this process, a railway link between Concepción and a port in Argentina was conceived. The Chileans built the line up to the border, constructing the Lonquimay tunnel, the (still) longest tunnel in Latin America, and rail stations along the way. The Argentine line was never built, and the project was never put to its intended use. A private firm would not have begun the Chilean part of the project before it was assured that the Argentine project was under way.

Box 4.2
The role of regulating telecoms in the Philippines

Regulation of the Philippine telecoms system was ineffective because the regulator could exercise discretion and was strongly influenced by the executive. Entry into telecoms was allowed after a politicized and discretionary process, and it proved difficult to enforce interconnections. The system was liberalized in 1995 and since then has shown major gains.

Competition should regulate the provision of infrastructure whenever feasible. If competition can be made to work—because a well-developed market exists or can be designed (as in the case of electricity generation)—private contracts should be left to deal with risk sharing and renegotiation, and no government guarantees are needed (box 4.3).[2] When competition cannot work, regulators should use mechanisms that mimic competition and use direct regulation only as a last resort. This implies that the temporary franchising of infrastructure through competitive bidding should be preferred in principle to the creation of regulated utilities. To date, however, few infrastructure projects have been periodically reauctioned. In some cases the reason is fundamental: when the quality and state of conservation of the assets cannot be verified by third parties (as is the case, for example, with underground pipes for water distribution and sewage), periodic reauctioning of the franchise is inadvisable and a utility is preferable as a means of providing the correct incentives for investment and maintenance.[3] In the case of utilities, no guarantees are necessary provided that regulatory reform credibly commits the government not to act opportunistically.[4] In other cases, however, franchises have not been granted because they appear to be so risky that private firms have refused to participate without generous guarantees by the government against commercial risks.

The creation of competitive markets, such as those in electricity generation and long-distance telephone services, has been widely discussed in the literature. There is also vast literature dealing with the regulation of natural monopolies. In contrast, little research has been done on the use of limited time concessions to provide infrastructure, a case that lies between the extremes of competitive provision of infrastructure and natural monopoly. This chapter focuses on franchises in which initial investments are large relative to both the size of the market and to operating costs, assets are tied to a particular location, and service at a distance is not feasible. Examples of these types of projects include highways, bridges, airport runways, seaport defenses, and water reservoirs. Renegotiation, flexibility, and risk sharing, and their close connection to explicit and implicit government guarantees are particularly important in these types of projects.

Fixed-term franchises are risky because they assign risks inefficiently. This inefficiency arises because the term of the franchise is fixed and independent of the actual realization of demand. Franchise holders assume a major proportion of demand risk; if demand is hard to estimate, they will press the government for guarantees. The new competitive mechanism presented here allocates franchises so that the risk borne by the franchise holder is substantially reduced. Under this mechanism the regulator fixes prices, and the winner of the auction is the firm that bids for the least present value of revenues (LPVR). The franchise ends when the present value of user-fee revenue equals the winning bid. Year-to-year revenues are discounted at a rate known to all bidders before the auction.

In contrasts to mechanisms in common use, in LPVR auctions the term of the lease is not set at the time the franchise is awarded. The franchise lasts longer when demand grows slower than expected, and it expires earlier when demand exceeds expectations. This characteristic reduces the importance of making accurate demand forecasts and reduces the risk borne by the franchise holder and hence the need for guarantees.

A second advantage of LPVR auctions stems from the fact that the winner's bid reveals the income required in order to earn a normal profit. This reduces the scope for post-contract opportunistic renegotiations for two reasons. First, from a political perspective it is more difficult for the government to exploit the franchise holder by changing the original contract, because the winning bid is a clear and observable benchmark that makes it easy to compute any wealth loss borne by the franchise holder. In contrast, with fixed-term franchises it is very difficult to estimate how changes in the term of the contract affect the venture's profitability. Second, it is also more difficult

BOX 4.3
The benefits of deregulation and competition

The annual benefits from deregulation in the airline, trucking, railroad, and telecommunication sectors in the United States have been estimated at $35–$45 billion (Winston 1993). In Chile the long-distance monopoly operator was perceived as having been regulated efficiently. After competition was introduced in late 1994, however, prices of international calls fell more than 60 percent, while demand more than doubled.

for the franchise holder to renegotiate the contract, since any giveaway by the government can be compared with the winning bid. As a consequence, LPVR auctions discourage artificially low bids by opportunistic firms (lowballing), because the regulator can credibly threaten to pay whatever sum remains to be collected and terminate the franchise in the event that the franchise holder attempts to renegotiate.

The fact that the franchise holder reveals the income it requires to earn a normal profit makes LPVR auctions more flexible than their fixed-term counterparts. If the project needs to be reauctioned before the sum is collected, the franchise holder can be compensated simply and fairly by paying the difference between the bid and the revenue accumulated by the time the franchise is canceled.

The only time when arguments for government guarantees may be valid is in the early stages of private franchising, since initial franchise holders may reveal information about the business and any regulatory dangers that benefit later participants. If these externalities are important, it may be appropriate to combine an LPVR auction with a government guarantee that is a fixed fraction of the winning bid. Other things being equal such guarantees imply smaller government liabilities and provide less scope for opportunistic behavior by the franchise holder than those currently in use.

A fundamental assumption underlying the analysis in this chapter is that franchise holders are unable to diversify a large fraction of the project-specific risk they face. If project-specific risks could be diversified there would be no demand for government guarantees. Yet private firms and financiers usually refuse to participate in franchise auctions for infrastructure projects unless governments pledge guarantees. The demand for guarantees is not restricted to countries where policy risks are large and regulatory frameworks weak, but appears also in countries where only commercial risks exist. Even though the empirical fact described above is well established, at this point we have no satisfactory theoretical explanation for this phenomenon. Presumably, agency problems in infrastructure projects require franchise-holders to be highly exposed, yet this topic is beyond the scope of this paper.

The remainder of the chapter is organized as follows. Section 2 reviews the usual arguments in favor of guarantees for private infrastructure projects and classifies the risks that generate the demand for guarantees. Section 3 develops a conceptual framework for the analysis of the design of franchise contracts. Section 4 uses this framework to analyze fixed-term contracts and argues that they create a demand for guarantees. Section 5 presents LPVR auctions and shows that they significantly reduce the risk borne by franchise holders and hence the need for guarantees. The last section summarizes the chapter's main conclusions.

Government Financing of Private Infrastructure

Governments provide financial support to infrastructure projects in various ways:

- Funding it completely, by providing lump-sum funding of construction projects, a practice common in many countries
- Providing guarantees against different types of risks, such as demand risk, convertibility and devaluation risk, commercial risk, and policy-induced risks
- Subsidizing the project up front
- Providing loans at subsidized rates
- Becoming a partner in the project.

Since most firms participating in infrastructure projects are cash constrained, equity financing is impossible and debt finance is needed. At least during the construction phase, financing is usually provided by banks, which are extremely risk averse, partly because they are penalized by regulators if they carry nonperforming loans and partly because they do not share in the upside gain if the project is successful.[5] Regardless of the risk premium offered to them, they are unwilling to provide funds if the probability of repayment falls below a certain threshold (say, 80 percent). For this reason firms participating in infrastructure projects, which are inherently risky (at least under present franchise mechanisms), press for government demand guarantees in order to gain access to bank finance.[6]

Costs of Guarantees

Guarantees defeat the purpose of private franchising for several reasons. First, they reduce the incentives to

screen projects carefully (box 4.4). Second, guarantees blunt incentives to operate efficiently. When the government guarantees against cost overruns, for example, costs tend to exceed the original estimates. Assuming some types of risks increases the incentives of the franchise holder to be efficient. Third, guarantees create contingent liabilities—either explicit or implicit—for the government (box 4.5). These are seldom valued and are typically not included in the year-to-year budget or counted as government debt. Thus they are not subject to scrutiny. Finally, since guarantees often become effective during recessions, they may trigger a new type of debt crisis.

Arguments in Support of Guarantees

Governments may legitimately offer subsidies, such as guarantees or budgetary support, to private infrastructure projects in which externalities exist or in which the government may be able to obtain financing at a lower cost than the private sector.

Positive externalities. There is a role for government intervention when the externalities associated with the infrastructure project lead to positive net social benefits but negative private benefits (box 4.6). A subsidy just large enough to make the project attractive to private investors would allow the project to be franchised as usual. The incentives to screen the private profitability of the project would remain in place, although the firm's value at risk would be smaller than if it had to finance the project itself.[7] Subsidies have the additional advantage of running through the normal budgetary process, so that they face scrutiny and must compete with other items in the government's agenda. In comparison, demand guarantees normally face no such screening and lead to potential liabilities for future administrations.

The process by which a subsidy is fixed is delicate. Political pressures may lead to subsidies that are more generous than is necessary to attract private investors. In a worst-case scenario, projects that are not welfare enhancing may be built.

Guarantees may be justified in the early stages of the private franchising process. Initial franchise holders generate learning externalities about the long-run viability of the system. In this case a contingent subsidy paid only if the franchise business is not viable provides adequate incentives and compensates initial franchise holders for the learning externalities they generate. These guarantees should be phased out as soon as learning externalities are exhausted. Moreover, before guarantees are provided their aggregate value at risk should be estimated and subject to standard budgetary approval procedures.[8]

Governments' lower cost of capital. As Klein (1996) convincingly argues, there are many reasons to doubt that the true cost of sovereign debt is lower than the rates obtained by private firms. For the sake of argument, however, assume that this is indeed the case, and assume that the government is willing to incur sovereign debt for the private provision of infrastruc-

BOX 4.4
Weakened incentives for project screening for the San José Lagoon Toll Bridge

The San José Lagoon Toll Bridge was built to relieve congestion in the San Juan region in Puerto Rico. The government assumed most of the commercial risk by guaranteeing to buy back the project at the concessionaire's request if traffic fell short of 80 percent of projections during the first three years and 100 percent of projections after nine years. In the event of a buy back, the government would reimburse the concessionaire for all project costs and pay it a 13 percent return on its investment. Under this badly designed guarantee scheme the concessionaire has few incentives to screen the quality of the project.

BOX 4.5
The high cost of implicit guarantees in Mexico

In the late 1980s and early 1990s Mexico franchised the construction and operation of about 5,000 kilometers of highways. Most franchise owners faced financial distress when demand forecasts turned out to be overly optimistic. This led to renegotiations of the original agreements between the government and the franchise owners that extended some of the leases to more than twice the original term and pumped in more than $6 billion of government funds to save the firms (and the banks that lent to them) from bankruptcy.

BOX 4.6
Subsidizing the Pan-American Highway in support of social goals

The Chilean government has divided the Pan-American Highway, which runs through the country from north to south, into nine sections, which are being auctioned separately. Motivated by the externalities associated with decentralization (and possibly also by political considerations), the government plans to levy similar tolls at all nine sections, despite the differences in traffic flows. In low traffic volume sections, which are unattractive to the private sector, the government will subsidize the winning firms. These subsidies are expected to be financed by fixed payments to the government from the holders of the sections with high traffic volumes.

ture. What is the best way to use these funds to finance infrastructure?

As long as the advantages of private sector participation continue to hold, there is no reason why the government should build or operate infrastructure. Two schemes can be used to transfer the lower cost of capital to the private sector.

Under the first scheme, the government can invite the private sector to bid on construction of the project. The winning firm is the firm that satisfies the minimal technical requirements and requests the lowest lump sum to build a project. If the government wants a private firm to operate the franchise, it can set up a second auction for this purpose. This type of scheme faces potentially serious problems, since it includes no market-based incentives to screen projects and political opposition may prevent the government from charging the efficient user fee. Since governments usually lack the backbone required to resist political pressure, this can be a serious danger.

An alternative approach is to develop a scheme for second-tier banking in which the government offers a credit line (at a rate reflecting the government's lower cost of funds) to banks, which in turn provide funding for BOT infrastructure projects. Firms negotiate loans with the banks in the knowledge that the banks have access to cheap, subsidized credit. The supposed advantage of this scheme is that banks will screen the quality of projects and bidders and that competition between banks will transfer the lower loan rate to bidders. The scheme is equivalent to the standard franchise scheme, except that the loan rate is lower. The choice between the two schemes depends on the percentage of the debt that must be covered by guarantees and on the supervisory ability of the government.

Principles Governing the Design of Franchising Schemes

Allocation mechanisms should maximize the sum of user and franchise holder surpluses.[9] It follows from this principle that the regulator should prevent the exploitation of any monopoly power and that the most efficient firm should be assigned the franchise in a competitive auction. In addition, most governments in developing countries want the private sector to finance the costs of building new infrastructure. This means that terms must be long enough for a normal profit to be earned on investments.

An auction mechanism is a set of rules that indicates how the winning bid is chosen. It determines the franchise holder's obligations, regulates the monopolistic exploitation of the franchise (by fixing a maximum price for the service or by sharing income with the government for example), and determines how risks, profits, and losses are shared among the franchise holder, users, and taxpayers. According to standard theory any open and competitive auction guarantees social efficiency. In practice uncertainty, incentive problems, and the possibility of renegotiation mean that different types of open and competitive auctions may differ substantially in their welfare implications.

Franchise contracts are difficult to design because in many cases demand forecasts are highly uncertain, sunk investments are large, and it is costly for the state to switch to another supplier after the contract is awarded. They are thus subject to what Williamson (1985) has termed "the fundamental transformation": before the auction the relationship between firms and the state is competitive; after the contract is awarded it becomes a bilateral monopoly. Because the venture's profitability depends on events that cannot be anticipated, franchise contracts are inherently incomplete

Box 4.7
Opportunistic behavior by the French government

After the first oil shock in 1973 the French government was reluctant to let highway tolls rise, because it wanted to control inflation. The government simply ignored provisions in the toll road franchise contracts that stipulated that private concessionaires could fix tolls at will. Concessionaires sued and lost after the court ruled that a 1945 law gave the government the power to fix any price (see Gómez-Ibáñez and Meyer 1993).

and there is ample room for opportunistic behavior on both sides (box 4.7)

In designing and evaluating an auction mechanism and its associated franchise contract, several principles should be followed, as shown in the following sections.

Allocate Risks Efficiently

A franchise contract spreads the risks of an infrastructure project among the franchise holder, users, and taxpayers.[10] Since the ex post risk premium required by a franchise holder rises with the variability of returns, everything else equal the chosen mechanism should transfer risks to the party best able to diversify them and minimize the total level of demand risk.[11] This principle is subject to one major qualification: controllable risks should be borne, at least in part, by the party best equipped to control them, since parties have fewer incentives to be efficient when they do not bear a risk they can partially control. If the regulator grants complete insurance against cost overruns, for example, the franchise holder has no incentive to control costs, and on average they will be too high. Thus, any risk that cannot be controlled or eliminated should be diversified.

In principle, transferring uncontrollable risk to taxpayers is efficient and largely eliminates its costs. The reason, as Arrow and Lind (1970) demonstrate, is that when large uncontrollable risk that is uncorrelated with taxpayer's wealth is spread among many taxpayers the aggregate risk premium is negligible.[12] But as Klein (1996) argues, the government must have incentives to avoid white elephants for this argument to hold, which is often not the case. Severe agency problems that deter private investors from investing without guarantees are likely to be encountered by the government as well. In this case, shifting risk to taxpayers is inadvisable, since it will force them to pay for bad projects. An alternative is to shift risk to the users of the project. If there are many users and the conditions assumed by Arrow and Lind apply, risk allocation can be efficient. Since users pay only if they use the infrastructure, agency problems are less severe.

Demand risk. Demand risk arises when demand forecasts are unreliable. This risk is compounded when firms have little flexibility to adapt to unforeseen demand scenarios, as is the case in many types of infrastructure projects, in which investments are large relative to the size of the market, indivisible, and tied to a particular location and service at a distance is not feasible.

Demand forecasts are based on estimates of both macroeconomic risks, which are tied to the aggregate performance of the economy, and microeconomic risks, which reflect local demand fluctuations. Errors in either estimate will throw off forecasts of demand, which are usually inaccurate in the short term (three to five years) and all but useless in the long term (box 4.8).

Construction and operating risk. Construction and operating risk exists because the costs of building and maintenance generally differ from projections. These risks should be borne by the franchise holder, because building costs and diligence in operating are known and controlled only by the franchise holder and cannot be observed by the state and users.[13]

Policy risk. Many private infrastructure projects are subject to policy-induced risk, which may take two forms. Actions by different government agencies may unintentionally affect the profits of the franchise. A tightening of policy by the central bank, for example, may cause a recession that significantly reduces demand growth, or a change in environmental standards may require additional investments. In these cases the government is not acting opportunistically, since these policies are not intended to affect the prof-

BOX 4.8
Forecasting demand for toll roads in Chile

The table below shows the rates of growth of the number of motor vehicles paying tolls during the last decade on three of the main toll roads in Chile. Macroeconomic risk is reflected in the fact, for example, that vehicle flows in the three roads grew much faster during 1987 than in 1990. Microeconomic risk is apparent in most years: the growth of vehicle flow fluctuates considerably from one road to another. It should be stressed that, macroeconomically speaking, the past ten years have been Chile's most stable during this century: there have been no recessions, and GDP has grown 6 percent a year. Despite this, traffic growth rates have fluctuated considerably.

Vehicles paying tolls: Growth rate
(percentage)

Toll road	*1986*	*1987*	*1988*	*1989*	*1990*	*1991*	*1992*	*1993*	*1994*
Angostura	8.8	15.0	11.7	4.5	8.7	12.4	6.7	7.8	9.4
Zapata	21.5	14.4	13.1	8.1	7.2	5.2	2.9	3.9	4.9
Lampa	3.8	13.4	15.9	8.9	6.8	18.0	8.8	16.2	12.5

Note: Growth rates refer to the growth in the flow of vehicles from one year to the next.
Source: Ministry of Public Works, Chile.

itability of the franchise. These risks are not controlled by the franchise holder and should be diversified.

A second class of policy risks occurs when the government alters policies with the intent of affecting the profitability of the franchise holder. The government may build or expand infrastructure that competes with the franchise and charge subsidized user fees, for example, or it may reduce user fees in response to political pressures. These risks should be eliminated by adequate and credible regulatory reform that constrains government opportunism. Guarantees are a poor substitute for regulatory reform, not least because of the dubious value of a guarantee provided by a government that cannot commit not to act opportunistically (box 4.9).

In some circumstances the government may wish to retain flexibility to react to unforeseen events, which may require specifying that certain actions are allowable under the contract. The franchise contract should be designed to reduce the impact of policy changes that cannot be anticipated.

Do Not Depend on Information Provided by the Franchise Holder

In order to determine whether the franchise holder complies with the terms of the contract, the regulator needs information. Since the franchise holder has an incentive to provide misleading data, all information obtained from the franchise holder should be independently verified. Independent confirmation that the terms of the contract are being met restricts the possibilities for opportunistic behavior by the franchise holder or the opportunistic exercise of discretion by the regulator and reduces the likelihood of disputes.

BOX 4.9
The impact of policy changes on the Dulles Highway franchise in the United States

The $347 million Dulles Greenway is a four-lane, private access road from Dulles Airport near Washington D.C., to Leesburg, Virginia. The 14.5 mile long highway is the first private toll road developed in the United States in the twentieth century.

Revenues from the project have been far lower than projected. Two independent traffic consultant companies predicted a daily flow in 1996 of 35,000 vehicles paying an average toll of $1.75. By March of 1996 the average number of vehicles per day was only 8,500. Lack of traffic is mainly due to good competitive free highways and resistance to tolls. Once tolls were lowered to $1, traffic rose to 25,000, still below predictions. It may take five years to get to the break-even level. Worse yet, there are plans (fueled by political pressures) to expand competitive toll-free roads, breaking the oral agreement between the operating company and the state authorities. Such an expansion probably implies that the Dulles venture will never earn a profit (Di Marco 1997).

It follows from this principle that the regulator should not attempt to limit the franchise holder's profits, since doing so would require data on the cost of building and operating the franchise, which are likely to be difficult to verify independently. Quality standards in infrastructure projects should, however, be specified when they are easily verifiable (for example, an airport runway).

Design Simple Auction Mechanisms

Auction mechanisms in many countries depend on many variables, which makes them difficult to analyze and can lead to complaints of evaluator bias. Complex mechanisms are typically not transparent, enlarging the scope for discretion by the regulator and for opportunistic behavior by the franchise holder.

In order to reduce the scope for evaluator subjectivity, factors used in multifactor point rating systems should be quantifiable. Even when they are quantifiable, however, the weights assigned to different factors are to some extent arbitrary, and they can lead to unanticipated outcomes, thereby increasing uncertainty. Furthermore, complex mechanisms are typically not transparent, enlarging the scope for discretion by the regulator and for opportunistic behavior on the part of the franchise holder.

Regulators usually accept complexity in an effort to satisfy the different parties with stakes in the franchise. For example, planners may link an auction with minimum demand guarantees to a profit sharing system between the state and the franchise holder under which the state would benefit if the returns exceed a predetermined limit. Such a system makes it difficult for potential bidders to estimate the value of the project and requires a sophisticated monitoring system.

Another problem with complex contracts is that supervision is more difficult and there may be a lack of coherence between different provisions of the contract, leading to the possibility of renegotiation (box 4.10). The problem with renegotiation is that it substitutes an ex post bilateral monopoly for an ex ante competitive situation, and taxpayers or the public end up as losers. Moreover, the results of the renegotiation process can easily lead to charges of corruption and improper discretion, which may deter participants in future franchises. Finally, complex contracts hinder the public's ability to understand what has been awarded in the auction.

Eliminate Monopoly Rents through Competition

Where no substitutes exist for a franchise—as is often the case for seaports, airports, tunnels, bridges, and roads—an auction awards a monopoly. Where a monopoly is awarded, the regulator should prevent the exploitation of monopoly power, since a monopoly does not maximize social welfare (unless it can price discriminate perfectly) and monopoly rents redistribute wealth from users to the franchise holder. The auction mechanism should eliminate monopoly rents, so that users do not pay more than the minimum required to make the franchise attractive to private investors.

Where fixed-term franchises can be awarded (that is, where the state of the assets at the end of the franchise is observable), the social cost of a monopoly can be eliminated by awarding the franchise in an open

BOX 4.10

Pressure to renegotiate the complex contract for the El Melón tunnel in Chile

In 1992 the Chilean government announced a BOT auction for the El Melón tunnel, on the Pan-American highway. Project costs were estimated at $40 million. Only companies whose projects satisfied minimum technical standards could bid in the final stage of the auction. The scoring formula included seven variables with different weights: annual subsidy by or payment to the state by the franchisee, toll level and structure (composed of six different tolls, with different weights for different classes of vehicles); length of the franchise; minimum income guarantee from the state; degree of construction risk borne by bidders; score on the basis of additional services; and CPI adjustment formula.

The outcome of the auction was unexpected. The top two bids offered the maximum toll, and the award was decided mainly on the basis of the payment to the state. The tunnel was built on time, but the franchise owner has been pressing for a renegotiation in which tolls are reduced in exchange for a lower payment to the state. This would lead to an efficiency gain but would establish the precedent that contracts can be renegotiated at the franchise holder's request. So far the Chilean government has resisted pressure to renegotiate.

and competitive auction, since competition to obtain the franchise will dissipate economic rents (Demsetz 1968).[14]

Provide Incentives for Marketing and Maintenance

The franchise holder can often undertake activities that increase the demand for the infrastructure or increase the efficiency of operation of the franchise. A train company can provide good and reliable service, a telephone company can develop and introduce new services, and an airport can invest in a radar system that allows planes to land in low visibility.

The importance of this factor in different project settings will influence the choice of an auction mechanism. When demand is inelastic and unresponsive to the actions of the franchise holder, no purpose is served in forcing the franchise holder to bear demand risk. In this case demand risk should be diversified, and the regulator should impose and enforce minimum quality standards of service. Projects falling into this category include roads, tunnels, and water distribution, which have no close substitutes. Where users have access to alternative sources for the services of the infrastructure project and demand may be highly sensitive to the quality of the service, the franchise holder must be given incentives to perform demand-enhancing activities, which implies the need to bear commercial risk.

The franchise holder should also be given incentives to maintain the infrastructure in good condition. When there are no close substitutes for the services provided by the infrastructure project, the regulator must define and enforce objective standards of quality of service. The regulator should consider other options, such as indefinite concessions, when it is not feasible to verify the quality of assets. In addition, the regulator should demand guarantees to safeguard users' interests in case the franchise holder does not meet the required quality standards. Incentive problems are particularly severe toward the end of the franchise, because the franchise holder has little to gain by spending on maintenance. It may become necessary to have the franchise holder post guarantees that are redeemable if the state of the infrastructure does not meet previously established quality standards at the end of the franchise.

Avoid Opportunistic Renegotiation

Contracts are often renegotiated when the project turns out to be less successful than the franchise holder expected, and losses are eventually absorbed by the state or by users (box 4.11).

Renegotiation is undesirable not only because of the wealth transfers involved but because it creates incentives for firms with more lobbying power to underbid (lowball) more efficient firms in the expectation that terms will be renegotiated in their favor in the future (Williamson 1985). A commitment by the state to let the franchise go bankrupt would prevent this problem. In most developing countries such a commitment would not be credible, however, since the state is generally unable to withstand pressures from interest groups. A wave of populism can also lead to regulatory opportunism and creeping expropriation.

BOX 4.11

Renegotiation and government bailouts for unsuccessful toll road projects in France, Mexico, and Spain

Renegotiation of contracts and government takeovers of bankrupt franchises have taken place in France, Mexico, and Spain. France awarded four private toll road concessions in the early 1970s. After the oil shocks three of the four went bankrupt and were taken over by the government.

In Mexico virtually all the highway concessions were renegotiated after costs exceeded expectations while revenues were lower than expected. The (declared) cost to taxpayers has reached $6 billion, not including the cost to users of extensions of terms, which more than doubled in several cases. Cost overruns were caused partly by the fact that the companies made their profits by inflating construction costs, siphoning funds through the building companies, and letting the operating companies go bankrupt.

In Spain twelve toll road concessions were awarded before 1973. Building costs ended up being four to five times higher than expected, and traffic was one-third of projections in several of the franchises. Three firms went bankrupt, two others were absorbed by stronger franchise holders, and all firms were granted toll increases and term extensions.

To prevent lowballing, renegotiation should be discouraged, and constraints should be placed on their outcomes, should they occur.

Design a Flexible Contract

While it is desirable to prevent opportunistic renegotiations, some circumstances warrant modification of the original contract. For example, it may be desirable to increase the service capacity of the infrastructure before the end of the franchise period.[15] Alternatively, user fees may turn out to have been set too high (concessions may last more than twenty years), or demand may increase and a higher user fee may be required to allocate existing capacity efficiently. Substantial inefficiencies can result if the contract specifications cannot be changed.

Planners face two options when a contract requires modification. The original contract can be renegotiated with all the problems associated with bargaining under a bilateral monopoly (box 4.12), or the concession can be canceled and the franchise holder compensated for the profits forgone (box 4.13). The problem with the second option is that the fair compensation due to the franchise holder (the expected present value of future profits had the concession continued on the original terms) is subjective and open to dispute.

Fixed-Term Contracts

Infrastructure franchises have usually been awarded on a fixed-term basis.[16] The main defect of fixed-term mechanisms is that the franchise holder must assume a large fraction of the demand risk. A franchise may lose money because the franchise ends before user fees cover for investment costs. If the auction is competitive and no guarantees are pledged, firms will make bids that lead to normal profits on average. Since returns are uncertain, franchise holders will ask for a risk premium, so that profits made if outcomes are good more than compensate for losses in case of bad outcomes. This risk premium is paid by users. In theory, financiers should be able to diversify all project-specific demand risk, so that firms will not ask for a risk premium when they participate in the auction. In practice, however, financiers have refused to participate in auctions unless governments pledge guarantees.

The second shortcoming of fixed-term franchises is that they increase the demand for renegotiation or implicit government guarantees. First, they increase the likelihood that the best bid will be made by the firm that is most optimistic in predicting future demand for the infrastructure (the "winner's curse"), since optimistic estimates lead to aggressive bids when the term of the franchise is fixed. Second, fixed-term mechanisms encourage underbidding (lowballing) by firms that are good renegotiators and lobbyists.

A third shortcoming of fixed-term franchises is that contracts are inflexible, because it is difficult to specify fair compensation for any modifications to the original terms. Since the fair compensation is the expected profit that the franchise holder would have earned over the remainder of the franchise had the original terms of the franchise contract remained in force, any estimate of these profits can be challenged. Where a challenge is made, compensation is usually

Box 4.12
Inadequate provisions for renegotiation of toll road contracts in Argentina

An example of an incomplete contract that allows renegotiations to take place is toll road contracts in Argentina. They state that "... in case of a substantial and sustainable increase in traffic volume, larger than initially estimated, the concessionaire and the government may conceive a plan to improve the levels of service."

Box 4.13
Compensation disputes over terminations of airport concessions in Argentina

The government of Argentina wants to end the present airport franchises in order to reauction them under new terms. To do so the government must compensate the present franchise holders. According to former Economics Minister Domingo Cavallo, government employees, swayed by the franchise holders, have written a decree that provides compensation of $400 million—ten times the estimated level of fair compensation (*El Mercurio* 6 February 1997).

decided in bilateral negotiation, in which political clout can be very important.

Finally, if franchises are allocated to the bidder offering the lowest user charge, the regulator loses a large part of its ability to fix user fees based on efficiency criteria so as to correct externalities.[17]

Fixed-term mechanisms have one important virtue: they provide powerful incentives to increase demand, since the franchise holder appropriates the marginal income generated by its effort. Where consumers have substitution possibilities and demand is very responsive to the actions of the operator, this feature is important.

Least Present Value of Revenues Auctions

A new mechanism for auctioning infrastructure franchises is proposed that reduces the need for government guarantees. Its distinctive feature is that the franchise term is variable, adjusting automatically to realized demand. In its pure form the mechanism includes the following features:

- The regulator fixes the user fee that the franchise holder can charge.
- The franchise is awarded to the firm that asks for the least present value of user fee revenue (LPVR).
- The franchise ends when the present value of user fee revenue is equal to the franchise-holder's bid.
- The rate used to discount user fee revenue is part of the franchise contract and is determined by the regulator before the auction takes place; it should be a good estimate of the rate faced by franchise holders and may be variable (such as LIBOR plus a fixed risk premium).

In addition, it is desirable to establish minimum quality standards, to have those standards enforced by an independent agency, and to impose appropriate fines on firms that do not comply.

To see how the mechanism works, consider an auction in which two firms take part. The first firm estimates its costs at $100 million and asks for a present value revenue of $112 million. The second estimates its costs at $99 million and asks for $110 million. The second firm wins the franchise and operates it until the present value of user fee revenue equals $110 million. Once this amount is collected the franchise ends.

LPVR auctions are often superior to fixed-term franchises, as shown in the following sections.

Demand Risk

By making the length of the franchise responsive to demand, LPVR auctions significantly reduce the demand risk borne by the franchise holder relative to fixed-term franchises. Under a fixed-term contract a franchise holder can lose money even if the franchise would have been profitable in the long-run, if the franchise term is too short. In such a case extension of the term of the franchise would have enabled the franchise holder to earn a normal profit. An LPVR auction reduces the risk borne by the franchise holder by automatically lengthening the franchise term when demand grows more slowly than expected and shortening the term when it grows more rapidly than expected. Since ultimately franchise owners receive (and toll users pay) similar amounts whether demand outcomes are better or worse than estimated, with LPVR auctions the risk premium required by the franchise holder is smaller, and users pay less in expected value over the life of the franchise. These savings could be substantial. In Chile, for example, it has been estimated that user fee revenues on toll roads would fall 33 percent, saving users $800 million, if LPVR auctions were used instead of fixed-term franchises (Engel, Fischer, and Galetovic 1996).[18] Transferring risk to users unambiguously enhances welfare as long as the project-specific component of risk is significant.[19]

An additional advantage of LPVR auctions is that they reduce the chance that the firm making the most optimistic demand estimate will fall victim to the winner's curse, because the impact of demand forecast errors is smaller. When the term of the franchise is fixed, an optimistic demand estimate translates into an aggressive bid (a low user fee or a short concession term). In contrast, under LPVR franchises firms fix their revenues in present value when they choose their bids; winning the auction by being too optimistic means that the franchise will end later than expected, not that total revenue will be lower.[20] Reducing the

likelihood of the winner's curse means that bidders will ask for a smaller expected present value equivalent over the life of the franchise. Because bids in LPVR auctions depend more on investment costs and less on demand estimates, such auctions are more likely to award franchises to the most efficient construction firm.

LPVR auctions reduce the risk borne by the franchise holder, but they do not eliminate it completely. The franchise holder assumes construction, maintenance, and operating cost risks, all risks that are unverifiable and under the control of the franchise holder. Since the present value of operation and maintenance costs varies with the term of the franchise, the franchise holder has an incentive to perform activities that raise demand for the services provided by the project. These incentives are lower than under a fixed-term franchise, however. This is not a serious disadvantage in cases in which the franchise holder can do little to increase demand. Even an indefinite franchise may not be sufficient to pay for the cost of building the infrastructure; that is, the project may turn out to be a white elephant. Allowing franchise holders to bear the risk of investing in a white elephant is a desirable feature of the auction mechanism, since it forces them to screen potential investment projects carefully.

Renegotiation, Discretion, and Modification of the Contract

Another advantage of LPVR franchises is that as long as the auction is competitive the firm's bid reveals the revenues required to earn a normal profit. Thus, a fair compensation for early termination of the lease is the revenue remaining to be collected.[21] This feature has important benefits. First, suppose that before the franchise ends the regulator decides that increased demand requires that the infrastructure be enlarged. Under a fixed-term auction there is no easy way to assign the costs of the expansion, since negotiations take place under conditions of bilateral monopoly—precisely the situation that competitive auctions try to avoid. If instead, the lease is terminated, the government faces the difficult problem of determining how much compensation it must pay the franchise holder. Under an LPVR franchise the regulator pays the fair compensation and no renegotiations are necessary.

In addition, the existence of an observable fair compensation makes it more difficult to expropriate the franchise (or even to use regulations to impose a creeping expropriation). When the term is fixed it is difficult to estimate the wealth loss incurred by the franchise holder if the franchise is expropriated, making it is easier for the government to argue that the compensation offered implies no loss or that the franchise holder has earned "excessive" profits. Under an LPVR auction the franchise holder's bid is a clear, observable benchmark that can be used to challenge any attempt at opportunistic expropriation. Moreover, in the event that the franchise holder wants to renegotiate, (say, because of cost overruns) the fair compensation serves as a standard of comparison that helps stiffen the backbone of the regulator against pressures from the franchise holder. LPVR auctions also discourage underbidding (lowballing) by opportunistic firms.

Note also that common forms of renegotiation are ineffective in an LPVR auction. Raising user fees has the effect of shortening the lease but does not increase the franchise holder's revenues; lease extensions have no meaning in the context of LPVR auctions, since by definition the term is variable.

Optimality Properties

LPVR franchises enable the regulator to separate the process of setting user fees from the process of allocating the franchise. LPVR auctions thus make it much easier to change user fees if they prove inadequate. If operation and maintenance costs are small relative to sunk initial investment, user fees can be adjusted optimally to reflect demand conditions, since the effect of changes in user fees is reflected in changes in the length of the franchise and the effect on profits is small.[22]

It is easy to show that an infrastructure project franchised under an LPVR auction that is operating at capacity and subject to congestion can achieve a first-best solution if user fees are set at the optimal level (see Engel, Fischer, and Galetovic forthcoming for a formal proof). To see why, suppose there are two possible demand states, high and low demand, and that in both states the present value of revenues is sufficient to

recover the investment cost if user fees are set optimally and the franchise lasts long enough. If tolls are set optimally, the franchise holder will recoup its investment in both states and a first-best solution will be achieved.

Government Guarantees

Guarantees may be justified in the early stages of a franchising program, when initial franchise holders generate learning externalities that benefit followers. Since even under an LPVR concession the franchise holder may lose money if demand is so low that the initial investment and operating costs cannot be recouped even over a very long period, a guarantee may be warranted. The value of the guarantee should be a fraction of the present value of revenue requested (say 70 percent), so that the absolute amount of the guarantee is chosen by the franchise holder and competed for in the auction.[23] These guarantees should be removed as soon as the information generated by early participants is revealed.

Financing

Some critics of LPVR franchises have suggested that since variable-term debt contracts are not common, financing could be more expensive. In fact, the opposite is true, since LPVR auctions reduce the risk borne by financiers substantially, as the following example shows.

Assume two identical infrastructure projects, costing $1,500 to build and nothing to operate, and assume that the high demand (200 units each year) and low demand (100 units each year) scenarios are equally likely. The regulator fixes user fees at $1 per unit and for simplicity assume that the discount rate is zero.

In the first project the term of the franchise is fixed and independent of demand realizations, and the franchise is allocated to the firm asking the shortest term. If firms are risk neutral, the winner would offer a term of ten years (1/2 [$200 x 10] + 1/2 [$100 x 10] = $1,500). If firms are risk averse, however, they will require a longer term, (say, twelve years). In that case, if demand is high, the franchise holder earns a profit of $900. If, however, demand is low, the franchise holder loses $300. The second project is awarded in an LPVR auction. Regardless of its degree of risk aversion, the winner will ask for $1,500 because it can cover its costs in both states of nature. Economic profits are zero, regardless of the state of demand.

Consider the problem from the perspective of lenders. For the sake of simplicity, assume that lenders are willing to lend only if the probability of default is zero. Under a fixed-term franchise, revenues will be at least $1,200 with certainty. Thus debt holders will lend more than $1,200 only if a guarantee is given. In contrast, under an LPVR auction, financiers would be willing to lend up to $1,500.

As long as debt finances less than $1,200 lenders can be sure that they will receive at least $100 a year under both mechanisms. In both cases early payment could be made if demand turns out to be high. Thus the safety of the loan does not depend on the mechanism chosen, since lenders are senior claimants and receive all cash flows even when demand is low, regardless of the auction mechanism used.

Guarantees are equally attractive to lenders under both mechanisms, but the LPVR auction is more attractive in terms of social welfare, since shareholders assume much less risk. If, for example, 80 percent of the project is financed with debt and 20 percent with equity and the government guarantees the debt, equity holders lose all their investment when demand is low. In contrast, equity holders experience no losses under an LPVR auction (although they face uncertainty as to when they will recoup their investment) (box 4.14).

Three implications follow from this analysis. First, guarantees are less important when a franchise is allocated by an LPVR auction. Second, even if the government pledges the same guarantee under both mechanisms, its expected outlays will be smaller with an LPVR auction, because guarantees will be exercised less often. Third, equity holders assume much less risk with an LPVR auction, which implies that the risk premium they demand to participate is smaller, that opportunistic renegotiations will occur less often, and that users of the infrastructure will pay less on average.

Term Extension

The value of term extensions in reducing risk has been questioned on the grounds that typical discount rates

BOX 4.14

Using an LPVR-like mechanism to finance construction and operation of bridges in the United Kingdom

In 1987 the British government franchised the construction and operation of the Queen Elizabeth II Bridge that crosses the River Thames in Essex County. The winning consortium of Kleinwort Benson, Trafalgar House, Bank of America, and Prudential Assurance was chosen in part because of its innovative financing package (which would be suitable for financing projects concessioned under an LPVR auction). While the demand for bridge crossings was uncertain, there was little doubt that the project was financially sound provided that the franchise term was long enough. The concession was thus designed to end after twenty years or as soon as toll income is sufficient to repay principal and interest, whichever occurs first.

The project relied 100 percent on debt financing. The four members of the consortium formed the Dartford River Ltd., with nominal capital of just £1,000 and debt of £190 million provided by the members of the consortium. Dartford River Ltd., pays no dividends and allocates all its net cash flow to pay back debt and interest. The bridge was inaugurated in October 1991, and the franchise is expected to end after only eight years.

In 1992 construction work started on the Second Severn Crossing, the second bridge on the Severn estuary at the English Stones site (nominal capital of £25,000). The bridge was inaugurated in July 1996. The financial structure was similar to that of the Queen Elizabeth II bridge. The revenue that the franchise holder is allowed to collect is fixed, so that the concession ends as soon as the sum is collected, with a maximum franchise term of thirty years. "If the contingent concession length had not been allowed, extra risk would have been transferred to the project's cost of capital, and banks may have been less prepared to take on financing risks" (Jones, Zamani, and Reehal 1996).

in project financing range from 10 to 15 percent, so that cash flows twenty to thirty years into the future are not very valuable. This argument has less force than might appear at first sight. First, discount rates increase with the risk of the project. The typical high discount rates observed in infrastructure projects correspond to fixed-term franchises, which are inherently risky for the franchise holder. Project discount rates should be lower in an LPVR auction. Second, in most infrastructure projects demand grows over time at rates similar to those of GDP, and risk-free rates tend to be similar to GDP growth rates. Thus an extension of the term of x percent should increase the present discounted value of a project by about x percent.

Incentives for Efficient Marketing

One limitation of LPVR franchises is that incentives to engage in marketing activities are reduced when the term is fixed, because any marketing effort that translates into higher demand shortens the term of the franchise, so that profits increase less than they would under a fixed-term franchise. Franchise holders thus face fewer incentives to invest in demand-increasing features. For this reason LPVR auctions need to be complemented with institutions that determine and enforce minimum quality standards to be met by franchise holders (see Tirole 1997). Pure LPVR auctions are not thus recommended for infrastructure projects in which demand is highly responsive to the activities of the franchise owners and in which minimum standards are not sufficient to ensure adequate service.

Additional means can be used to enhance marketing efforts. Lump-sum payments that are inversely proportional to the length of the effective franchise term may provide additional incentives for efficient management (Tirole 1997). In some cases unbundling may be used to separate those parts of the business in which performance incentives are not needed from those parts in which they are important (see Engel, Fischer, and Galetovic 1997b).[24]

Conclusion

Franchises have not been widely used to privatize infrastructure, and experience with private infrastructure franchises has not always been positive. In some cases, franchises that purport to create infrastructure without the need for government financing have lead to nontransparent transfers of funds through renegotiation of the original contracts. Such has been the case in Mexico, where the government has spent vast sums on guarantees for and renegotiation of the contract for new roads.

Fixed-term contracts, which are commonly used to franchise private infrastructure projects, are at the root of the demand for guarantees. Such guarantees are an inappropriate mechanism for reducing the risks faced by franchise holders.

The LPVR mechanism is a competitive mechanism for auctioning infrastructure franchises that represents a significant improvement over other mechanisms in many instances. LPVR auctions reduce the need for government guarantees and thus promise to decrease the likelihood of future massive infusions of public funds into "private" infrastructure projects.

LPVR auctions eliminate much of the undesirable demand risk borne by the franchise holder, but they provide insufficient incentives to provide services of good quality and to invest in socially valuable marketing efforts. To mitigate this problem, LPVR franchises should be complemented with other regulatory innovations, such as independent third parties that verify quality of service standards and the introduction of appropriate fines for noncompliance (Tirole 1997).

Notes

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1. A large number of cases in which road franchises were renegotiated are described in Gómez-Ibáñez and Meyer (1993).

2. For a list of previously regulated infrastructure services that are now provided in competitive markets, see Klein and Smith (1994).

3. French municipal water franchises are an exception, since they are auctioned periodically in order to stimulate efficiency. They rarely change hands, however (see Klein and Smith 1994).

4. Behavior is opportunistic if it takes advantage of ambiguities in a contract (see Williamson 1985).

5. Banks could avoid the problem of nonperforming loans by forming syndicates, but these are subject to severe agency problems.

6. All kinds of risks (demand risk, policy-induced risk) are considered equally as the franchise holder—and hence its bankers—must bear them.

7. Value at risk refers to the largest loss whose probability is 0.05 or more. This criterion is one of many possible ways of capturing the fact that guarantees are exercised in bad times, not in normal times.

8. Value at risk (see previous note) is more appropriate than the expected cost of the guarantee because guarantees present a problem under adverse economic conditions for the country as a whole, when guarantees on several projects are called simultaneously.

9. Where marginal costs are constant or decreasing, as they are in various kinds of infrastructure projects, this is equivalent to maximizing consumer surplus subject to the constraint that the franchise holder earns normal profits.

10. "Risk" refers to the fact that returns are a random variable, not that returns may be negative with positive probability. An increase in risk indicates a mean-preserving spread of the distribution of returns.

11. Firms are assumed to be risk-averse in the sense of decision theory under uncertainty.

12. If the risk is partially correlated with the taxpayer's wealth, the result applies to the component of risk that is uncorrelated with it.

13. There could still be cost sharing for adverse selection reasons, although in the case of auctions the argument for cost sharing is weaker (see chapter 7 in Laffont and Tirole 1993).

14. The idea is due to Chadwick (1859); see also Posner (1972). Chadwick was inspired by the French experience with competitive public works contracts dating back at least to fortress construction under Vaubon in the seventeenth century. For more on infrastructure privatization in an historical perspective see Klein and Roger (1995). For a critical assessment of Demsetz's work see Williamson (1985).

15. These problems do not arise when there are close substitutes for the services of the project, since the franchise-holder will be interested in expanding capacity in order to avoid losing customers.

16. Some mechanisms, such as those used for private highways in Mexico, give the franchise holder the option of extending the franchise for an additional fixed term at the end of the original franchise. The analysis in this section applies to these cases as well. The most common fixed-term mechanism is one in which the regulator fixes the term and the franchise is awarded to the firm that offers to charge the lowest user fee. In a variation used in some highway fran-

chises in Mexico, the toll (user fee) is set by the regulator, and the franchise is awarded to the firm asking for the shortest term.

17. Of course, the regulator may impose taxes or subsidies to compensate for externalities, but these have to be fixed after the winning bid is selected and may thus be open to regulator discretion.

18. This figure underestimates the true advantages of the LPVR auctions, because it does not include gains stemming from the better renegotiation characteristics and the added flexibility in capacity and toll setting.

19. A formal argument follows from the Arrow–Lind result.

20. Being more optimistic leads to a somewhat more aggressive bid because estimated operating costs are lower. When operation costs are small relative to the investment cost this effect is substantially smaller than the effect of uncertain demand in the case of fixed-term auctions.

21. In practice the amount should be reduced to account for the savings in operating and maintenance costs due to early termination of the franchise.

22. Note, however, that tolls should not be set so low that the franchise never achieves the revenue demanded in the winning bid.

23. Since there may be collusion among auction participants, the government should set an upper bound on the guarantee.

24. Marketing can also be enhanced by lowering the discount rate, which makes shorter franchises more attractive. Lowering the discount rate may create other distortions, however.

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Comments on "Infrastructure Franchising and Government Guarantees"

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The analysis and policy recommendations in this chapter are valuable to the discussion on the conditions under which governments should provide guarantees for private investment in infrastructure. Engel, Fischer, and Galetovic correctly conclude that both explicit and implicit government guarantees can lead to the selection of "white elephants," lowered efficiency, and distortion of the competitive bidding process. At the same time these contingent public liabilities can lead to a fiscal crisis, especially if the event that triggers the guarantee can be manipulated. The chapter also correctly concludes that lump-sum subsidies are economically more efficient than guarantees as a means of attracting private investment. Thus the justification for guarantees needs to be made in terms of their effect on risk.

The chapter distinguishes between exogenous risk and project-specific risk and states that the risks should be allocated to those most able to bear and control them. The emphasis on the traditional insurance motivation for government guarantees (on the grounds that the government is risk neutral while the private sector is risk averse) appears excessive because the superiority of the public sector to bear exogenous risk is doubtful. Private investors are typically large foreign corporations with access to international capital markets, whose shareholders are in a good position to bear risk and diversify it. In contrast, governments are often limited in their ability to diversify risk, and taxpayers, who have to ultimately bear the risk, are not risk neutral.

The authors understate the potential of guarantees to reduce opportunism on the part of governments. A key justification for the participation of bilateral or multilateral institutions in infrastructure finance is that these institutions' special relationships with government can reduce government opportunism. To the extent that guarantees given in support of desirable commitments succeed in eliminating opportunism they are cost free. This ability of governments to change the rules of the game arbitrarily may also explain the failure of the private market to provide insurance or financing in the absence of official foreign participation.

The chapter proposes a new contract design, the least present value of revenue (LPVR) approach, to solve some of the problems in franchising. Although the approach is presented as an alternative to government guarantees, it is in fact another form of a government guarantee and therefore suffers from some of the same shortcomings with respect to its effect on economic efficiency and contingent fiscal liabilities. In fact, the franchise would be extended in bad states and result in lost public revenue, either directly, in the form of lost public tolls after the franchise returns to the public domain, or indirectly, in terms of lost bidding value for the new franchise whose starting date is postponed.

Although the LPVR also generates a contingent fiscal asset in good states of nature, how much of an

offset this represents and how it should be accounted for depends on its size and correlation with other fiscal assets. If the project is large and its outcome depends on economic activity, which is positively correlated with fiscal revenues, it merits some provisioning in the fiscal accounts, even if the expected loss is zero. Furthermore, the expected fiscal loss in bad states is likely to be larger than under traditional minimum guarantees, as private investors will want compensation for sharing the potential upside gains with the government.

The authors' confidence in the availability of long-term capital to finance lower-than-expected toll flows for a long time may be misplaced. Where imperfect financial markets make banks unwilling to finance projects with minimum revenue guarantees because the commitment to pay in the future may not be credible, the LPVR approach will not be effective either. If, in contrast, financial markets are assumed to work well, the minimum revenue guarantee scheme will also work. In this case by structuring minimum revenue guarantees so that any payments are made at the end of the franchise period, possibly out of payment from the new franchisee, the potential for a fiscal crisis can be reduced, thus removing one of the main objections to traditional guarantees.

The authors' distinction between minimum revenue guarantees and LPVR appears misplaced. The LPVR is a form of guarantee. The benefits of the approach derive from the revenue guarantee it provides, not from the term flexibility. To see this, consider a fixed-term franchise under a least present value of compensation method, in which toll revenues would be supplemented by a transfer (either positive or negative) to arrive at a given overall compensation by the end of the franchise. Except for the white elephant criterion, this method would perform at least as well as the LPVR method using the authors' own criteria.

One of the conclusions motivated by the paper is that the highest payoff comes from finding ways to reduce risks, especially controllable ones, such as policy and political risks, which can be mitigated through an adequate legal and regulatory framework as well as by developing a reputation for principled behavior. As a transitory substitute, guarantees should be concentrated on project-specific, controllable political and policy risks rather than exogenous risks. This implies that national government guarantees should apply to agencies and subnational governments that are under the control of the national government. Extension of explicit guarantees in contracts is only part of the problem. The renegotiation of contracts may present additional problems. In this case the LPVR method, and government guarantees in general, may be second-best instruments for reducing the risk of renegotiation.

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A desirable system of franchising should satisfy certain conditions. It should provide incentives to screen and maintain projects, be simply designed, include independent auditing and verification of service quality, include mechanisms to discourage "lowballing" contract bids while still being sufficiently flexible to allow desirable contract negotiations to take place, and it should not generate monopoly rents. Fixed term franchises, while providing powerful incentives for efficiency savings and market expansion, suffer from vulnerability to demand risks over which franchises have little control. The uncertainty over project value encourages "lowballing" to secure projects whose terms will subsequently be renegotiated while not providing information to renegotiate contracts when renegotiation is desirable.

In contrast, the LPVR auction reduces demand risk, which in turn encourages banks, which are concerned about default risk, to provide finance; makes it harder for government to expropriate returns; and discourages "lowballing." However, it reduces incentives to pursue efficiency savings or to increase demand for services. Such a system is therefore useful only when demand cannot be expanded by the franchisee. It should be combined with independent auditing of services provided.

The authors argue that incentives for opportunistic bargaining under LPVR are reduced. In fact, such incentives will still exist if the discount rate used in determining the present value of bids differs from the

underlying cost of capital. In addition, LPVR does not simplify the process of negotiating contracts whose benefits are spread over several franchise periods. Nor does it resolve the problem of reduced incentives to invest in the project toward the end of the franchise period, when the costs are borne by the franchisee but the benefits accrue beyond the date of termination of the franchise. This complicates the process of selecting between competing bids in an LPVR auction. To compare a low-price/low-investment and high-price/high-investment bid, some way of determining the terminal value of assets is required. These terminal values then need to be set against the present value of user charges.

The chapter discusses an important set of policy proposals in an informative way. However, in order to determine the desirability of LPVR auctions, some other issues need to be more fully considered. What is the appropriate level of risk sharing among providers, users, and the government, and what are alternative ways of achieving this? What, for example, are the relative merits of revenue caps, profit sharing, the use of exogenous cost indicators, and break clauses, which provide for renegotiation at particular points in time? To what extent do these different methods overcome or exacerbate the underinvestment problem of franchises?

5

Managing Exchange Rate- and Interest Rate-Related Project Exposure: Are Guarantees Worth the Risk?

Ignacio Mas

Abstract

Governments intermediate a substantial amount of interest rate- and exchange rate-related risk indirectly through their taxation systems, equity stakes in enterprises, borrowing instruments, commercial contractual agreements, and regulatory policies. These instruments fail to target or unbundle risks and thus do not allow different types of risk to be borne by the parties best able to manage them.

Explicit exchange rate or interest rate guarantees allow governments to better target the risks they absorb. But such guarantees are justified only if private insurance markets fail to function properly and government possesses superior information (on the broad nature of the risks, the likelihood of risky events occurring, the impact of the risks at the project level, and its own future policy stance) and is able to manage risks at lower costs (in terms of transaction costs or lower disincentive effects arising from shifting risks).

Having the government take on risk that relates directly to its own (and its successors') future behavior may signal government commitment to its stated policies. Guarantees can work as commitment devices, however, only if they are accompanied by longer-term policy reforms that reduce the likelihood of government having to pay claims against its guarantees. If over time the reforms do not materialize, guarantees are unlikely to continue to generate any signaling or commitment benefits. Moreover, in the short run the wrong signal may be sent if a liberalization program is supplemented with a government guarantee program, since the objective of liberalization is to reduce government's responsibility for project outcomes. For these reasons, the temporary nature of guarantees needs to be stated and made credible from the beginning.

Rather than providing guarantees, policy reform should be geared toward making private agents responsible for correctly assessing risks and handling them in the most appropriate manner. Reforms that would achieve this objective include eliminating the information bottlenecks that give government a superior understanding of the functioning of the economy and the occurrence of exogenous shocks, adopting market-friendly policy commitment devices so that private markets can better assess the future behavior of government under a range of circumstances, and enhancing the private sector's ability to pool and intermediate macroeconomic risks.

▼ ▼ ▼

Governments affect the size and nature of exchange rate and interest rate risks through their macroeconomic policies. Through their fiscal, financial, and regulatory interventions they also affect the allocation of these risks. By issuing short-term debt rather than longer-term debt, for example, the government increases its sensitivity to interest rate movements—thereby absorbing some of the interest rate risk. By granting tariff increases to a franchise holder following a devaluation, the government shifts exchange rate risk from the supplier to consumers.

Given the already pervasive government role in sharing, spreading, and transforming exchange rate- and interest rate-related risks, why should the government not take the extra step of explicitly guaranteeing such risks? In considering whether to adopt an exchange rate guarantee program, policymakers must address the following issues:

- Are explicit exchange rate guarantees consistent with liberalization?
- At the project level, can interest and exchange rate guarantees "insulate" projects from macro events so that renegotiation of regulatory, financial, or commercial contracts is not necessary in the event of a macroeconomic crisis? Is there such a notion as a "purely commercial risk" which would emerge even if there were perfect macro hedging instruments?
- How compatible are guarantees with macroeconomic performance targets for fiscal stability, country creditworthiness, and crowding out of private investment? Are they macroeconomically stabilizing or destabilizing?
- Are there other policy options to guarantees? How else could government commit to a particular macroeconomic policy and redirect macroeconomic performance risks away from government?

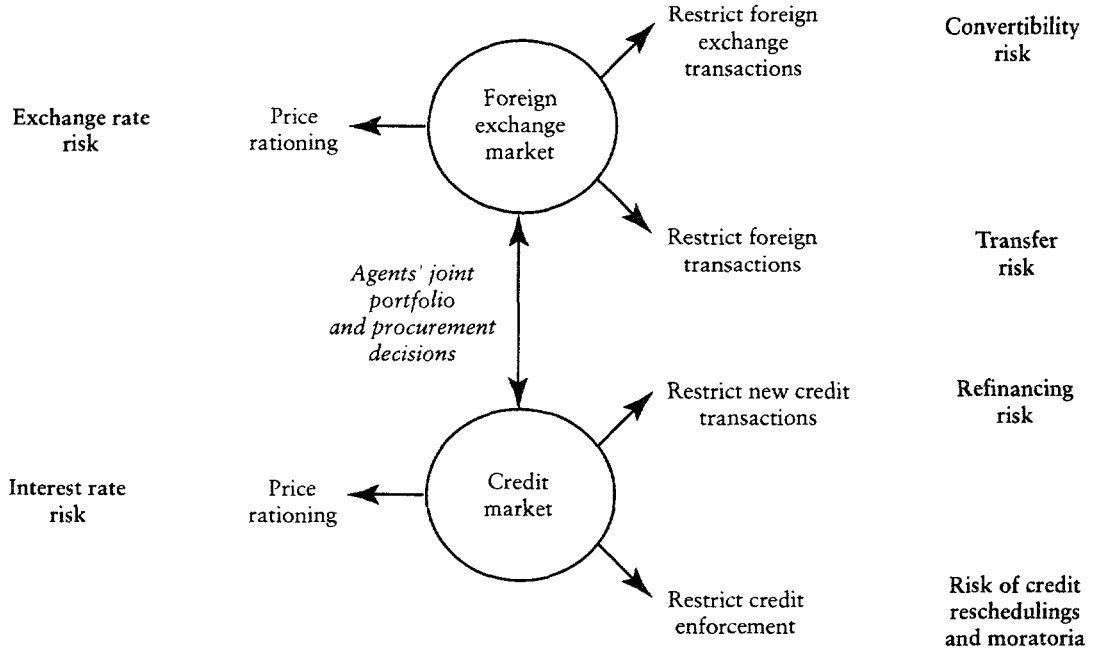
This chapter provides a broad framework within which to analyze interest rate and exchange rate guarantees. The first section examines the ways in which governments guarantee risks. Section 2 defines the various types of exchange rate- and interest rate-related risks, referred to here as macro risks, and shows that these risks are largely different manifestations of the same underlying risk. Section 3 discusses the potential market failures that may justify sharing of interest rate- and exchange rate-related risks by the government. Section 4 discusses the pitfalls of macro guarantees in correcting those market failures in terms of the incentive and signaling problems they generate. Section 5 discusses some alternative policy options for mitigating macro risks or reducing the government's role in reallocating those risks. Section 6 examines whether macro guarantees are consistent with liberalization, and section 7 identifies when such guarantees are appropriate. The last section summarizes the main conclusions and offers several criteria for policy decisionmaking.

Whether guarantees can be structured in a way that clearly separates commercial from policy risks remains dubious. If they are designed as a blunt instrument for risk sharing, guarantees run the risk of perpetuating the perception of government as the residual absorber of risk. Rather than guarantee risks associated with private provision of infrastructure, government should ensure a stable regulatory framework for infrastructure that strives for efficiency, deflects losses away from government, and ensures an adequate pipeline of nonnegative net present value projects (by providing appropriately structured and targeted financial support to socially worthwhile projects where necessary). Government can avoid responsibility for private failures most effectively by reducing regulation in the underlying markets and making those markets more competitive. It can facilitate the viability of private infrastructure projects and prevent bank crises, which might lead indirectly to government bail-outs of private infrastructure enterprises, by maintaining macroeconomic and financial stability.

Types of Exchange Rate- and Interest Rate-Related Risks

Interest rate- and exchange rate-related risks can be classified (figure 5.1). Under certain circumstances these risks largely represent different manifestations of the same underlying macroeconomic risks: the risk of a change in the balance between savings and investment. Only when governments segment markets hinder the price-clearing mechanism or prevent private

FIGURE 5.1
The relationships between the different types of interest rate- and exchange rate-related risks



agents from meeting their contractual commitments domestically or internationally do differences between these kinds of risks arise.

The root causes of exchange rate- and interest rate-related risk are similar. Suppose, for example, that a country is hit with an adverse terms of trade shock. Policy responses might include the following:

- Devalue, in order to regain competitiveness (exchange rate risk).
- Limit the scope of the foreign exchange market or crack down on the black market for foreign exchange to prevent the now scarce foreign exchange from going to less desirable uses or being hoarded (convertibility risk).
- Limit what foreign exchange can buy through a licensing scheme for importation of goods, and restrict repatriation of profits and repayment of foreign loans (transfer risk).
- Raise local interest rates to stem capital flight and induce capital inflows (interest rate risk).
- Raise banking reserve requirements and lean on banks to reduce their credit portfolios to cool off aggregate demand and thereby ease pressure on the trade balance (refinancing risk).

These policies are all common responses to the same underlying shock, and several will often be implemented jointly.

Exchange Rate Risk

Exchange rate risk reflects the sensitivity of a firm's value to unexpected movements in the exchange rate. The primary source of foreign exchange exposure is international transactions. Once a firm has contracted to purchase or sell a certain amount of a good at a specific foreign exchange rate, any variation in the exchange rate causes a gain or loss in local currency terms. Such transactional exposure is circumscribed in time, to the period between the contracting of the trade (or, more specifically, the fixing of the terms of the trade) and the settlement of the payment; it is limited in scope to the direct price effect associated with the local currency value of a fixed foreign currency amount.

Exchange rate risk might also arise from economic exposures that do not involve international payments. This exposure captures the change in the value of a project stemming from unexpected changes in the exchange rate and includes the following effects:

- *Indirect price effects.* A firm that sells all its output domestically and uses domestic inputs is nevertheless exposed to foreign exchange risk to the extent that the price of its input is more sensitive to exchange rate changes through trade opportunities than the price of its output (which is often not traded and is difficult to store).
- *Resource shift effects.* A firm that has chosen a particular level of capital intensiveness, which embodies a mix of tradable and nontradable inputs, may see its efficiency relative to its (national and international) competitors shift as the real exchange rate changes. This effect is caused by changes in the relative prices of inputs rather than by changes in the relative prices of inputs versus outputs.
- *Income effects.* Even if the input and output products of a firm were all non-tradable and hence not subject to indirect price effects of the type described above, a firm might still be exposed to foreign exchange risk to the extent that demand for the output is depressed following a depreciation of the currency. Some infrastructure services (such as long-distance calls) are highly income elastic and hence particularly prone to such income effects.
- *Asset quality effects.* A small local bank lending to local infrastructure firms in local currency may find itself in deep trouble in the event of a large devaluation if its borrowers are themselves exposed to foreign exchange risk. In this case, the quality of the bank's assets, rather than their nominal value, will be correlated with the exchange rate.
- *Induced policy effects.* Government policy responses to exchange rate developments may affect individual firms. The government might, for example, seek to counter deterioration in its fiscal balance by raising taxes, or it might tighten monetary policy, thereby increasing the cost of indebtedness.

Exchange rate risks are thus multifaceted, pervasive, and complex, and firms often face enormous risk because of their inability to define their foreign exchange exposures accurately.

Convertibility Risk

Convertibility risk refers to the possibility that a firm might be prevented from exchanging local for foreign currency. Lack of convertibility arises only in a policy environment in which the state restricts access to the foreign exchange market or allocates foreign exchange on an administrative, nonprice basis. In a free market there will always be a price at which the foreign exchange market will clear.

Government intervention in the foreign exchange market does not increase convertibility risk as long as the government stands ready to buy or sell foreign exchange at its quoted price freely on demand in unlimited amounts, or the government is willing to let the exchange rate move freely whenever market pressures exceed its own capacity to buy and sell. In either of these cases, demand for foreign exchange will match supply (including the government's), and quantitative rationing will not take place. The government may affect market outcomes through its market transactions, but it will not impede the price-clearing process.

The risks of foreign exchange inconvertibility and exchange rate changes are similar, as both derive from similar market pressures. The difference depends on whether the government accommodates or suppresses these market pressures. While these risks may reflect different policy responses to the same external macroeconomic imbalance, they may generate different dynamics for several reasons. First, the nature of the policy response will affect the risk itself (by influencing the credibility of government policies, for example). Second, realization of these risks may have very different effects on individual firms, since quantitative rationing precludes certain options whereas price rationing merely makes them more expensive. Inconvertibility may be restricted to a few transactions or agents, while devaluation cuts across the board. Third, since it creates more distinct categories of winners and losers, a policy of inconvertibility is likely to generate greater pressures for corruption and rent-seeking behavior than a policy of more flexible exchange rate adjustment.

If foreign exchange shocks are absorbed by flexible prices rather than through quantity rationing, corporate planners and market analysts need only assess where the price of foreign exchange will go. If instead the government relies on quantity rationing, analysts need to assess the extent of such rationing and try to determine who will be affected. Doing so may be difficult, since it is likely to depend on political factors.

The risks of foreign exchange inconvertibility and exchange rate movement are closely intertwined under a regime of multiple exchange rates, under which a firm may be "rationed out" of a particular foreign exchange category and forced to convert at a less favorable exchange rate. Unlike exchange rate risk, convertibility risk refers strictly to transactional exposures. For example, a firm may face inconvertibility on capital account transactions or profit repatriation but not on commercial transactions.

Insurance against inconvertibility of foreign exchange is the most popular type of risk insurance offered by international insurance companies and government agencies in industrial countries. This form of insurance is preferred over direct exchange rate guarantees for several reasons. First, multinational companies are prepared to pay a premium to secure foreign exchange but are not prepared to have their investment returns frozen abroad. In other words, they may be flexible about the financial terms of repatriation, but they may revolt against the prospect of being barred from converting revenues. They are used to the notion of taxes, even onerous ones, but not to confiscation. Second, when a multinational purchases convertibility insurance from a host government agency or insurance company, it seeks not financial compensation but political support that, in the event of inconvertibility of the foreign currency, it will be "rationed in." Purchasing convertibility insurance may represent an attempt to manipulate the inherently discretionary allocation mechanisms that characterize nonprice rationing schemes.

Transfer Risk

Firms may want to convert between local and foreign currency to make international payments or to diversify their portfolios between assets denominated in local and foreign currency. Transfer risk affects only the ability to take foreign exchange out of the country. Conceptually, it is different from convertibility risk, but the two types of risk are highly correlated, since the factors that would induce governments to suppress the local market for foreign exchange would also prompt them to restrict foreign payments. In practice, private guarantees of convertibility and transfer are offered jointly (although there is some correlation between the two, as evidenced by the cyclical nature of risk premia).

Interest Rate Risk

Interest rate risk refers to uncertainty over the macroeconomic determinants of benchmark interest rates. Interest rate risk can be decomposed into inflation risk and real interest rate risk. Credit risk refers to changes in the credit spread; it is not treated here, as it does not have a direct macroeconomic origin.

Interest rate risk may reflect transactional exposure (the impact of changes in prevailing interest rates on the burden of repaying a loan or on the returns from holding a bond) or economic or operational exposure (the impact of changes in interest rates on the demand for a firm's product through relative price effects, income effects, or asset quality effects).

Interest rate risk and exchange rate risk are closely linked, because they jointly determine the relative returns on domestic and foreign currency denominated instruments. Assuming capital mobility between any two countries, a local currency-based investor can invest locally (that is, bear local interest rate risk) or invest abroad (that is, bear foreign interest rate risk plus exchange rate risk to bring the returns back into local currency). The expected return on these two investment options should be the same, plus or minus a risk premium. For investors who invest abroad, foreign exchange risk includes both uncertainty about the level of the exchange rate and uncertainty about future inconvertibility and transfer risks. This arbitrage condition will not function if there are current restrictions on investment abroad (including restrictions on conversion and transfer of currency), but it does not preclude the imposition of such restrictions at a later date.

To see how interest rate parity works, suppose that dollars and pesos trade at par (that is, at an exchange rate of 1) but that the interest rate on pesos is 10 percent a year and the interest rate on dollars is 5 percent a year. In this case, $1 invested in dollar securities will produce $1.05 at the end of the year, while the same $1 invested abroad will generate 1.10 pesos at the end of the year. Investors will be indifferent between these two options only if they expect that, a year from now,

$1 will trade for 1.048 pesos (=1.10/1.05). If the market expects the devaluation of the peso to exceed 4.8 percent, there will be a rush into dollar securities, which will either cause an immediate depreciation of the peso (so as to reduce the future expected depreciation); drive up the price of dollar securities and reduce the price of foreign securities, thereby causing dollar interest rates to fall relative to foreign interest rates; or both.

Interest rate risk and exchange rate risk become equivalent if the interest rate parity holds: Investors would be indifferent between borrowing in local or foreign currency, since any devaluation would be reflected in rising local interest rates so that in foreign currency terms investing locally became as attractive as investing abroad.

Interest rate parity was evident in the aftermath of the Mexican crisis in late 1994: the risk of further devaluation made foreign currency investments very attractive, which forced local interest rates upward. In fact, it was the central bank's attempt to suppress rises in local rates through monetary expansion when the peso was under pressure (as evidenced by a decline in international reserves at the central bank) that precipitated the crisis. The harsh reality of international interest arbitrage could not have been evaded unless the government had been prepared to suspend convertibility, thereby breaking the link between interest rates and exchange rates.

The link between interest rates and exchange rates depends on the extent to which equivalent local and foreign assets are substitutes in investors' portfolios. If investors do not prefer one currency over another, interest parity will hold. If investments in different currencies are only imperfect substitutes, the common currency returns on local and foreign assets will differ by a risk premium. The size of this risk premium will depend on how risk averse investors are and on how much of the risk associated with local and foreign investments can be diversified (which will depend on how closely returns on these investments are correlated with returns on the world portfolio).

The existence of a risk premium is well grounded in the theoretical literature. Empirically the implied risk premium is both large and very volatile, even among pairs of countries with free capital mobility, suggesting that the dynamics of interest rates and exchange rates is more complex than theory would suggest. (Annual interest rate differentials between, say, the United States and Japan in the 1980s and 1990s do not begin to approximate the observed movement in the exchange rate.) This issue is clouded statistically by the fact that empirical analyses of the risk premium are based on realized values of interest rates and exchange rates, whereas the arbitrage condition that is presumed to link interest rate and exchange rate depends on expected rates. Thus the large "observed" risk premium may simply reflect the fact that a plausible outcome was anticipated by the market but failed to materialize during the period studied.

Refinancing Risk

Refinancing risk refers to the risk that credit may not be available at a future date. Refinancing risk exists for both long- or short-term financing. Maturity risk refers to the risk that long-term instruments are unavailable. Extension risk refers to the risk that short-term instruments cannot be rolled over.

Refinancing risk needs to be distinguished from interest rate risk; which refers to the volatility of the levels of interest rates. Refinancing risk refers to the inability of being able to obtain financing at any price. Such rationing of credit can occur for several reasons. The state may retain credit under a system of administered interest rates or exchange rate controls. Banks may also retain credit, by not raising interest rates, even at the cost of turning away potential borrowers whose credit standing is indistinguishable from that of other current borrowers.

Market-based rationing may take place when borrowers have better information about the risks of their project than prospective lenders. In this case, entrepreneurs of riskier projects are likely to outbid others in the credit market (adverse selection), since they can generate higher returns and the lender will not discount these higher returns to reflect the higher risk. At the same time, by raising interest rates in this bidding process, lenders encourage borrowers to undertake riskier investments to pay for the higher-cost financing (moral hazard). Both sets of disincentives produce a ratcheting of risk-taking. To ration credit in order to

prevent a counterproductive escalation of real lending rates, lenders may ration credit by refusing to raise rates even if unsatisfied potential borrowers are willing to pay higher rates.

In essence, credit rationing arises because borrowers can misrepresent and manipulate their risk characteristics. When they do so, price (represented by the risk premium on the interest rate) fails to act as a credible market signal, and banks prefer to resort to nonprice rationing. At a macro level this process increases refinancing risk.

The interest rate counterpart of transfer risk for foreign exchange is the risk of mandatory reschedulings and moratoria, which refers to the risk that contractual commitments will cease to be enforceable. This risk was pervasive in Latin America throughout the 1980s, when reschedulings and credit moratoria occurred in Argentina, Bolivia, Nicaragua, and elsewhere.

Mechanisms through Which Government Shares Risk

Government guarantees of exchange rate- and interest rate-related risks vary greatly in terms of the nature, size, and specificity of risk coverage; the mechanism for compensation against claims; and the degree of legal recourse to government. Some guarantees are fully funded, project-specific contractual claims on the government. In other cases, government guarantees are not announced but are fully expected to kick in in the event of failure; they are instituted or formalized only in an ad hoc fashion after the fact (through tariff increases or a special funding facility, for example). Sometimes guarantees are implicit in the operation of the regulatory regime, with "claims" being met through favorable regulatory treatment rather than financial settlement. Other guarantees are even more subtle and indirect, operating through other policies, such as deposit insurance, the social safety net, or rural development.

Risk Sharing through the Tax System

The state shares in all private risks through the tax system. "By imposing an income tax on the investor, the Treasury appoints itself as his partner," according to Domar and Musgrave (quoted in Mayshar 1977). The income tax system is based on actual profit magnitudes, and hence the amount of tax paid by a firm depends on the realization of risky outcomes. Variations in corporate income may be induced by exchange or interest rate developments or by other commercial factors. To the extent that "good" outcomes are associated with more tax and "bad" outcomes with less tax and the success of various projects are not perfectly correlated, the tax system achieves some risk sharing.

The amount of risk sharing achieved through the tax system is less significant if project returns are correlated, because aggregate shortfalls in government tax revenues will introduce offsetting second-order effects. The government might raise tax rates or introduce new taxes to compensate for the loss of public revenue, for example, or it might put pressure on the interest rates and exchange rates through its deficit financing mechanism (additional borrowings or monetization), which might in turn aggravate the underlying cause of risk.

In either case, the government would be "clawing back," or recovering, the adverse effect of its risk sharing among the same set of agents with whom it was sharing risk. Although it might effect some redistribution in the process, the overall level of risk mitigation achieved would be small.

Government Equity Ownership

A second traditional mechanism for risk sharing by the state is through its assumption of equity participations in projects or ventures.[1] The public rationale for many nationalizations relates to exchange rate and interest rate risk in several ways. First, primary commodities are most exposed to exchange rate risk because of their undifferentiated, tradable nature. Primary commodity producers or traders have at times realized large windfalls stemming largely from exchange rate policy. Many nationalizations have been justified on the grounds that the government should participate in that upside risk. Second, infrastructure services are nontradable and relatively unexposed to exchange rate risk. However, they are very sensitive to

interest rate and financing risk because of their capital intensive, long-lived asset base. Third, new technologies and research and development-intensive industries have a hard time coming up with the requisite capital because of the apparent failure of capital markets accurately to value such projects and provide the necessary long-term financing. Governments have often played the role of venture capitalist, under the motto of "picking tomorrow's winners."

Selectively purchasing equity stakes in projects or ventures is an easier way for government to target the risks it will absorb than taxation. Targeting risks through the tax system would require a sophisticated tax code with differential effective tax rates on a sectoral or even firm basis. In contrast, purchasing an equity stake allows the government to acquire a slice of all project risks, without targeting risks at the project level.

Borrowing or Procurement Contract Agreements

Interest rate or exchange rate guarantees are sometimes implicit in the terms of longer-dated commercial or financial contracts entered into by the government. To the extent that it indexes its payments under borrowings or fixed-price commercial contracts in which the state is either supplier or customer, the government absorbs the risk of price movements.

This does not necessarily mean that the government reduces risk at the national level any time it indexes the interest rate of its borrowings (or, equivalently, shortens the maturity), since the government may "pass through" the higher interest cost to taxpayers if interest rates rise. But such a mechanism does represent insurance against interest rate movements for the bondholder, since the bond maintains its value as interest rates change.

Government Guarantee Programs

Governments sometimes offer explicit exchange rate and borrowing guarantees to eligible counterparties. Only cases in which the government is directly liable for any future settlement amounts out of its own fiscal or quasifiscal sources are examined here. Excluded from the discussion are government promises to hold a particular path of the exchange or interest rate, since they apply for an indeterminate length of time and government is not financially bound to compensate all parties if it changes its exchange rate or monetary policy.

Exchange Rate Guarantees

Explicit exchange rate guarantees are generally the preserve of the central bank, partly because exchange rate policy is typically its domain and partly because it is the only player with sufficiently deep pockets to absorb the potential claims that may arise from such guarantees. The dual role of the central bank in setting policy and managing the guarantee program creates conflicts of interest at two levels, with potentially devastating consequences. First, the central bank will be tempted to use the terms of the guarantees to signal its policy objectives and induce changes in expectations. As a result it may offer cheap guarantees to signal the sustainability of a misguided exchange rate policy. Second, once the central bank has provided a sizeable volume of exchange rate guarantees, it may be reluctant to adjust the exchange rate in the face of sustained market pressures because of the financial losses it will incur if the guarantees are triggered.

Exchange rate guarantee programs were prevalent throughout Latin America in the 1970s and early 1980s. In general, they were used to support a fixed exchange rate system, which meant that the central bank could not "price in" a probability of devaluation. The guarantees were instituted to support a particular (typically overvalued) exchange rate. Once in place they made it even more difficult for the central bank to abandon that rate, turning balance of payments crises into severe fiscal crises.

Borrowing guarantees. Many governments have also supported projects through explicit borrowing guarantee programs. Three types of borrowing guarantees have been used:

- In a pure credit guarantee the debt of the project becomes as good as the government's own debt since the government stands ready to pay it back in the event of the borrower's default. From the point of view of the project, a credit guarantee is analogous in its effects to an exchange of public

for private debt (Bosworth, Carron, and Phyne 1987). If the government merely guarantees a commercial credit, its effect is to reduce the project (private) credit risk spread to zero. But that does not in any way reduce the project's exposure to pure interest rate risk—the volatility of the benchmark interest rates—since a benchmark rate is exactly what the project will be offered in the credit markets. The fee for the guarantee translates into a fixed credit spread.

- In different scheme, often applied through national development banks, access to a certain amount of funding at a particular rate is guaranteed. The government goes beyond guaranteeing payment on loans secured commercially by the project and becomes the lender itself. Because the overall interest rate is set, the scheme is equivalent to a joint interest rate and credit guarantee scheme.
- In pure interest rate guarantee, the borrower is shielded from overall movements in interest rates, but individual credit spread is not affected. This could be achieved by guaranteeing a borrower access to an interest rate swap on the back of a borrowing, but without guaranteeing the underlying borrowing itself. In this fashion the borrower would be fully assessed by credit markets on the basis of its credit risk, but it could shield itself from movements in the overall level of interest rates through the swap which would allow it to transform the cashflow structure of the borrowing by changing the interest rate resetting period or even the currency. The interest rate swap could thus be used by the borrower to hedge the benchmark interest rate but not the credit spread. Governments have not typically guaranteed hedging vehicles such as swaps, even though the rhetoric of interest rate guarantees would seem to suggest that the policy objective being pursued is in fact to shield firms from movements in the overall level of interest rates.

Regulatory and Contractual Agreements

Price control mechanisms for regulated private monopolies often contain a guarantee, which is needed to provide confidence to infrastructure providers to invest in and operate the facilities and to customers to support the privatization process. One form of guarantee is a price cap, which explicitly introduces a link between a price index and the tariffs or revenues of the operator. In some cases tariffs are explicitly linked to the exchange rate. Where they are linked to inflation, it could be argued that to the extent that purchasing power parity holds over longer time periods exchange rate protection they provide some exchange rate protection. The consumer price index basket may also include borrowing costs, in which case inflation and interest rate risk are directly related. Probably more significantly, inflation-indexed tariffs serve to offset the inflation risk component of interest rate risk on the funding side. Thus, price indexation mechanisms on tariffs are closely tied to an operator's ability to bear interest rate and exchange rate risk.

Regulated tariff schemes on infrastructure firms have a poor track record as macro guarantee devices for three reasons: they perform poorly in unstable macroeconomic environments, they are subject to contractual or de facto regulatory reviews that undermine their credibility, and they do not permit a separation of macro risks from commercial risks. Each of these problems is discussed below.

Experience has shown that price cap formulae do not work well when the underlying macroeconomic environment is volatile. In some cases, as in the price cap arrangement for CANTV, the Venezuelan telephone company, tariff adjustments tend to be backward looking, as each period's new price cap is based on realized inflation in a previous period. This introduces a great deal of real price volatility and leads to a shortening of the tariff revision periods and hence more frequent tariff adjustments. But the fact is that real tariffs increase most when inflation is subsiding (as tariffs merely catch up with past inflation). This creates social and political dissatisfaction as rates increase when the public is in the worst position to absorb the higher prices (after it has been hit with an inflationary shock) and when it is in the best position to observe relative price changes (once inflation is low again).

Another example of the problem with using price caps in an unstable macroeconomic environment is the concession for water supply in Aguascalientes, Mexico.

Under the terms of the concession, tariffs needed to be raised following the real interest rate shock that accompanied the 1994 devaluation, since they were indexed to a basket that included interest rates, which reflect the cost of capital. The required price increases were politically unacceptable, however, and the government ended up taking over investment responsibility, thereby undermining the divestment. Similar cases have occurred elsewhere in Latin America.

In some cases, as in price regulation in telecoms in Australia, the price cap is based on contemporaneous rather than lagged inflation, so that the operator has to "guess" what inflation will be in setting its tariffs. As the end of the year approaches, the operator has an opportunity to adjust its tariffs based on improved forecasts of year-on-year inflation. This could be difficult in an unstable inflationary environment in which inflation can surge by ten percentage points or more in a single month.

Regulatory discretion in changing the terms of tariff regulations need not be injurious to the operator. (The recent case of Aguas Argentinas may be a case in point. Prices there were raised a little over a year after the operator obtained the concession.) However, revisions of tariff formulae undermine the stated objectives of the price cap regime.

Experience has also shown that explicit tariff regulation formulae are prone to tampering by the government. A price cap scheme that is fair at the time it is designed and negotiated may turn out to generate substantial profits to the operator, perhaps because of the operator's efficiency. Such profits are very hard to sustain politically in the case of infrastructure firms that have a dominant market position and offer services deemed essential. Pressure to renegotiate may be insurmountable, especially when a new government takes office. This happened in the United Kingdom in late 1995, when the electricity regulator changed the terms of the price cap, even though no revision was due for several years. Governments can also penalize operators for earning large profits by increasing their taxes, as the Labour government in Britain is proposing to do by introducing a one-time windfall tax on utilities to "claw back" the unjustified largesse presumed to be granted to them by the regulator through overgenerous price caps.

Finally, it should be noted that "guaranteeing" tariffs merely transforms price risk into quantity risk. If macro factors affect the level of demand (independently of price), macro and commercial risks become inextricable. The operator may be guaranteed that its price will keep up with inflation, but if the amount it sells is sensitive to the level of inflation, it will not be insulated from the effect of macro policies.

This discussion has focused on macro guarantees that are embedded in explicit price cap formulae. Where there is no explicit formula indexing future tariffs, there may still be a de facto exchange rate guarantee if the regulator approves ad hoc changes in the regulated tariffs in response to exchange rate or inflationary shocks. Paradoxically, the implicit guarantee offered by discretionary tariff revisions may be stronger than the explicit guarantee in a price cap if it is deemed to be politically more sustainable. Because regulatory negotiations may be less confrontational and politically sensitive if they are part of an ongoing process, a discretionary system may offer operators more "protection" than a highly visible one-time setting of tariffs.

Where price cap formulae do achieve the desired degree of inflation or exchange rate risk insurance for regulated infrastructure operators, risk is shifted to consumers rather than to taxpayers at large. An advantage of shifting the macro risks faced by infrastructure providers to consumers (through indexation of tariffs) rather than to taxpayers (through guarantees) is that consumers can choose the level of service they want based on the total cost of provision. This provides a mechanism for market-testing new projects: the operator will want to expand capacity only if it is sure that demand justifies doing so. If price level risks are borne by taxpayers, some alternative administrative criterion is needed for making such decisions.

Arguments in Support of Government Intermediation of Risks

Infrastructure investments in developing countries involve substantial risks that may stem from an uncertain policy environment and inherent macroeconomic instability, the novelty of the technology, the relatively long gestation period before returns on investment are

reaped, uncertain prospects for local market growth, and the lack of established reputation and track record of aspiring promoters (Eichengreen 1994).

Private provision of infrastructure can be hindered if private investors are not able to assess these risks because of insufficient information or they are unable to transfer these risks efficiently. Where asymmetries in information exist between public and private agents and collective action by government can distribute risks more efficiently than individual voluntary action through private markets, risk sharing by the government may be justified.

Government's Informational Advantages

Capital markets may fail to channel sufficient resources to worthwhile projects, or they may fail to exercise sufficient control over the corporate use of those resources because they lack access to relevant information on the projects. Substantial exchange rate and interest rate risk may aggravate the information asymmetries between financiers and project promoters to the extent that they have different subjective assessments of the nature and extent of the exchange rate- and interest rate-related risks (that is, the probabilities of different exchange rate and interest rate outcomes) and the likely impact of different exchange rate and interest rate outcomes on project performance (that is, their own exposures).

To the extent that these differences in perception cloud assessment of project quality and managerial performance, they can affect incentives for effort and risk taking. In particular, they will hinder proper screening of the true nature of risks of proposed projects before they are financed, and they will hinder proper monitoring of managers' actions once they receive financing. This may deter some agents (financiers) with imperfect information from entering into transactions with other agents (entrepreneurs) who are presumed to be better informed for fear of being taken advantage of. As a result some projects will not be financed and some markets may be prevented from emerging at all. Eliminating uncertainty over macro performance—on which information is very limited and public perceptions can be diverse—may make financing more viable.

The traditional finance approach emphasizes the futility of hedging at the corporate level: corporate managers should not be concerned with the risk preferences of individual investors because investors can always take on or off-load risks through the capital markets. Risk management is a portfolio issue that should be left to investors.

In the presence of informational asymmetries, however, there may be advantages to having risks managed at the corporate rather than the investor level if managers are in a better position to assess and deal with project risks. In this case, corporate hedging of project risk may go beyond "second guessing" investors' overall portfolio exposure and taste for risk; it may add value by enhancing the ability of investors to evaluate the prospects and performance of projects. According to this view, investors benefit if some decisions are made at the corporate level by agents with superior information.

This argument may justify corporate hedging of project risks, but it does not necessarily justify government intervention to absorb these risks. Government intervention in the face of asymmetric information is justified only when the state has better information than private agents on the nature of these risks and is willing to share or use that information to correct or compensate for market failures and public assumption of risks is a more efficient way to take advantage of the state's informational advantage than the mere public disclosure or sale of such information.

In the case of exchange rate- and interest rate-related risks, the government's informational advantage stems from its superior knowledge of its own future policy intentions (the objective function). To the extent that it is better informed about the economic model or functional representation of how the economy works and reacts to exogenous shocks (the constraint set) or the occurrence of such shocks (the data inputs), the government can share that information with the public through prompt press releases. (Government can certainly "create" an informational advantage by withholding relevant information from the public, but then the policy prescription would be eliminating this information bottleneck rather than guaranteeing risks.)

The government's advantage in terms of knowledge of its own future policy intentions is intrinsic. Even if government adopted a very open attitude, this

superior information would be hard to convey credibly, since it cannot be verified independently. Moreover, the government is the victim of a basic time inconsistency problem: while it may try to encourage certain behavior on the part of private agents by promising a certain course of action, after the fact it may be optimal for the government to change course. As the following examples show, both government actions—the promises and the reneging on the promises—are optimal policies at the time.

- Government may want to promote investment in infrastructure by pledging low taxation and exemptions from import duties on the grounds that infrastructure is a national priority and infrastructure services are socially essentially. But once the investment has been secured, government will have a strong incentive to tax it. The high level of immobile fixed assets in infrastructure sectors makes these sectors particularly vulnerable to surprise taxes.
- Government may want to induce greater efficiencies in the operation of existing infrastructure facilities. To that end it might negotiate a price cap regime that allows the operator to reap the benefits from extra cost savings. However, once the operator demonstrates that it can indeed reap these benefits, government will be tempted to expropriate the corresponding profits through a windfall tax, as is being proposed in the United Kingdom.
- Government may promote discipline among banks and infrastructure providers by announcing that it will not impede failure, but once a failure does occur it may be optimal to bail out a firm.

Since the public is aware of this time inconsistency problem, it will not believe government's proclamations of policy intentions.

In principle, government guarantees could circumvent this problem by signaling policy objectives on exchange rates and interest rates through the terms of the guarantees that it is willing to enter into. It may be a sad reflection on contemporary political structures that financial guarantee contracts are generally considered to represent a more explicit commitment from government than policy announcements, electoral promises, or even enactment of laws.

The promise of government payout in the event of a macroeconomic crisis is a way of tying the government's hands thereby reducing the scope for mismanagement. Guarantees thus become a device with which to gain credibility. Where the government's track record is poor, however, guarantees are not likely to be worth more than old promises of proper economic management. (It should be noted that the relevant track record is that of government itself—or, more specifically, the political structure through which leaders emerge—rather than that of the specific incumbents in office or the reform process itself. Good macro policies that have only feeble prospects of being sustained through subsequent governments will not draw investment into long-term, capital-intensive infrastructure sectors.)

Guarantees can serve not only to reveal government's true objectives but also to shape them—by creating financial incentives for the government to meet those objectives. Thus guarantees can address information asymmetries on the government's macro policies by further committing the government to its policies.

Nevertheless, guarantees cannot solve the fundamental problem of credibility. Government has a notoriously hard time committing itself to a specified course of action, largely because it is the ultimate enforcer of rights, laws, and contracts. Even if it has a track record of enforcing commitments by others, it will find it difficult to commit to enforce actions against itself. This suggests that guarantees may work well to protect private agents against small macro risks (claims the government would be likely to honor if necessary). but cannot be expected to be of much help against larger economic threats or devious governments.

Government's Ability to Intermediate Risk

Government is a risk-intermediating institution: it takes from some and gives to others, with the amounts determined by economic outcomes (the distribution is state dependent). Government is a "pass-through," since all its liabilities are ultimately passed on to its tax bases. In this respect, government is a partnership of all taxpayers. There is no notion of limited liability of taxpayers.

The main difference between government and a private partnership like Lloyds is that government has coercive powers to force all to become liable for its actions. Voluntary partnerships require absolute clarity on the extent and hierarchy of liabilities among the partners. In contrast, since government is not a voluntary association it can manipulate the terms of the partnership by changing its asset and tax bases. Government's freedom to redistribute risks is limited only by the threat of political or military curbs on its power and by individuals' ability to reduce their exposure to government's tax bases by shifting or hiding assets (capital flight) or reducing their participation in formal economic activities.

Two sets of arguments support the view that government might be in a better position to distribute project risk in the economy than private markets. Both arguments relate to government's size. On the asset side, government participates and invests in a large number and variety of projects and hence is better able to *pool* risk. On the funding side, government is financed from a diversified, atomistic tax base and hence is better able to *spread* risk.

These arguments suggest that the degree of distribution of risks that can be achieved through the public sector—whether by pooling assets or spreading liabilities—cannot be achieved privately, so that risk diversification and reallocation through the public sector is superior. Interest rate- and exchange rate-related risks have a component of pervasive systemic risk, so that their reallocation to the parties in the best position to bear them becomes very important. Spreading out risk in small amounts over a myriad of taxpayers could, in principle, diversify all risk away, reducing the aggregate cost of risk bearing to zero.[2]

Government's capacity to bear interest rate- and exchange rate-related project risk is large because it has a (long) call option on a very large number of taxpayers. Taxpayers can be viewed as captive investors in a large mutual fund of projects. But private markets could organize a similar joint risk-bearing capacity that achieves the same degree of risk diversification and spreading. Whether the public risk-sharing mechanism is superior to that which could be achieved through private markets depends on how taxpayers value the government's call option upon them—that is, on what the implicit risk premium they would require to hold an equivalent stake in the same set of projects on a voluntary basis. Government intermediation of project risk is warranted only if it is more costly for taxpayers to assemble collectively the same profile of risks through the capital markets. The problem with using forced tax collections as investment insurance is precisely that there is no check on the extent of risk premium reduction actually achieved (Klein 1996).

Risk Allocation and Contractual Issues

Public guarantees of private projects involve a tradeoff between the need to correct presumed market failures and the need to preserve private incentives for performance, maintenance, and investment. Given this tradeoff, the risks absorbed by government through guarantee programs should be selectively targeted and monitorable, and they should blunt or alter private incentives only when those incentives conflict with social objectives.

In structuring guarantees—and indeed in deciding whether the guarantee instrument is the right form of government financial support—it is useful to think in terms of comparative advantage in risk bearing and to allocate risks to those in the best position to affect or manage them. Allocating risk appropriately ensures that incentives are in place to control risk effectively and that all information on the nature and level of risk is employed. This reinforces the conventional wisdom that country/policy risks should be borne by government, since government causes the risk, while purely domestic firms have pervasive exposure to country risk, and private project promoters should bear all commercial risks linked to the quality of internal project decisionmaking. Neither conventional wisdom nor accumulated experience suggests that governments should offer exchange rate guarantees indiscriminately, since such guarantees are not credible, they can be macroeconomically destabilizing, and governments often set the terms of the guarantee at the wrong level for the wrong reasons.

A parallel criterion is that risks should be borne by the party with the greatest ability to absorb them in terms of the relative concentration or diversification of

risks, the correlation with its own portfolio, the access to hedging markets, and the relative degrees of risk aversion. This criterion challenges the conventional wisdom that guarantees should be used to attract foreign investors. Since international investors are generally in a better position to diversify away the systemic risk of individual countries given their broad international presence, they may be in a better position to hedge a country's macroeconomic risk if it is correlated with, say, foreign interest rates, the price of a primary commodity, or prospects in a major trading partner country. In contrast, local residents may not be able to tap the appropriate international hedge markets.

Macro guarantees generally transfer macro risks from foreign investors to local taxpayers (including payers of inflation tax) for whom country risk is pervasive and inescapable. Their effect is thus to concentrate systemic risks on those least able to absorb them.

Applying these rules on risk allocation requires that risks be isolated, so that different types of risk can be borne by the parties best able to bear them. Separating or unbundling risks requires specificity and enforceability of guarantee contracts.

Contract Specificity

Where different risks are uncorrelated, realization of different types of risks can be observed separately and treated as separable events, even if they occur simultaneously. Each risk can be assigned to the party best able to manage that risk; actions by others may not have a bearing on the individual risk assumed by each party. With separable risks and specific contracts, it is possible to assess each party's responsibility for outcomes and avoid shirking of responsibilities.

Where different types of risk are correlated, only their joint realization can be observed and the outcome cannot be attributed to any one source of risk. If different types of risk are under the influence or control of different agents, it is difficult to assign responsibility for bad outcomes; in practice, all parties will be jointly held responsible. This introduces moral hazard problems if the agents have very different interests and taking action to control risk is individually costly.

Contract specificity requires that inflation- and exchange rate-related risks be unbundled from other risks, particularly from purely commercial risks. This may be difficult to achieve, however, since exchange rates and inflation are highly correlated with real sectoral demand and supply factors. Across-the-board price inflation has a direct price effect on, say, telephone tariffs but may also induce quantity effects through its income, substitution, and wealth effects. In the event of a large devaluation, it will be hard to extricate the impact of the devaluation from the general quality of the commercial strategies adopted. Inflation- and exchange rate-related risks must also be independent of the political/regulatory regime so that they are separable from the general risk of maintenance of the rules of the game, which is clearly a joint determinant of commercial outcomes.

Inflation- and exchange rate-related risk may be too pervasive in infrastructure provision to extricate from other commercial factors. The commercial failure of Mexico's private road operators in 1995, for example, is generally believed to have been caused by overly optimistic forecasts of toll revenues (*Financial Times,* 6 October 1995). The fact that operators misjudged how their customers would be affected by and would react to a large devaluation (which was to some extent "priced in" by the market through an exchange rate premium, indicating that it was not an entirely unexpected outcome) may reveal a fundamental misunderstanding of macroeconomic interactions rather than bad commercial sense, however.

Contract Enforceability

Contract enforceability requires that the insured event be not only specific but explicitly observable and monitorable and that a credible set of sanctions and/or adequate arbitration can be brought to bear by either party.

In a purely national context the government is restricted in its powers by the rule of law. However, there may be a significant correlation between the government's tolerance for the occurrence of the insured events (large devaluations and high inflation) and its lack of respect for maintaining the rules of the game. A government that causes hyperinflation in order to collect some inflation tax may also suspend its contractual obligations, including any guarantees outstanding. In fact, its policy may be to corner itself

into being unable to pay. The government's willingness and ability to pay claims is thus inversely proportional to the probability of occurrence of the insured event. Lack of enforcement is compounded by a fundamental lack of credibility precisely under those circumstances in which the guarantee is most needed.

A notorious case in point is the COGASCO gas pipeline in Argentina, a BOT project completed in 1981. COGASCO bought gas in pesos from the state-owned YPFB and sold it in pesos to Gas del Estado (another state-owned enterprise). The central bank had given a convertibility guarantee to the sponsors to repatriate profits, but the foreign exchange crisis that coincided with the end of the project meant that the central bank could not honor its guarantee. At the same time, Gas del Estado found various legal flaws in the BOT contract and claimed breach of contract. It suspended payments in pesos for the gas, thereby preventing COGASCO from claiming foreign exchange from the central bank under the convertibility guarantee. The Dutch parent company subsequently went bankrupt.

This case, in which the convertibility guarantee was violated de facto but not de jure, shows that the government's underlying capacity to pay rather than carry out the narrow legal enforcement of contracts is what matters. Guarantees focused on particular risks may not be enforceable because the various elements of the contractual relationship may be difficult to disentangle.

International intermediation of selective policy guarantees (through the World Bank, for example) could enhance the credibility of arbitration and enforcement by removing the contradiction inherent in the government's insuring against its own bad behavior. Pricing of the guarantee by the international intermediating agency would also obviate the need for the government to assess and price the probability that it will not fulfill its responsibilities or break its own commitments. Contract enforcement by the international intermediating agency could be done through special sanctioning powers or through policy leverage (conditionality) over government.

Pricing and Administration

Selective policy guarantees provided by government on the basis of some market failure should not be allocated through bidding or market mechanisms, since the kinds of policy guarantees that private investors would find most valuable would be precisely those for which the market would either be unable to set a market-clearing price or would over-price them. Were the market able to price such guarantees appropriately, there would be no need for government intervention.

It is particularly difficult to price guarantees when they are used as a policy commitment device, since the price that private agents would be willing to pay for the guarantee is proportional to how unreliable the government is perceived to be. This may create incentives for the government to create the impression that it is less reliable than it actually is.

Fees could be charged to build a contingency fund to meet future claims and to establish a minimum "willingness to pay" test. However, to the extent that the guarantee is justified as a form of compensating private ventures for the social benefits that cannot be captured privately, subsidization would be inherent in the scheme. The hardest part about designing a guarantee program is in fact in defining the approval process. Allocations from the fund must be based on administrative criteria that take account of government's presumed informational advantage.

Alternative Policy Options

Macro guarantee programs do not target risks precisely enough from a project point of view and therefore introduce potential problems of moral hazard. They may also increase macroeconomic instability by aggravating the fiscal burden in the event of bad policy outcomes when the guarantees are called. For these reasons, guarantees may not be worth the risk. Instead, alternative policy options should be designed to mitigate asymmetries in information or inefficiencies in the redistribution of risks.

Policy reforms should be geared toward making private agents responsible for correctly assessing risks and handling them in the most appropriate manner (managing, absorbing, or hedging them). The policy objective should be to minimize the distinction between commercial risks (which entrepreneurs are expected to be able to assess) and macro risks (which

are sometimes held to be beyond the scope of responsibility of the entrepreneur).

This objective can be met by adopting the following types of policy reforms, which would obviate the need for macroeconomic guarantees:

- Eliminating information bottlenecks that give government a superior understanding of the functioning of the economy and the occurrence of exogenous shocks
- Enhancing the private sector's ability to pool and intermediate macroeconomic risks
- Adopting market-friendly policy commitment devices that will enable private markets to better assess the future behavior of government under a range of circumstances.

Eliminating Information Bottlenecks That Favor Government

Governments sometimes create informational advantages by preventing adequate disclosure of information or by preventing the private sector from gaining experience in certain areas. Policy actions that would reduce such information bottlenecks favoring government might include the following:

- Letting the private sector participate more fully in all types of economic activity through privatization and sectoral liberalization policies
- Prompting disclosure of macro performance statistics, in particular regarding monetary and balance of payments developments
- Creating and making public accurate fiscal accounts, with statements reflecting policy intentions
- Creating a political environment that promotes free and informed debate of economic conditions and policy issues, and establishing more transparent national budgeting processes
- Increasing reliance on the market to evaluate risks and reducing the supervisory role of regulators.

Adopting Market-Friendly Policy Commitment Devices

The government's knowledge of its own future policy intentions gives it an informational advantage over the private sector. This informational advantage is intrinsic to government—removing it would require stripping government of all its freedom of action. Reducing government's ability to "surprise" may, however, help it to promote private initiative and may represent the only way to defeat its time inconsistency problem.

Policy commitment devices restrain government in its own best interest. They include political or market mechanisms, such as checks and balances in policymaking and public accountability; liberalization (particularly of the financial sector) and increased reliance on the price mechanism to allow for more immediate feedback on the impact of policies; international integration and freedom of movement of goods and capital, as a means of "importing" discipline; and a government debt structure that relies on inflation-indexed bonds, which prevents the government from eroding the real value of its liabilities through the expedient inflationary mechanism.

Enhancing the Private Sector's Ability to Intermediate Risks

Certain legal restrictions and penalties hinder the fuller development of private insurance markets. To improve the private sector's ability to deal with macroeconomic risk, the government could adopt financial liberalization, including the freedom to contract on a forward basis; open up capital accounts to permit investors to off-load risks and diversify their portfolios internationally; create a government debt structure that serves as a benchmark for a yield curve; and legally sanction and enforce a greater variety of pledging and bonding devices (through collateral or liens on assets or revenue streams) so that private contracts can better handle credit risks.

In addition, the government can foster the development of insurance markets by reducing taxes on intermediation and creating a benchmark market of inflation-indexed instruments, which would allow agents to implicitly trade on inflationary expectations.

Where financial sector liberalization has been implemented, the menu of financial options used by domestic firms has increased dramatically:

- Inflation-indexed instruments have emerged in Brazil, Chile, Mexico, New Zealand, and the

United Kingdom to lower real interest rates while actually extending maturities. Indexed debt may command real annual rates of up to 5 percent but the equivalent real rates on fixed debt can be four or more times higher.

- As Latin American countries emerged from financial crisis in the early 1990s, local firms tapped foreign capital markets (reflected in the large portfolio flows) to avoid having to pay the local currency risk premium.
- Companies continue to test the market for longer-dated debt issuances to stabilize their debt service and reduce their vulnerability to volatility in local credit markets. ENDESA of Chile was the first Latin American firm to join the select club of 100-year bond issuers.
- Financial institutions are experimenting with new derivative instruments, sometimes embedded in structured bond issues.

The greatest remaining financial challenge in most developing countries is the development of long-dated, self-standing derivative instruments, such as futures and options. Such instruments rarely extend more than a year into the future; when they do they are customized and hence are not easily tradable.

Are Macro Guarantees Consistent with Liberalization?

Liberalization and privatization reforms are designed to get the government out of the business of biasing private resource allocation decisions and bailing out private agents. How consistent are interest rate and exchange rate guarantees with such reforms?

Much of the literature on infrastructure privatization deals with how to get infrastructure business into the private sector. (The focus is on contract design, bidding procedures, and prior requisite enterprise restructuring measures.) The more fundamental—and challenging—issue is how to keep privatized infrastructure businesses in the private sector.

Privatization has often been used to bypass the national budget. Through privatization the government eliminates the need for recurrent financial and managerial support, but it implicitly retains some financial liability, since privatized companies often turn to the government for financial support in the event of financial difficulties. In effect, the government substitutes a contingent liability for a recurrent liability, as the owners of newly privatized infrastructure projects often acquire an option to put (sell) the project back to the government. This has led to the familiar privatization/nationalization cycle, which reflects both the government's thirst for control over resources and its inability to relinquish responsibility for losses. The asymmetric incidence of normal business outcomes under such circumstances (private profits, social losses) undermines the efficient provision and operation of infrastructure. If widespread it may thwart macroeconomic stability by placing a large financial burden on the government at the worst possible time, during periods of economic or financial turbulence.

The problem arises when government cannot distance itself from market outcomes. There are three interrelated reasons why this may be the case. First, if the population has come to expect a certain amount, quality, and cost of service, as is commonly the case in infrastructure services, the prospect of business failure—and the accompanying risk of service interruption—forces government to step in to prevent failure before responsibility can be clearly established. Second, if an overly restrictive regulatory framework and heavy-handed government involvement is perceived to have precluded better outcomes, the failings of regulatory actions and commercial decisions may be inextricable, and the government must assume full responsibility. Third, if market outcomes stem fundamentally from an unstable macroeconomic policy environment—factors entirely beyond the control of private providers—the government assumes responsibility.

For some, macro guarantees are just a perpetuation of this blurring of responsibilities between the public and private spheres. For others, such guarantees restrict government's involvement by carefully circumscribing those liabilities that it cannot or should not escape. Guarantees also create financial incentives for the government to behave in order to avoid paying claims, thereby improving the credibility and effectiveness of its policies. Critics of guarantees retort that booby-trapping government with huge macro costs in the event of a crisis is no way to seek public confidence.

Guarantees on interest rate- and exchange rate-related risks are triggered by both bad policies and bad luck. The fact that it is sometimes difficult to distinguish between these two factors means that the incentive effects on government will be eroded. Guarantees also put the government in the position of having to assess the likelihood that its policies will lead to some unfavorable interest rate or exchange rate movement, something it cannot be expected to do truthfully or accurately. In fact, if it did, it would be open to the charge of "doing the right thing" only if paid to do so through guarantees.

Macro guarantees are no panacea, since they generate disincentives for government and private agents that erode their supposed benefits. Moreover, the adverse effects of guarantees are larger the longer they have been in place; their value as a policy commitment device is greatest over short time spans, since government's policy intentions can be directly observed after some time. Over the longer term a policy of systematically guaranteeing macro risks is inconsistent with a policy of liberalization and privatization.

When Are Macro Guarantees Appropriate?

Although guarantee programs are ineffective in the longer-term, they may support private infrastructure as an interim measure while reforms are put in place that will allow the financial sector to handle exchange rate- and interest rate-related risks on its own. Before the reform process actually bears fruit, government needs to assess the relative merits of promoting private infrastructure investments through a limited guarantee program versus sticking to a purist market-based reform program that may delay necessary infrastructure development.

A guarantee program that is actually designed to be phased out over a period of five to ten years has the dual advantages of raising the credibility of the government's reforms and building public support for the reforms by allowing some benefits from the reform process to materialize earlier. Such a program may be warranted under certain conditions (figure 5.2):

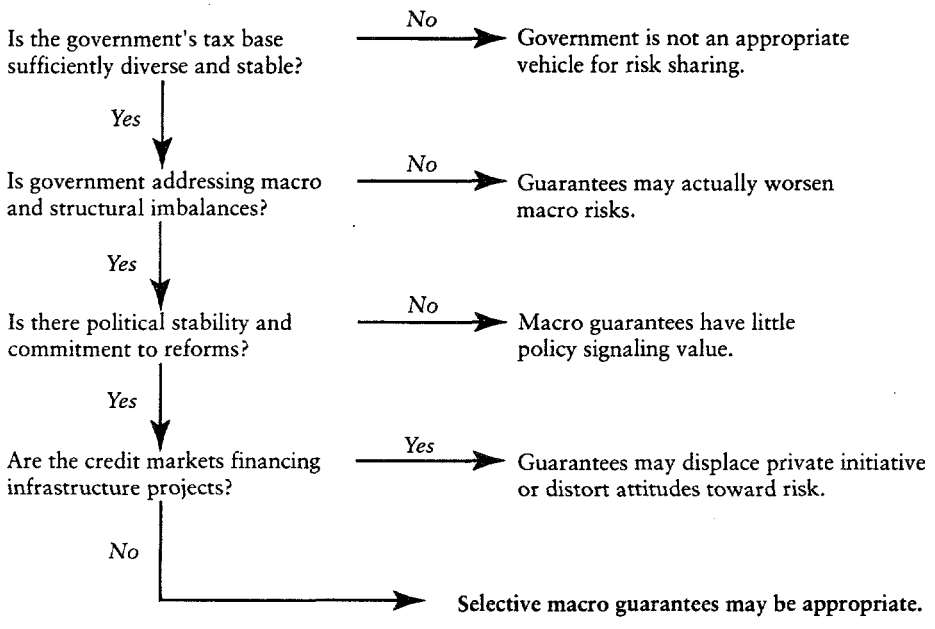
- Government must be in a good position to intermediate macro risks through its taxation mechanisms. If government revenue sources are very concentrated or there is a high correlation between its tax bases, guaranteed risks will be passed on to taxpayers.
- Guarantees must fit into a broader context of structural reform, since their signaling value will endure only until government's true intentions are revealed through its actions. If the economy remains structurally unsound, the risk of a macro crisis remains high and the fiscal burden of guarantees may actually aggravate the crises.
- The reforms and the guarantees must be credible, which requires political stability and a resolve to maintain the reforms and the contractual terms of the guarantees. If the private sector does not believe that the policy regime will be maintained, guarantees will not generate any of the positive incentive effects they are supposed to induce.
- The guarantee program should accompany an economic reform program, not spearhead it. Guarantees are by their very nature contrary to the overall spirit of reform; their signaling role is to demonstrate commitment to ongoing reforms rather than to point the direction of the reforms. For this reason guarantees should not be issued in the first three to four years of a reform program. They should be introduced once the overall objectives of the reforms have become widely established and political commitment has been demonstrated (perhaps after a change of government that preserves the direction of the reforms).
- Guarantees should be offered only to worthwhile projects that would not otherwise be financed privately. Private initiative should not be displaced.

Conclusion

The main conclusions of this chapter can be summarized as follows:

- The policy signaling value of guarantees is debatable. The volume of guarantees outstanding must be sufficiently large to induce government to change its macro policies. But, the volume of guarantees outstanding cannot be so large that it dissuades the government from

FIGURE 5.2
Determining whether selective macro guarantees are appropriate



adjusting interest rates or exchange rates when they become unsustainable for fear of incurring large fiscal losses.

- Macro guarantees cannot be expected to be very credible when there is a threat of large adjustments in the exchange rate or inflation, when the political environment is shaky, or when government appears likely to abuse its ultimate enforcement role. Thus the more assurance the private sector requires, the less useful the guarantees become as a policy device.
- Even if they are carefully targeted, macro guarantees run the risk of perpetuating the image of the state as the residual absorber of risks. Moreover, by shielding private agents from macro outcomes, guarantees may aggravate the underlying informational asymmetries favoring government.
- A policy of guaranteeing macro outcomes makes sense only as an interim policy while a broader set of reforms are being implemented that will make guarantees unnecessary in the medium term.
- Rather than simply absorbing the risk itself, wherever possible government should strive to eliminate the information and transaction cost asymmetries that would place it in a better position to absorb risks. Financial liberalization, in particular, should be deepened to provide the private sector with vehicles for trading in macro risks.

Notes

1. Governments generally acquire equity stakes not simply to share risks efficiently but also to achieve other policy objectives (such as employment generation or preservation, national security, or other social objectives). Moreover, risk sharing is not the only form of implicit financial assistance that public companies receive. Generally, public enterprises have preferential access to some factor or product markets, through subsidized credit schemes or monopoly rights.

2. This would imply using a risk-free rate for discounting public investments, as prescribed by Arrow and Lind (1970). See Bailey and Jensen (1972) for a critical review of private versus public risk bearing and the implications for the social rate of discount.

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Comments on "Managing Exchange Rate- and Interest Rate-Related Project Exposure: Are Guarantees Worth the Risk?"

William H. Chew, Standard & Poor's Ratings, New York

Ignacio Mas presents a refreshing approach to issues that credit analysts, lenders, and project developers encounter in raising debt capital for private infrastructure projects. His chapter correctly highlights several important aspects of guarantees, many of which need to be more fully considered by both governments and the private sector.

First, there are inherent limits to guarantees. From a practical perspective the basic premise of many guarantees is flawed. The countries perceived as being in greatest need of guarantees are often precisely the countries in which such guarantees may have little value. This is because the very government that is providing the guarantee is also the party orchestrating the actions the guarantee is designed to cover. In the case of sweeping events or changes, especially when part of a broader policy shift, governments will find it difficult to enforce the guarantees. Thus guarantees, like other forms of contractual credit support, are effective only when they are aligned with strong economic and business incentives to support them. Guarantees that fly in the face of political reality, no matter how artfully drafted from a legal perspective, may not be worth much.

Second, there is no free lunch. For a guarantee to have value the party undertaking it must accept the risk that it may be called in. But governments, and even some private sector participants, rarely identify and measure the risks they undertake. As a result risk allocation arrangements may not be as airtight as they appear. Risks are especially difficult to identify and measure when they are covered indirectly through potentially sweeping pricing formulas. Power tariffs and transport tolls that are indexed to transfer currency risk, for example, have the potential to raise prices for essential services precisely when countries are least able to handle the increase. The existence of the guarantee does not necessarily change the underlying risk.

Third, it is difficult in practice to unbundle risks. Most agree that markets are able to handle commercial risks well but have a hard time managing political and governmental risks. Separating these risks is often difficult because the distinction is artificial, as different types of risk are often intertwined. For the credit analyst the real issue is the way in which the distinction between the risks is handled under project documents and the record of the host country in handling those risks. For many projects, the distinction may be an invitation to debates of interpretation and thus a source of potential risk of projects.

Guarantees and risk covers will continue to play an important role in raising debt capital in many countries. To facilitate the efficient flow of longer-tenor debt, practical steps must be implemented to move both governments and project sponsors toward markets in which guarantees are the exception rather than the rule.

6

The Management of Contingent Liabilities: A Risk Management Framework for National Governments

Christopher M. Lewis and Ashoka Mody

ABSTRACT

Policymakers view privatization as a way of reducing the government's fiscal burden. But explicit and implicit government guarantees provided as part of the privatization process often expose governments to considerable risk—which is rarely reflected on the government's balance sheet. The contingent nature of this risk exposes governments to the possibility of sudden and substantial obligations over a short period of time, which could lead to severe fiscal problems. As the pace of privatization accelerates, governments' exposure to risk is rising, underscoring the importance of an integrated approach to risk management.

For a governmental institution, integrated risk management involves: (a) identifying and classifying the risks faced; (b) quantifying the government's exposure from these risks; (c) including those measures of risk in the budgeting process; (d) identifying the government's tolerance for risk; (e) establishing policies and procedures for structuring unexpected loss reserves; and (f) implementing systems for monitoring and controlling exposure over time. Use of integrated risk management systems will vastly improve governments' ability to manage and control risk and will enhance their efforts to improve the allocation of resources in the domestic economy.

Of course, the focal point of any government risk management program is the systems used for accounting and budgeting for contingent liabilities. Governments are often unaware of their exposure because of their use of cash-based budgets. Cash-based budgeting masks the contingent exposure and creates perverse incentives for issuing guarantees. By not accounting for the budgetary costs of issuing guarantees a simple cash budget encourages the expansion of guarantee liabilities without requiring the government to reserve against future losses. It allows political leaders to increase financial assistance to target groups without being held accountable for the costs of providing the assistance, which will be realized under ensuring administrations. To improve the allocation of resources governments should follow the lead of the private sector and move to a present value basis of accounting.

During the transition from public to private ownership and management, governments often provide various kinds of support, including commitments to make streams of payments in the future. Some of those payments are deferred payments, and the government in effect transfers the financing off its own balance sheet as it enters into a financial lease arrangement. Some commitments are contingent, that is, they come due only if particular events transpire. Contingent obligations, such as guarantees, require no immediate cash outlay and are therefore often favored as a method of support. However, guarantees represent real liabilities and can cost as much as a third of the amount guaranteed (see Mody and Patro 1996). Moreover, these liabilities increase as government activities are moved to the private sector through privatization. Only recently have government auditors and Treasury officials begun to recognize the continuing fiscal implications of infrastructure privatization.

Contingent liabilities arise in a variety of contexts. Recently, the move to place infrastructure provision in private hands has led to a variety of guarantees that represent a significant liability for governments. In many developing countries government guarantees are also used to support other private sector activities. In addition, government guarantee programs support pension liabilities, export credits, and agricultural support. Furthermore, governments typically provide the contingent support to individuals, companies, or projects considered too risky for private financial institutions. The full extent of these liabilities is not known, because no attempt has been made to systematically estimate them. In some parts of the world, however, government guarantees may soon represent an unmanageable level of exposure, not only because of their size relative to the size of the government's balance sheet but also because their contingent nature implies the possibility of sudden and substantial obligations due over a short period of time.

However, governments have made little effort to develop their own systems for managing risk. As a result, governmental programs have been at the center of some of the largest risk-related losses. In the United States, for example, the savings and loan debacle in the 1980s cost taxpayers more than $130 billion. Other countries are facing a similar escalation of costs from deposit insurance programs. In some instances last minute government action averted a serious budgetary crisis (U.S. pension insurance). In other cases, improvements in the economy helped prevent a crisis from occurring (U.S. deposit insurance for commercial banks). In many cases, however, existing and growing contingent liabilities could significantly aggravate the next budgetary crisis.

Drawing on recent advances in the private sector, this chapter outlines a risk management agenda for national governments. It develops a framework for improving the assessment, measurement, budgetary control, and management of risks and demonstrates how this framework can be applied to contingent infrastructure liabilities. It also examines how the implementation of an integrated framework for risk management can be used to improve the ability of the government to design programs that target specific risks in a transaction, allowing the public sector to leverage private capital.

Section 1 identifies the main components of any integrated risk management system and shows how private firms use this framework to improve their own business operations. Section 2 shows how this risk management framework can be adapted to the needs of a government institution. Section 3 describes tools and techniques for identifying risk and quantifying risk exposures. Section 4 describes alternative budgetary approaches to managing the expected payouts under contingent liabilities. Section 5 demonstrates how reserves against unexpected losses enable governments to manage the volatility in budget expenditures. Section 6 highlights the advantages of a comprehensive risk management system that induces clarity of contract design, minimizes incentives that lead to a call on guarantees, and implements a regular monitoring process. The last section summarizes the chapter's conclusions.

An Integrated Enterprise Risk Management Framework

The goal of corporate risk management today is not to manage a fixed set of risk exposures of an enter-

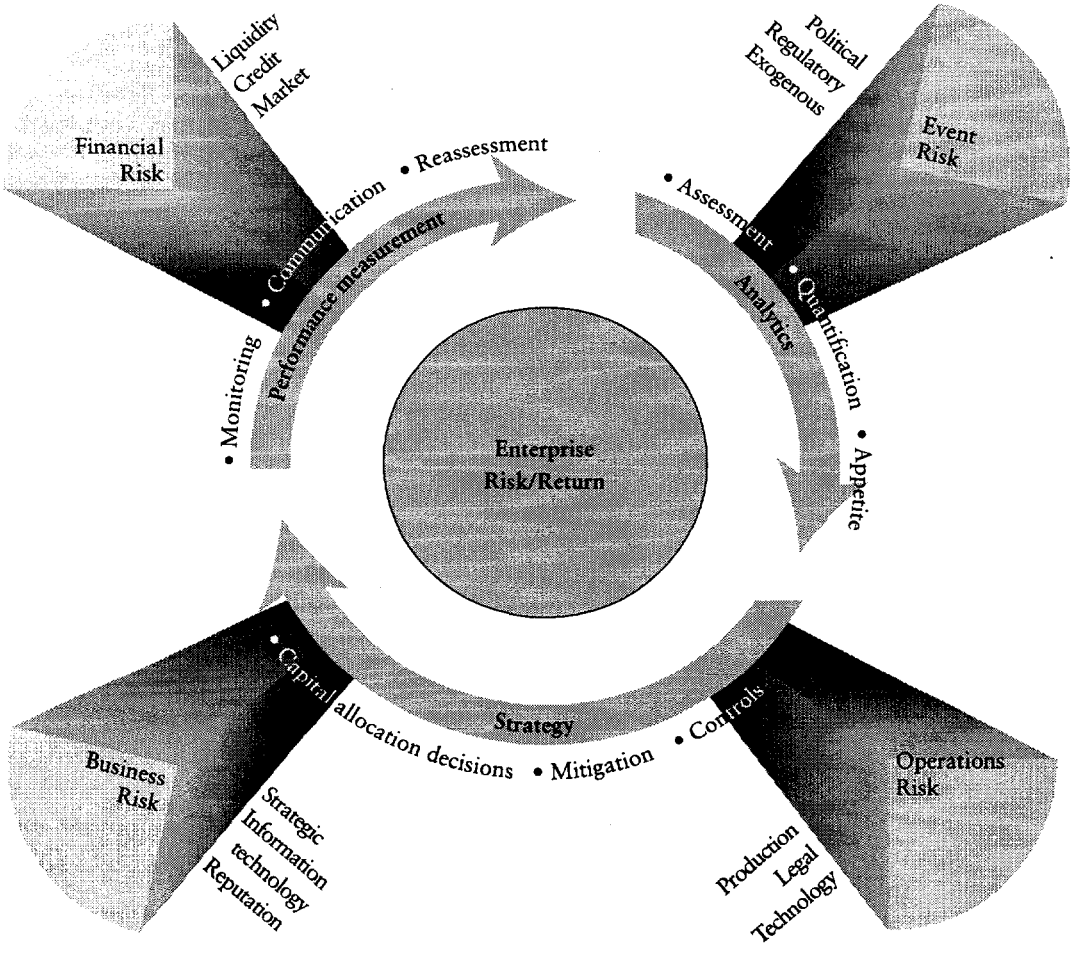
prise, but to determine the areas and lines of business in which a company is willing to retain risks in order to generate target returns. An integrated approach to corporate risk management helps a firm optimize the trade-off between risk and return so as to maximize the firm's overall risk-adjusted rate of return on equity and its shareholder value.[1]

Over the past several years many large multinational firms have implemented enterprisewide systems for risk management. Microsoft Corporation, for example, has just completed building an elaborate risk management system that quantifies more than 144 different types of risk exposures. For each risk identified as important, Microsoft determines the best approach for improving its management of exposure by insuring, transferring, mitigating, or retaining the risk. The system allows Microsoft to focus on managing the business risks associated with succeeding in its core market. Bankers Trust, Chase Manhattan, and Analog Devices have initiated similar systems.

An integrated risk management process should perform six major functions (figure 6.1):

- Identifying the firm's risk exposures
- Measuring or quantifying those exposures
- Assessing the firm's tolerance for risk-bearing
- Making strategic decisions on the allocation of capital to support risks that are borne
- Implementing risk mitigation and control mechanisms to prevent unintended losses on those risks and establishing systems to continually monitor and reassess the firm's risk exposure over time.

FIGURE 6.1
Integrated enterprise risk management: Optimizing enterprise returns under uncertainty



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BOX 6.1

Management of contingent liabilities in the Philippines

The government of the Philippines responded to a critical national power shortage by providing "full faith and credit" guarantees to private sponsors against the risk of payment default by the National Power Corporation (NPC), the public power utility buying power on long-term power purchase contracts from private generators under a BOT arrangement. The government waived its right to sovereign immunity, thereby accepting international arbitration in the event of a dispute.

Provision of free guarantees was crucial to the financing of substantial generation capacity (about 3000 MW), which alleviated the power crisis. But it meant that sponsors and lenders came to expect that such all-inclusive guarantees would always be available.

Recognizing that guarantees are neither desirable nor sustainable, the government issued a consultative document in March 1995, making specific recommendations for better management of its contingent liabilities (Government of the Philippines 1995). The government acknowledged that guarantees could not be eliminated abruptly and that a transition was required during which the legitimate risk mitigation needs of private parties would be met while an improving performance gradually allowed various elements of the guarantees to be eliminated.

A key feature of the policy was unbundling risks to allow more flexible management (table). Certain core guarantees of government obligations of "fundamental rights" under a project were seen as legitimate for the government to offer to establish a record of policy performance. Other guarantees, including the guarantee of currency convertibility and the risk of nonpayment of obligations by NPC, were seen as temporary and were also subject to higher fees. The consultative document recommended withdrawing certain guarantees (such as the guarantee of currency convertibility if the Philippines attained investment grade credit rating and the guarantee of NPC payment obligations if NPC attained investment grade rating). It also recommended limiting guarantees to 80 percent of total project costs in order to require equity investors to bear their share of project risks, developing model guarantee documents that would form part of the bidding package for prospective project sponsors, and instituting internal controls (including accounting for and reserving against guarantees).

A set of model guarantee documents was produced and is now being used in specific projects. The first project to which the approach was applied was the Renon Toll Road, which runs from Manila to Cavite. The key element guaranteed was the tariff formula. Since no guarantee was provided for traffic or revenue volumes, no payment obligation akin to the power purchase agreements was incurred by the government. The guarantee of foreign exchange convertibility provided only for equal treatment, as specified in current Philippine law. The new approach is also being applied to major power projects currently under negotiation, including the $300 million San Pascual Cogeneration Facility. In all of these projects the government is using the new guarantee package to pare back its contingent liability and to provide a means for reducing liability even further when the need for a particular form of guarantee diminishes. Discussions are continuing with the sponsors. The policy is also being used for new water projects coming on stream.

Managing exposure under guarantees through unbundling risks

Risk	*Nature of guarantee*		*Fee charged*[a]
	Core guarantee	*Noncore guarantee*	
Sovereign risks			
Concession terms, expropriation, tariff formula, tax incentives	Terms define basic rules are largely under government control		None
Obtaining of licenses, permits, right-of-way	Government commits to facilitating process. Risks mot fully under central government control.		25 basis points
Foreign exchange risk			
Convertibility of foreign exchange	Government assigns priority. Risk not fully under government control		25 basis points for the priority accorded
Market risk		Not under government control.	50 basis points initially to reflect commercial risk.
Credit risk		Transitional need to make project financeable.	No initial charge. Fall-away provisions when credit benchmarks are achieved.

a. Fee charged is indicative only.
Source: Government of the Philippines 1995.

(Box continues next page.)

These functions are used to manage the four broad categories of risk: financial, operational, business, and event risk.

Using Enterprise Risk Management to Manage Government's Contingent Liabilities

A similar integrated enterprise risk management framework can be adopted by any government institutions to help them maximize social returns.

Unlike private firms, government needs to approach risk management from an economywide perspective. Implementation of a risk management system is useful in this regard, since it provides governments with another tool with which to identify which risks should be borne by the government and which should be borne by the private sector.

Each of the six functional areas of a comprehensive risk management system can be implemented by governments to improve management of their contingent liabilities, and specifically, their infrastructure liabilities. Of course, implementation of the framework in a particular country would require significant adjustments to reflect the structure and dynamics of the national government, the budgetary and regulatory processes, the legislative and legal environments, and the risks being evaluated.

Identifying and Quantifying the Risks

The government's exposure to loss can arise from a wide variety of events. Attempting to account for every source of exposure is not feasible. A systematic approach to identifying the principal risks is needed to ensure that all relevant exposures of a program can be classified.

One approach to risk assessment is that adopted by federal regulators of financial institutions in the United States and Europe. With limited staff resources federal regulators have evolved a top-down, risk-focused approach for conducting risk management examinations of financial institutions. Regulators first examine an enterprise's general categories of risk (financial, business, operational, and event risks) then focus their scarce resources on the highest risk areas. This process yields a risk identification lattice (figure 6.2).

Using a similar approach a government can assess its own risk exposures in a particular program. The advantage of this top-down approach is that the government can focus resources on those risk categories, classes, or risk types for which exposure is greatest. This approach economizes on scarce resources and it minimizes disruption that may be caused in the private sector by excessive government audits.

A risk-focused assessment procedure was worked out in the El Cortijo-El Vino toll road project in Colombia (box 6.2). The assessment determined that the greatest exposures for the Colombian government were from the market risks associated with traffic volatility and from construction cost overruns (figure 6.3). Early recognition of these risks allowed the Colombian government to improve its risk management techniques and contract specifications for toll road projects.

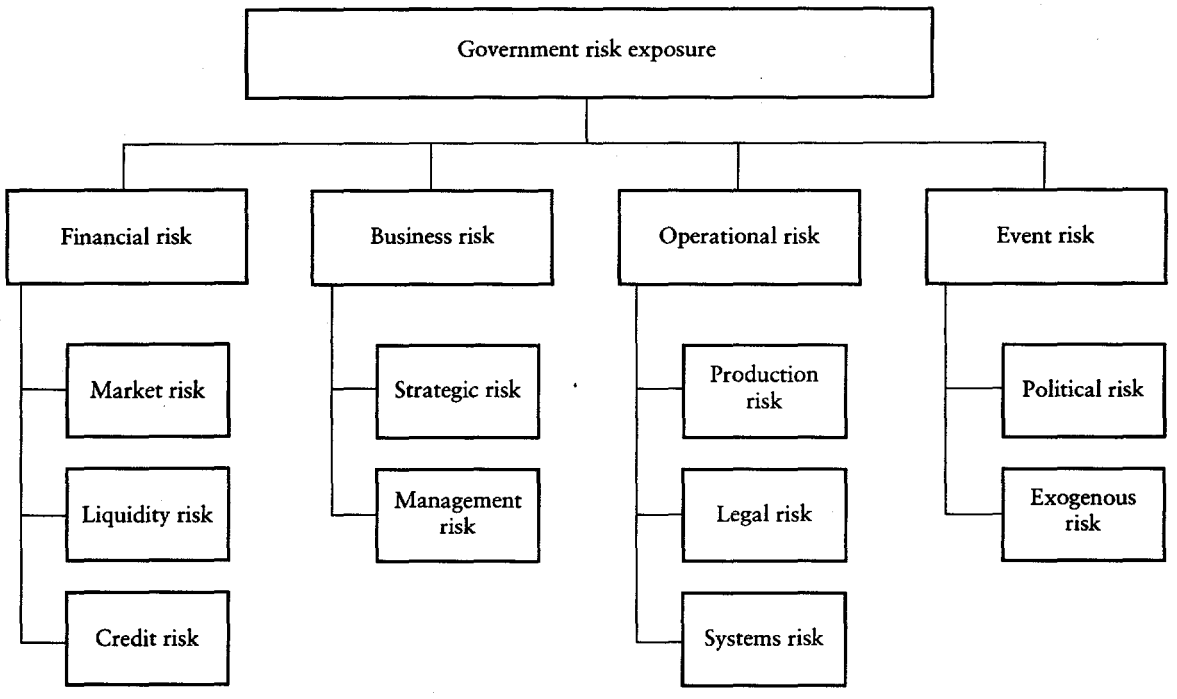
Once a central government goes through the process of identifying the risks it faces and gains a better understanding of its risk exposures, the valuation or quantification process can begin. A wide variety of techniques exists for quantifying different types of risk. The techniques used depends on the type of risk being analyzed. (Although this chapter addresses the application of these techniques to the contingent liabilities of a government, these tools can be used to manage risk on the government's entire balance sheet.)

Actuarial or Statistical Techniques

Where a large body of data exists on prior losses or data can be augmented using statistical techniques, actuarial methods that estimate future loss patterns based on prior loss experience (including trends) are often used to quantify the government's exposure to loss. Actuarial techniques, which have been used to assess insurable risks for almost two centuries, can be used to assess the magnitude of a wide variety of risk exposures.

Actuarial techniques use the loss history of a given program—or comparable programs—to estimate an annual expected loss distribution. This annual expected loss distribution is then adjusted to reflect current trends in loss frequency and loss severity, as well as any changes in the sharing of risks between the government

FIGURE 6.2
Risk identification lattice



and the insured party. If the annual adjusted loss distribution is assumed to remain stable over time (adjusting for any time trend), the distribution can be used to estimate the expected and unexpected costs of the program in any given year. Discounting cash flows using a risk-free rate of interest yields estimates in current dollars.[2]

Econometric Models

A deficiency of actuarial models is that they do not attempt to explain the patterns of loss they identify and thus cannot be used to forecast nonlinear trends in loss patterns, as in the case where the risk sharing between the government and the private sector change over time. This shortcoming can be significant, especially when analyzing the performance of credit programs that are sensitive to economic fluctuations.

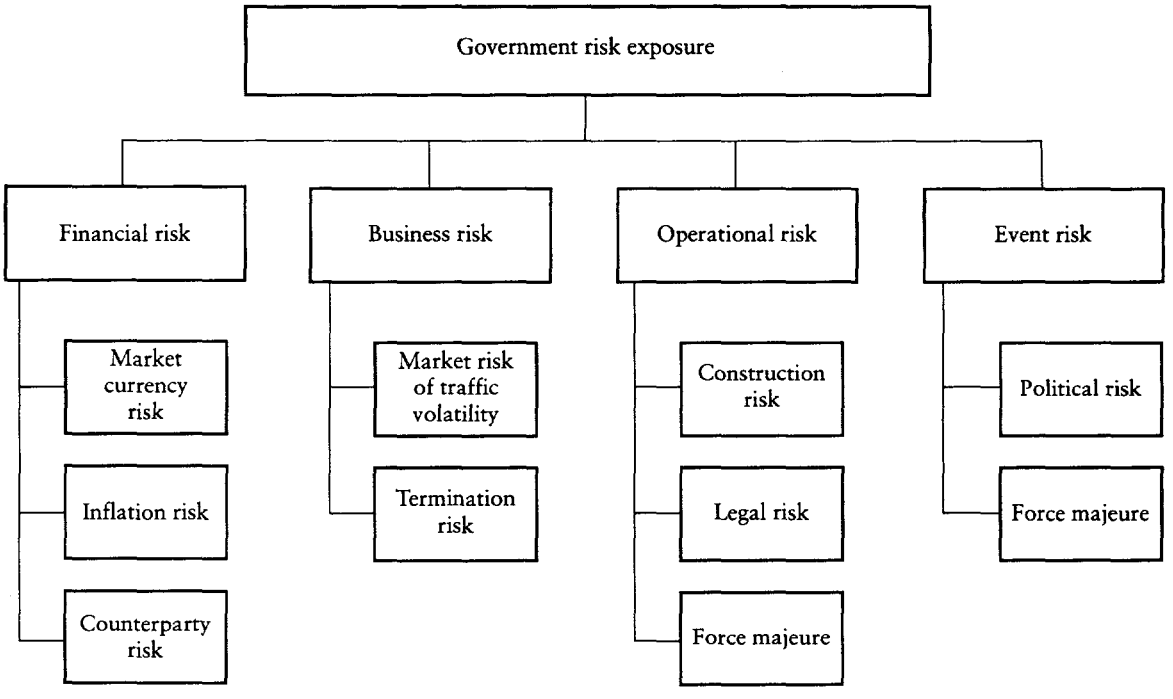
Econometric methods can be used to show how the expected loss distribution of a program may change over time based on the pattern of underlying economic or financial factors. By forecasting future movements in these factors, econometric models can be used to compute how these loss distributions may change over the life of the program. Incorporating econometric analysis into the parameterization of the expected loss distribution allows the government to:

- Model economic and financial trends that may influence the pattern of losses within a program,

BOX 6.2
Identifying which risks to guarantee in the Colombian toll road project

The Colombian government provided two basic forms of assurance to support the toll road project, a construction materials overrun guarantee and a traffic volume guarantee once road construction was finished. Under the terms of the cost overrun guarantee the government would cover 100 percent of the cost of material overruns that were 30 percent of the original construction design bid, 75 percent of the cost of material overruns that were within 30 to 50 percent of the original construction design bid, and 0 percent of the cost of material overruns that were more than 50 percent higher than the original construction design bid. The traffic volume guarantee committed the government to reimbursing the concessionaire if traffic volume falls 10 percent below the traffic volume projections agreed to in the budget for the project. If traffic volume exceeded projections by more than 10 percent, the additional revenues associated would be deposited in a reserve fund used to cover future shortfalls in traffic volume or for road maintenance and improvements.

FIGURE 6.3
Sources of risk in the El Cortijo–El Vino toll road project



allowing for more dynamic projections of losses and the incorporation of loss events for which there is no historical precedent

- Identify factors that affect loss behavior, so that actions can be undertaken to mitigate losses
- Improve the ability of an underwriter to evaluate the riskiness of program participants based on the characteristics of the participant or factors affecting the participant.

One useful application of econometric modeling is in identifying the loss patterns associated with credit risk. When the government provides a direct loan or protects a third party against the default of a borrower, it exposes itself to the risk that the borrower will default. When it lends directly, the government also faces prepayment risk exposure—the risk that the borrower will repay the loan early, leaving the government exposed to a loss of interest and to reinvestment risk. Both credit and prepayment risk can be affected significantly by conditions in the economy (such as a drop in interest rates, which usually leads to an increase in mortgage prepayments as homeowners that have higher-coupon mortgages refinance). Econometric models can be used to assess how these risks vary across time with changes in the underlying economy.

Over the past twenty years econometric models have become increasingly sophisticated and powerful, evolving from simple ordinary least squares models to logistic regressions, to nonlinear regression models and complex hazard functions. Quercia and Stegman (1992) provide a detailed review of the evolution of econometric techniques and models just within the mortgage industry. Default/prepayment models are also available for small business loans, consumer loans, and credit card receivables.

Both actuarial and econometric models require substantial data inputs on the performance of a program (or comparable program). Project finance, where deals are unique and data records are often missing or of low quality, more advanced modeling approaches are required, including stochastic simulation analysis and contingent claims models.

Contingent Claims Analysis

Contingent claims analysis is a powerful technique for estimating the value of a loan guarantee, direct loan,

or insurance program—in isolation or as part of a complex layering of risks. It is particularly useful when historical data on the performance of a program are not available. Contingent claims are assets (or liabilities) whose values on a specified future date are uniquely determined by the prices of other traded securities. The classic example is a European call option issued on an underlying stock—that is, an option to buy a stock at a specified exercise or strike price on a specified date in the future.

In a seminal paper Black and Scholes (1973) demonstrated that the price of a European call option can be valued using only the value and instantaneous variance per unit time of the underlying asset, the term of the option, and the risk-free rate of interest. Merton (1973b, 1977) followed with a more generalized theory of contingent claims pricing that allowed for the development of new models to price all types of assets whose payoff structure could be linked to an underlying security. Since 1973 techniques have been developed to value a wide array of financial and nonfinancial instruments, including complex financial options, corporate liabilities, third-party guarantees, employee compensation, insurance products, and more recently, the value of capital investment decisions, or "real options." Development of a theory of rational options pricing helped foster the expansion in the financial markets over the past twenty-five years.

Contingent claims analysis is also an extremely powerful tool for analyzing government loan guarantees, direct loans, and insurance programs. Merton (1977) used a modified form of the original Black-Scholes options pricing equation to determine the value of deposit insurance in the United States. Marcus and Shaked (1984), Pennacchi (1987b), and Cooperstein, Pennacchi, and Redburn (1995) expanded this work. The use of contingent claims analysis was also extended into other areas for assessing the value of government liabilities, including federal loan guarantees granted to corporations (Sosin 1980), mortgage guarantees (Foster and Van Order 1985; Cooperstein, Redburn, and Meyers, 1992; Kau, Keenan, Muller, and Epperson 1992), state guarantee funds supporting insurance company failures and federal pension insurance (Lewis and Cooperstein 1993; Hsieh, Chen, and Ferris 1994; Pennacchi and Lewis 1994).

This approach has been used by the federal government in the United States since 1992, when the Office of Management and Budget adopted contingent claims models for deposit insurance, pension insurance, and mortgage guarantees to help it forecast budget costs during the five-year budget window and beyond. Contingent claims models have also been used to compute a range of expected long-term costs for these programs, which have been published in the federal budget. While contingent claims models have not being used directly to determine the expected cash outlays in each year of the budget window, these models have been used as part of the federal budgetary process.

To understand how contingent claims analysis is used to value government guarantees, insurance, and direct loans, it is important to first understand the financial equivalence of each of these instruments from the perspective of risk. When a government institution issues a direct loan, it transfers cash to the borrower in exchange for a promissory note of repayment and collateral, usually in the form of a down payment and a secured interest in the value of the underlying asset that was purchased with the borrowed funds. If the loan were risk free—that is, if the probability of a loss on the loan were zero—there would be no need for the collateral interest, and the government could record the full value of the loan repayment as an asset on its balance sheet. Direct loans are rarely risk free, however, as the borrower has the option to default on the note and transfer the underlying collateral to the government. In fact, the borrower could be expected to default on the loan if the costs of default (the loss of collateral and all transactions costs, including penalties) were less than the benefits associated with continuing to make payments on the loan. Thus, as Merton and Bodie (1992) showed, the issuance of a direct loan is analogous to bundling two separate transactions—the issuance of a risk-free loan and the underwriting of a put option with an exercise price of the outstanding value of the loan and an underlying asset represented by the collateral securing the loan:

Value of Risky Direct Loan = Value of Risk-free Loan – Value of Default Put Option.

A rational borrower is expected to default on a home mortgage if the value of the outstanding loan (L) exceeds the value of the underlying house by more than the transactions costs and penalties (P) of defaulting. The payout of this default option is identical to the government underwriting a put option on the underlying value of the house (V), with an exercise price equal to the sum of the loan and the costs of default ($L + P$).

The only difference in the case of a 100 percent loan guarantee is that the transaction is unbundled. A private bank issues the risk-free loan, and the government underwrites a put option in the form of a loan guarantee given to the bank issuing the loan. Thus:

Value of Risky Direct Loan = Value or Risk-free Loan – Value of Loan Guarantee.

or

Value of a Loan Guarantee = Value of a Risk-free Loan – Value of Risky Loan.

It is straightforward to show the equivalence between the structure of an insurance policy and a contingent claim. When the government underwrites a loan guarantee the government is providing assurance to other parties that it will bear the risks associated with borrower default. A loan guarantee is thus analogous to a credit insurance policy against borrower default.

This analogy also applies to layered insurance or reinsurance policies. Excess-of-loss reinsurance provides protection for losses (L) that exceed some trigger level (T) based on what the reinsured party can absorb. Once an event exceeds this trigger the reinsurance pays some fixed proportion of losses (L), usually up to some predetermined cap (C) on the reinsurer's exposure. If losses are less than the trigger, the insurer pays nothing. If losses fall in the range between the trigger and the cap, the insurer pays out the difference between the loss coverage and the trigger. If losses exceed the cap the insurer pays the difference between the cap and the trigger. Using this basic structure, Lewis and Murdock (1996) show that the payout (P) of the reinsurance can be specified as follows

$$P = \text{Max}[0, L - T] - \text{Max}[0, L - C].$$

For a reinsurer the first term in the equation is analogous to being short (that is, having underwritten) a call option that allows the primary insurer to "call" on the resources of the reinsurer to pay for losses that exceed the threshold insurance trigger. The second term in the equation is analogous to the reinsurer's being long (that is, having purchased) a put option that allows it to "put back" to the insurer any losses that exceed the reinsurance cap. Thus the reinsurance contract is simply the difference between a put option and a call option written on the underlying exposure of the insured event, or a call spread option. If the trigger is defined as deductible a similar argument can show how a standard primary insurance contract can be expressed as a financial option.

The techniques used to value financial options are, then, directly applicable to the valuation of direct loans, loan guarantees, and insurance contracts granted in the process of supporting infrastructure liabilities. Governments can use options pricing theory to formulate a more accurate assessment of their aggregate risk exposure in project finance and other areas.

Valuing Guarantees in Infrastructure Projects: Applications from Colombia

In 1996 the Colombian government and the World Bank collaborated to quantify the risk exposure of three project finance transactions. The purpose of the effort was to establish the viability of a methodology to obtain estimates of the government's exposure. To the best of our knowledge this was the first time that a sophisticated contingent valuation methodology was applied to government infrastructure projects by central government.

A generalized form of contingent claims analysis was used to evaluate three infrastructure finance projects: A toll road project (El Cortijo–El Vino), a telecommunications joint venture (Telecom–Siemens), and an energy sector project (CORELCA).

To value these transactions, the diffusion process for all of the state variables underlying the risks in each project was first specified. Yearly changes in prices (including exchange rates) and demand vol-

umes were assumed to follow a correlated lognormal process. The frequency of losses as a result of event risks (force majeure, counterparty failure, termination risk, and convertibility risk) was assumed to a binomial distribution with a constant loss severity rate. The evolution of discretionary events, such as advertising costs, was assumed to follow a uniform distribution.

The means of these distributive processes were derived from the best information available on each project or from experience in other markets. Variance estimates were derived from an examination of the variability of the cash flows on each project or, when unavailable, from the best market comparable. Covariance estimates between project cash flows was based on best guesses or was assumed to be zero.

Using these estimates, the project used stochastic simulation techniques to identify the net expected loss from each project. To provide a better understanding of the decomposition of risk exposures within each project, the study also tried to analyze the marginal increase in the government's exposure associated with bearing each additional type of risk. Given the impact of diversification, marginal risk analysis understates the risk exposure of each element (Merton and Perold 1993). To compensate, any residual risk was allocated to each risk category in proportion to the overall risk exposure (table 6.1).

The market risk exposure associated with traffic volatility and the risk of construction overruns were identified as the largest risks in the El Cortijo–El Vino toll road project. The total expected loss to the Colombian government from these two guarantees was about $4.2 million. A small counterparty risk associated with the failure of Corfigan, the reinsurer of the construction companies involved in the project, was also identified.

Regulatory/market risk and construction risk were identified as the largest risks the telecommunication project. Regulatory/market risk exposure—stemming from Colombia's deregulation of telecommunications, which ended the monopoly held by Telecom—was estimated at $10 million. The second largest risk in the venture was construction risk, estimated at $9.8 million. Whether this risk is borne by Telecom or Siemens is not clear from the contracts. Telecom has nominal responsi-

BOX 6.3

Providing support to the Barranquilla power plant expansion in Colombia

The government of Colombia supported the $755 million expansion of the 240 megawatt Barranquilla thermal power plant in various ways. The new 750 megawatt plant will be constructed by TEBSA to provide power to CORELCA. TEBSA, Termobarranquilla S.A., is a special purpose vehicle, capitalized by the old Barranquilla thermal plant, now jointly owned by CORELCA and ABB Distral. CORELCA is an undercapitalized, state-owned power distributor on Colombia's Atlantic Coast that runs a narrow-margin energy distribution service.

Government support in the expansion of TEBSA consists of a power purchase agreement between CORELCA and TEBSA, three guarantees, and a subordinated loan.

- CORELCA enters into a power purchase agreement with TEBSA, under which CORELCA agrees to make capacity payments to TEBSA for the first twenty years of the plant's operation. As long as the plant is operational CORELCA has to pay a schedule of fees that start high and decline over time.
- The Ministry of Energy then guarantees CORELCA's ability to make these capacity payments to TEBSA in the case of a CORELCA default. That is, FEN essentially underwrites a put option giving CORELCA the right to put the capacity payments issued under the power purchase agreement, along with the right to future revenues from the power from the TEBSA plant, to the government in the event that CORELCA fails.
- The Colombian government then provides a guarantee that FEN will be able to honor its commitment to make payments under the CORELCA power purchase agreement if CORELCA defaults.
- To prevent CORELCA from failing FEN takes a subordinated debt position in CORELCA to help ease a short-term liquidity crisis that would have forced CORELCA into insolvency.
- Ecopetrol, the supplier of gas to TEBSA and CORELCA, guarantees force majeure payments.

The government's exposure in the CORELCA energy project was estimated at $67 million. In this project, the Ministry of Finance used guarantees and subordinated debt to support a marginally profitable energy distributor (CORELCA) that, in turn, supported the development of a new thermal power plant through a power purchase agreement providing twenty years of capacity payments. Most of the government's exposure originated from the fact that retail energy prices may be insufficient to support CORELCA's operations, causing CORELCA to default.

bility for obtaining the licenses necessary to install new lines and assign operational lines to customers, while Siemens bears the responsibility for installing the lines and switches. However, when the contract was revised early in the project to account for initial delays, Siemens was held harmless for any construction overruns. Thus, it was unclear which construction risks Siemens would actually bear in the future.

The loss variances for each project were also analyzed, and scenario analyses were run to monitor how the risks of each project changed under varying conditions (figure 6.4).

Scenario analysis is an extremely important tool as governments review their exposure to a project finance transaction in the context of more general fiscal policies. In the toll road project, for example, such analysis can reveal the impact of anti-inflationary fiscal policy on the government's exposure to traffic volume guarantees. Scenario analysis is also useful in analyzing alternative approaches to perfecting the government's interest in a particular infrastructure project. For example, along with a Power Purchase Agreement, the Colombian Government took a subordinated interest in CORELCA. As a result, any action that is designed to increase the value of the energy guarantee also must be evaluated based on its impact on the value of the subordinated loan granted to CORELCA.

Risk-Adjusted Performance Measures: A Transition to Budgetary Control of Risks

Once its risk exposure is quantified the government can use the information as a control mechanism by publishing it in the national budget, using it to establish exposure limits or credit limits, or using it to develop risk-adjusted performance measures. Such measures could be used to reward programs that deliver social benefits with the least risk to the public budget. If, for example, two programs yield the same social benefits and the same expected costs, the program with the smaller variability in cash flows should receive more budget funding and be subject to less oversight.

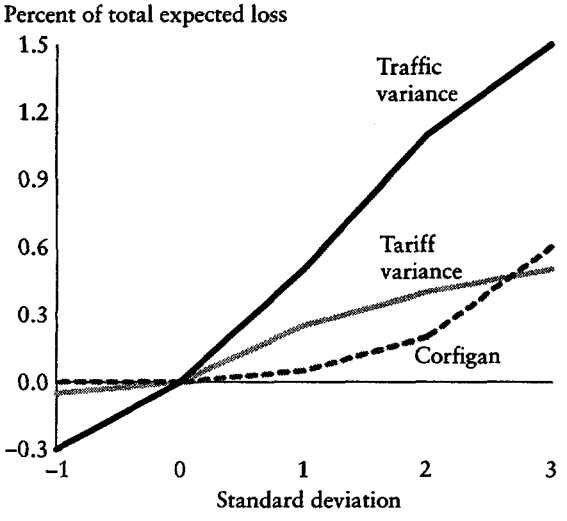
For private companies risk-based performance measures often attempt to measure the return generated by a particular product line relative to the amount of capital that the product line places at risk. That is, companies look at the risk-adjusted return on capital. For national governments the driving mechanism is the budgetary process, and risk management must focus on how the budgetary process can be improved to provide stronger incentives for risk management.

Many governments face significant legal, regulatory, and political hurdles in moving from current budgetary practices to a full accounting of the risks of contingent liabilities. Implementing risk-adjusted performance measures allows governments to manage their exposures to contingent liabilities even if an immediate change in national budgetary policy is not feasible. Nonbudgetary control mechanisms for contingent liabilities could be employed during a transition to a new budgetary system, on a permanent basis for liabilities grandfathered during a change in budgetary policy, or as a permanent management solution if the government failed to enact a change in the budget law. These alternatives include publishing information on government exposures, establishing credit quotas (exposure

TABLE 6.1
Expected government losses in Colombian infrastructure projects
(millions of U.S. dollars)

Type of risk	*El Cortijo–El Vino toll road project*	*Telecom-Siemens joint venture*	*CORELCA energy guarantees*
Market risk	3,100	2,500	52,000
Construction risk	1,100	9,800	0
Counterparty risk	250	100	5,000
Currency risk	0	–1,300	2,000
Force majeure	200	300	7,000
Termination risk	–150	200	1,000
Regulatory risk	0	10,100	0
Total	4,500	21,700	67,000

FIGURE 6.4
Sensitivity analysis for the Colombian toll road project



limits), and earmarking future funds to cover guarantee costs. Similar performance measures can be developed to meet the needs of countries looking to make incremental changes to their budgetary policy or as a mechanism for smoothing the transition to a full budgetary accounting of contingent liabilities.

Budgeting for Expected Costs

Governments need to make risk-return trade-offs when deciding which programs to fund each budget year. While these decisions seek to maximize risk-adjusted social returns rather than financial returns, a clear understanding and accounting for program costs and risks is critical in making these decisions. Unlike private sector corporations few governments set aside budgetary resources to cover the full expected costs of financial guarantee or insurance programs, a far simpler task than establishing reserves to cover unexpected costs. Instead many governments choose to budget only for expected cash outlays associated with a guarantee or insurance program in the next budgetary period.

Present Value versus Cash Budget

Private companies, especially banks and other financial institutions, tend to recognize the present value of expected costs of a product or liability in the year in which the liability is issued, discounting to reflect the time value of money. Private institutions compute virtually all investment decisions, expenditures, plans, and budget forecasts on a present value basis. The use of present value accounting is especially important in areas in which private firms are required to mark-to-market the value of assets or liabilities. But, even where assets and liabilities can be carried at cost, or book value, present value budgeting helps in establishing loss reserves or a capital budget.

In contrast, most government bodies account for credit and insurance products using a simple cash-based system of budgeting. Under a cash-based system of budgeting, a government equates the budgetary cost of issuing financial assistance with the cash outlay created by the transaction in the current budget year. Thus when a government issues a direct loan, the entire face value of the loan at the date the loan is issued is recorded as a budgetary cost, with loan repayments recorded as cash inflows in subsequent years. Simple cash-based budgeting thus treats the disbursement of a direct loan as a grant equal to the entire face value of the loan, with subsequent repayments representing offsetting receipts for the government. Loan guarantee and insurance programs are not recorded as costs in a simple cash-based budget until a claim is made at some future uncertain date. In fact, since any premium revenue from a government insurance program is recorded up front in exchange for the insurance policy, while claims are not recorded until some uncertain date in the future, a simple cash-based budget may record an insurance program as a net revenue gain. This inconsistency creates a budgetary incentive for policymakers to raise premiums rather than reduce the likelihood or severity of claims insured. Cash-based budgeting thus misrepresents and masks the aggregate exposure associated with loan guarantees and government insurance programs and creates perverse incentives for selecting one form of financing assistance over another.

To see how these incentives skew decisionmaking, consider the different ways in which the government could help finance a $100 loan to a private infrastructure provider. If the government provides a 10 percent

loan subsidy, the cash budget cost would be $10 in year one. If, instead, the government provided the loan directly, the cash budgetary cost in year one would be $100—the full face value of the loan. If the government agreed to guarantee a loan made by a private bank, the budgetary cost of the guarantee would be zero (or negative if a guarantee fee is collected) the first year. Thus, while the economic and financial value of the three different forms of financial assistance are equal, a legislative body would favor the guarantee option.

Even more problematic, by not accounting for the budgetary costs of issuing guarantees, a simple cash budget encourages the expansion of guarantee liabilities without requiring the government to reserve against future losses. Without budgetary control these contingent liabilities grow, and the government's exposure to sudden increases in future budgetary costs increases. These unanticipated increases will raise government deficits, require a realignment of budgetary expenditures away from future expectations, and create an enormous political backlash against the government's guarantee programs.

By not aligning the budgetary impact of direct loans, loan guarantees, insurance, and grant programs with their true economic costs at the time commitments are made, a simple cash budget creates an intertemporal myopia and/or moral hazard. Tracking the cost of guarantee claims only as the claims are incurred as opposed to when the commitment was made enables political leaders to provide financial assistance without having to account for the costs of providing the assistance, which will be realized under ensuing administrations. This form of myopia can quickly lead to an escalation in guarantee costs as ensuing administrations increase their financial assistance to favored parties. Only by enforcing budgetary controls at the time the financial assistance is committed can the appropriate budgetary incentives be realigned to eliminate this moral hazard.

Use of a present value system need not affect or distort cash-based estimates of the government's fiscal deficit, since the effect on the deficit is not recorded until actual cash payments are disbursed from the reserve fund. Adoption of a present value method of guarantee budgeting simply forces agencies to set aside reserves up front for the expected costs of the guarantee issued.

Appropriate Discount Rate

To discount nominal cash flow streams to compute the present value of expected losses, private companies typically follow one of two procedures. Under one approach projected cash flows are discounted using a risk-adjusted discount rate based on the firm's cost of capital. (For more on industry cost-of-capital estimates see Fama and French 1997.) Under a second approach risk-adjusted cash flows are discounted using a risk-free rate of interest, usually proxied by the short-term U.S. Treasury bill rate, LIBOR, or overnight interest rates.

In computing a government's exposure to credit and insurance programs using contingent claims analysis, the second approach is used, and no consideration of the appropriate risk-adjusted discount rate is needed. In cases in which cash flows do need to be discounted by a risk-adjusted interest rate, the government must determine the appropriate discount rate policy. In the United States, the government uses its cost of funds as the discounting factor (as reflected by the U.S. Treasury rate with the same maturity as the loan guarantee or direct loan).[3] The alternative approach considered in the United States was a "benefit-to-borrow" approach, in which the discount factors would be computed from the discount rates used by private sector agents when computing the benefits of the government program. The problem with a risk-adjusted discounted rate approach, especially for contracts with embedded options, is that the appropriate discount rate becomes a function of the riskiness of the contract payouts.

The Federal Credit Reform Act of 1990

Prompted by the explosion of loan guarantees issued during the 1980s and a recognition of biases created by a simple cash-based system of budgeting, the United States changed the budgetary treatment of direct loans, loan guarantees, and grants in 1992.[4] Under the new budgeting system created by the Federal Credit Reform Act of 1990, each of these

forms of credit was valued using a financially equivalent metric—the expected present value of future costs. The budgetary cost of credit is defined as the present value, discounted at Treasury interest rates of comparable maturity, of the expected cash outflows from the government minus the expected cash inflows to the government.[5] The shortfall between borrower fees, repayments, and interest and the amount needed to cover the principal of the loan and the Treasury's cost of borrowing represents a cost to the government. Likewise the difference between the fees borrowers pay to the government and the cost of guaranteed loan defaults (and/or interest subsidies) represents a cost. When agencies seek budget resources (budget authority and budget appropriations) to carry out a credit program in the budget process, they must estimate and request the full expected present value of future costs—including default, interest, and other costs—associated with loan guarantees or direct loans to be issued in the forthcoming budget year. Funding to cover the expected present value of future costs is charged against the appropriation for an agency when the direct loan or loan guarantee is issued and the government's commitment is extended. These costs, or subsidies, must compete for budgetary resources on the same basis as other government spending.

Credit reform requires more careful record keeping than a simple cash budget. Agencies must identify loans or classes of loans by the appropriation used to fund the transaction, their maturity and date of origination, and their subsequent cash outflows and inflows. In addition, programs are required to develop risk categories based on the characteristics that determine the likelihood of default and other costs. These records are used to reestimate the value of the subsidies provided for loans or loan guarantees, adjust ex post budgetary expenditures relative to ex ante expectations, and improve the subsidy calculations for new loans or guarantees. This tracking also helps agencies underwrite, service, and control losses on loans or guarantees.

The Federal Credit Reform Act significantly improved the budgeting process in the United States. By revealing the true fiscal implications of direct loans, guarantees, and grants, the new budgeting system allows policymakers to make decisions on the form of financial support on the basis of the underlying needs of the targeted population rather than on the specific budgetary treatment of alternative financial structures.

The Federal Credit Reform Act does have shortcomings, which provide useful guidance for future budgetary reforms in the United States and elsewhere. First, coverage of unexpected losses is not included as part of the cost of a program. This failure to incorporate some measure of unexpected loss represents a serious shortcoming given that most loss distributions associated with central government guarantees are asymmetrically skewed against the government. Second, incentives remain to use "cheap" insurance structures to cover loan guarantees. Government insurance programs are financially equivalent to guarantee programs and should be treated in a consistent budgetary framework. Third, program agencies must make substantial investments in new information systems technology. In the United States, new investment in information systems placed a strain on many of these agencies. Governments adopting credit reform must recognize at the outset that funds need to be available for this investment. Finally, credit reform requires that agencies reestimate the subsidy costs of their programs on a regular basis so that the government's exposure can be recalculated and appropriate funding is set aside to cover future costs. Appropriate discipline is required to ensure that agencies do not underestimate subsidy costs with the knowledge that any shortfall will be made up in someone else's watch.

Learning from the experience in the United States, New Zealand has implemented a similar budgeting approach. Their program covers all contingent liability exposures (including insurance), and the government has published a present value budget for both contingent and noncontingent expenditure and revenue flows.

Risk Preferences and Reserve Policy

In addition to budgeting for the full expected present value of costs from credit and insurance programs, governments need to set aside reserves against unexpected losses. Preparing for unexpected losses prevents the

political backlash associated with redirecting scarce public resources to cover the sudden increase in costs, obviates the need for political battles over additional funding, and eliminates the perception that any sudden increase in costs represents program mismanagement.

Setting up reserves to protect against such events can mitigate these problems by reducing the number of events for which the executive branch or administering agency needs to seek additional budgetary resources to cover program costs and by reducing the size of any budgetary requests that are made. Because the United States government did not reserve against unexpected losses, it incurred high political costs as a result of the $130 billion in losses charged to U.S. taxpayers during the thrift crisis of the 1980s.

When a private corporation examines its exposure to risk, its management committee must determine the amount of capital and reserves that the company wishes to hold in excess of expected costs to cover unexpected losses. For an institution with multiple lines of business, determining the appropriate level of capital or reserves is a complex procedure that takes into account both the variability of losses for each product line and the correlation between product returns and the opportunity cost of capital. Management must also weigh the expectations of the company's shareholders and stakeholders, rating agencies, and its business partners in determining an optimal level of capital for maximizing shareholder value. The level of capital or reserves held by an enterprise reflects its relative risk aversion and its ability to withstand a specific level of unexpected losses. Thus a firm seeking a AAA rating will hold considerably more capital against unexpected losses (say, capital to cover a 99 percentile event over a 1-year period) than a firm seeking an A rating (capital to cover a 90 percentile event).

Determining the Aversion to Unexpected Losses

Setting aside reserves for unexpected losses reduces the frequency with which the executive branch needs to go to the legislature for special appropriations or a special incomes bill. If the government wants to go to the legislature only once every thirty years for a given guarantee, it needs to find the level of loss protection that will allow it to do so. Once the proper valuation tools are in place the government can set reserve policy based on an assessment of its aversion to making frequent requests for funding to the legislature.

Distributions of potential guarantee payouts are complex. Rather than specifying a probability threshold in terms of the probability of default, which would be unwieldy, common practice is to describe it in terms of the standard deviation of losses. Depending on the type of distribution, deciding on the appropriate multiple of the standard deviation as the threshold will result in a particular default frequency.[6] Many companies set capital and reserves to cover a two or three standard deviation movement in their underlying risks.

Another important factor in determining the level of reserves is the government's leverage preferences, that is, the opportunity cost of holding funds in reserve as opposed to spending the resources on programs. On the one hand, holding more funds in reserve will increase the liquidity of the guarantees that the reserve supports, increasing the value of the guarantee and allowing the government to leverage more private sector funding in the guarantee program. On the other hand, reserving funds in a separate account reduces the amount of money available for other public sector projects. If the net benefits of additional public spending exceed the liquidity benefits of adding to the guarantee reserve, the government may want to direct additional funds toward public spending.

When a private company assesses this trade-off between holding reserves or investing in other programs, it usually has a targeted economic return that helps guide its capital policy. For a government the comparable concept is social economic return. Calculating social economic return requires a complete asset-liability management program that goes beyond the valuation of infrastructure liabilities or other forms of direct loans, loan guarantees, and insurance. This chapter focuses solely on reserving against contingent liabilities without considering a broader asset-liability management policy.

Establishing a Reserves Policy

Once a government can assess its risk tolerances and goals, in terms of both which risks and the level of loss

it is willing to bear, it can establish reserves against unexpected losses ("risk capital") within its credit and insurance programs.[7] To do so, however, a government needs to determine whether reserves will be set based on the additive unexpected loss exposure of each guarantee or on a portfolio value-at-risk approach to account for portfolio diversification, what the investment policy of the reserves will be once they are established, and where the reserves should reside.

Additive versus Portfolio Reserve Requirements. The first decision that a government needs to consider when setting up a reserve for unexpected losses is the measure of unexpected loss against which to capitalize. Under an additive reserve standard the government calculates the unexpected loss exposure of each of its contingent liabilities (that is, examines the sensitivity of each guarantee valuation to changes in the underlying factors) independently. Then for a given confidence level and time interval it determines the amount of unexpected loss it wishes to cover for each guarantee, taking into consideration the opportunity cost of capital. The government then identifies the average cash reserve required to fund these unexpected losses. Finally, the individual cash reserve balances are aggregated to arrive at a total unexpected loss reserve. This additive approach for setting capital or unexpected reserves is supported by bank regulatory capital standards for financial institutions.

The problem with the additive approach for setting unexpected loss reserves is that it fails to account for portfolio diversification—the fact that pooling imperfectly correlated risks will reduce the variance in the expected loss of a portfolio. As a result the risk of the overall portfolio will be overstated, and more protection against unexpected losses would be provided than originally sought by the government (Merton and Perold 1993). The alternative is to calculate the aggregate loss distribution of the government's portfolio of risks, using a value-at-risk approach that incorporates cross correlations between guarantee exposures and then set reserves to cover unexpected losses based on the unexpected loss profile of the whole portfolio.

Value-at-Risk Methodologies. The sensitivity of the value of a portfolio to changes in underlying market factors and the joint probability distributions of changes in the underlying market factors affect the level of risk capital in a portfolio of risks. Examining these two elements allows the maximum possible loss within a known confidence interval to be determined over a given time horizon known as the portfolio's Value-at-Risk (VaR). For private financial institutions a variety of approaches are used to calculate portfolio VaRs. The most widely referenced, although not the best, model is the RiskMetrics™ model, published by J. P. Morgan (1996).[8]

Specifying the position sensitivities and the underlying variance-covariance matrix of market rate innovations is a nontrivial exercise and requires a number of simplifying assumptions even for actively traded securities. For example, portfolio-normal VaR approaches assume that portfolio returns are normally distributed. RiskMetrics™ and Delta-Normal approaches assume that asset returns are jointly normally distributed, implying linear asset payoff profiles and normally distributed portfolio returns. Delta-Gamma methods assume that innovations in market rates are normal, but that payoff profiles are approximated by local, second-order terms (Wilson 1997). Many of the criticisms of VaR models deal with the reasonableness of these simplifying assumptions for a given application as opposed to the underlying approach. Wilson (1997) and Duffie and Pan (1997) provide a good summary of the advantages, disadvantages, and common critiques of different VaR methodologies.

Value-at-Risk for a portfolio of infrastructure liabilities. Government infrastructure guarantees can be analyzed as contingent claims, and a VaR model can be applied to government infrastructure liabilities. The shortcoming of most VaR approaches, including RiskMetrics™, in evaluating the risks associated with a portfolio of options is their failure to reflect the nonlinear payoff functions of options. Most of these approaches would thus not be suitable for calculating the VaR associated with a portfolio of infrastructure liabilities.

One VaR approach that attempts to incorporate the nonlinearity in options portfolios is the Delta-Gamma approach (Wilson 1997). Unlike Delta-Normal

approaches such as RiskMetrics™, the Delta-Gamma approach uses a second-order Taylor series approximation of a portfolio's value function around current market rates to incorporate direct and cross-market convexity risk (the rate of change in the value of an instrument given an incremental change in the underlying asset's price) and vega risk (the change in the value of an instrument given an incremental change in the underlying asset's volatility). Convexity and vega risk represent two of the more important risk factors in a portfolio of options. Assuming that market rate innovations have a joint normal distribution, the Delta-Gamma approach solves for the VaR in a portfolio of options by searching for the market rate events that result in the worst VaR within a given confidence interval. As such the approach can be a useful tool for banks computing the VaR of an options portfolio over short periods of time.

The approach is less useful for analyzing the VaR of government guarantees over longer time intervals, since it analyzes only how local changes in the underlying market rate factors affect the value of an options portfolio. This approach may be reasonable for computing the one-day or two-week VaR of a financial options portfolio. It is considerably less useful for examining the unexpected loss exposure of infrastructure liabilities over many years.

A powerful alternative VaR approach that can provide a more accurate depiction of the government's longer-term risk exposure is using contingent claims analysis in concert with stochastic simulation and scenario analysis. Given an accurate contingent claims model and the "true" specification of the process governing changes in the price of the underlying asset, Monte Carlo analysis can be used to examine the sensitivities of infrastructure liability exposures to small and large movements in the underlying risk factors. Monte Carlo simulation is not commonly used by financial institutions because of the massive computing resources required to evaluate a large portfolio of financial options. In analyzing infrastructure liabilities, however, where the number of government guarantees outstanding in any one portfolio is more limited, Monte Carlo simulation techniques can be very effective. The combination of contingent claims pricing and Monte Carlo simulation allows a richer array of policy variables to be analyzed to assess the impact of different policy actions on the value of an existing guarantee or infrastructure liability program.

Investing reserves. One important issue in structuring reserves for unexpected loss is the investment policy of the reserve fund. Should the reserves be invested in government debt securities, corporate debt, equities, or some combination? This issue has been hotly debated in the United States, where government agencies typically to invest all reserve fund assets in U.S. Treasury securities. Recently, many federal agencies have asked to be allowed to invest a portion of their reserve funds in the stock market, arguing that investing in the stock market would allow them to accumulate larger reserves.

One serious problem with investing reserves in the stock market is that funds may not be available when needed to cover losses. Consider, for example, a reserve fund established to pay for unexpected losses on government guarantees against interruptions in housing construction that is invested in S&P 500 stocks. Given its sensitivity to interest rate movements, construction activity is very cyclical, falling sharply during economic downturns. As construction activity falls construction company earnings drop, increasing the probability of a company failure and a major interruption in construction activity for projects supported by a government guarantee. The performance of the construction industry is also highly correlated with the S&P 500 (the industry beta is about 1.25). Therefore, if the probability of a call on the government's construction guarantee rises, the value of reserve funds invested in the S&P 500 will fall, decreasing the value of the reserves. The more severe the economic downturn, the more likely the government's guarantee will be exercised and the more likely that the value of the reserve funds invested in equities will be insufficient to cover unexpected losses. In this example investing the reserve funds in equities actually decreases the value of those reserves compared with investing in short-term government securities.

The objective in investing the reserve fund should be to maximize the value of the assets in the fund when the costs to the government increase—that is, to invest the reserve funds in assets that provide the best hedge

against the government's cost for a given return. Investing the reserve fund in assets whose value is negatively correlated with the value of the guarantee requires very active asset management strategies, however. The government may be better served by managing its assets and liabilities at the balance sheet level rather than on a per program basis. To do so, the government would invest all reserve fund assets in government securities with the same durations the loan guarantee, direct loan, or insurance programs for which the reserve is established. The government could then hedge its net balance sheet position with investments that limit its exposure to those macroeconomic risks that the government deems consistent with public policy. Of course, investing in government securities in this manner is equivalent to reducing the government's gross debt position, implying the need to examine reserves policy as a governmentwide asset-liability issue.

Investing construction guarantees reserve fund assets in government securities would provide a hedge for the government, since rising interest rates would cause the value of the construction guarantees (and costs) to rise and the price of government securities to fall. The government may thus find it advantageous to fund any guarantee costs by issuing new cheaper debt instruments—in effect, substituting for the securities in the reserve fund. If all of the government's guarantees are in an external currency, the government then could purchase currency forward to hedge against its net currency exposure.

The government also needs to decide if it will hold its offshore in a foreign currency or domestically in the domestic currency. In the case of project finance guarantees the same logic that applied to the investment policy of reserves applies to the management of foreign exchange risk. If the project finance guarantees are denominated in dollars, the government should consider investing the reserve fund in dollar assets and possibly keeping the reserve offshore to circumvent convertibility risk issues. This policy would greatly enhance the market's value of the guarantee and provide the government with greater leverage from the guarantee program. However, any decision on the location of the reserves must be made in the context of the government's broader foreign currency risk management program.

Complementary Measures for Reducing Risk

Designing clear contracts, introducing incentives to reduce the incidence of calls on guarantees, and regularly monitoring performance under the guarantee contracts can limit the government's exposure to risk.

Designing Appropriate Contracts

A comprehensive risk management system forces agents to critically assess the distribution of risks within a particular direct loan, guarantee, or insurance program (box 6.4). The recent debate over the provision of catastrophic disaster assistance in the United States highlights the importance of a comprehensive risk management system. Over the past five years insurance companies in the United States have recognized that they are overexposed with respect to property damage from natural disasters. Recognition of this overexposure led to many early legislative initiatives by the insurance industry calling for the federal government to provide direct insurance or reinsurance for disaster coverage. As the debate over the government's role in disaster risk evolved and the issue was more narrowly defined as an incomplete market in the intertemporal smoothing of large idiosyncratic risks, however, the U.S. government recognized that providing a mechanism for financing only the higher layers of disaster losses provided a more targeted and efficient solution (Lewis and Murdock 1996).

The process of comprehensive risk management also forces a government agency to ensure that any guarantee or assistance has clearly defined terms that are aligned with the agency's management objectives. The contracts in the Colombian Telecom joint venture allocate construction risks clearly. However, when the contract was restructured after an initial construction delay in the project, Telecom assumed all of the costs—leaving Siemens with the same net present value benefits as in the original contract. Management of the contract sent a signal to Siemens that Telecom will bear a larger portion of the construction risks than envisioned in the original contracts.

When the management of government assistance deviates from the terms of the assistance being provided, the government is perceived to provide an implicit

guarantee. Although an implicit guarantee does not contractually obligate the government to provide assistance, where the public believes the government will step in to provide assistance when needed an implicit guarantee becomes explicit. Examples of implicit guarantees abound, including the "too-big-to-fail" and 100 percent depositor protection concepts for deposit insurance in the United States and federal support of government sponsored agencies in most countries.

Faced with implicit guarantees the government should either make the guarantee explicit and manage the guarantee as an assumed risk or explicitly deny any obligation and willingness to provide assistance when needed. By doing neither the government reinforces the perception that an implicit guarantee will be honored and increases the political pressure to support the provision of government assistance in the event that support is needed, while maintaining no control over the management of this conditional exposure. (For more on implicit guarantees see Kane 1996).

The government must first assess which party (public or private) has the best access to information needed to objectively and most accurately assess the riskiness of the underlying risks. The government must then assess which party is in the best position to monitor, control, and service the risks once they are underwritten. If the government is in the best position to underwrite the risks directly, direct credit should be considered, with credit assistance targeted to the area of concern. The government should then determine whether it also has the information and skills to most effectively monitor and control the risks or whether a private servicer should be employed to service the loans. Where the government delegates servicing, it must have the systems for monitoring the performance of the servicers.

Even if the government has the best access to information on a particular risk, it may choose to provide assistance in the form of a guarantee targeted at a specific layer instead of providing direct credit, since a contingent guarantee can be more narrowly focused at the market failure. In the Colombian toll road, for example, instead of providing direct financing for the toll road construction, the government purchased the engineering specifications (a public good provided free) and then provided a more narrowly defined guarantee, thereby obtaining a more targeted structure. Because guarantees and insurance can be narrowly targeted they can be used to get the private sector to absorb as much risk as possible.

Where the private sector is better able to underwrite and service the underlying risks but some government assistance is needed, public-private risk-sharing is often the best solution. In this case pro rata guarantees and insurance in which the private sector and the government share all losses on a particular risk equally are often the best form of assistance, since the firm shares an equal percentage of the losses across all types of risk. Risk-sharing provides the private entity with an incentive to price the coverage appropriately, ensuring the government that the private sector will not shift additional risks to the taxpayer.

Other risk-sharing mechanisms within and between classes of risk are also feasible. However, they usually require more government oversight and more government underwriting expertise.

BOX 6.4

Improving risk management on the Colombia toll road project

In soliciting bids for the Colombia toll road project the government asked prospective concessionaires to bid on construction projects based on only a preliminary set of engineering designs. Recognizing that these designs provided insufficient detail, the government granted cost overrun guarantees that would compensate the concessionaire for cost variances within a wide band around the submitted bid. While the guarantee served the purpose of attracting qualified bidders, the structure of the guarantee allowed the concessionaire to extract a near certain rent from the government of about 35 percent of the original bid costs.

After critically assessing the risk transfer associated with these toll road projects and quantifying the risks in the El Cortijo–El Vino project, the Colombian government changed its toll road guarantee program. The government now commissions more detailed engineering studies before it solicits bids to limit the uncertainty inherent in the bidding process and provides a narrow guarantee. The new policy was less expensive than the old one but provided the same benefit to the concessionaire. The change made the Colombian toll road project more efficient—delivering a higher risk-adjusted rate of return by reducing the government's risk of delivering a fixed benefit.

The tools and techniques associated with risk management are also helpful in analyzing the structure of government programs that share responsibilities between the federal and state level. In the United States, for example, several programs combine the national government's ability to redistribute resources across economically diverse regions with the ability of state and local governments to identify investment needs at the local level. The national government funds the program, while state and local government provide the underwriting and administrative function. This federal-state partnership is a potentially powerful combination that is analogous to a parent company providing a guaranteed source of financing to a subsidiary established to perform a particular service.

Such federal-state partnerships are not without risks, however. If the federal government providing the funds does not retain oversight of the underwriting function, the national budget remains at risk. But if the federal government is overly prescriptive in setting regulations for the program, the flexibility of the state and local entity to identify specific needs in the local community is reduced. The goal is to reach the optimal trade-off between the delegation of project selection and federal oversight of the underwriting performance of the state facility (box 6.5).

Minimizing the Frequency and Financial Impact of Calls on Guarantees

Governments need to implement strong risk management programs to limit their contingent liability exposure to additional loss shifting by the guaranteed party. Mitigation actions attempt both to reduce the frequency of the government's losses and to minimize the financial impact of those guaranteed events that do occur. Risk controls attempt to minimize the ability of the guaranteed party to shift additional risk to the government (through moral hazard, adverse selection, and other forms of distribution shifting).

Governments can reduce their contingent liability exposure to risk in many ways. They can require the guaranteed party to hold a certain amount of capital or collateral to serve as a first-loss protection barrier for the project, thereby aligning the guaranteed party's incentives to remain vested in the project with the government. They can place restrictions on the use and investment policy of reserves that are held by the guaranteed party to ensure that the value of the reserves is unimpaired during periods in which a loss event is likely. They can structure the government's support to promote pro rata risk-sharing, where a private party shares risk equally with the government for some, or all, types of loss. Since the private party in this transaction bears the same risk per dollar of exposure as the government, public-private risk-sharing allows the government to benefit from the private sector's pricing of risks. Finally, the government can levy risk-based guarantee fees that both reduce the budgetary cost of issuing guarantees and improve the alignment of incentives between the guaranteed party and the central government. (Fees can be estimated using the techniques identified earlier, including contingent claims techniques.)

Limiting the ability of private agents to shift additional losses to the government reduces the budgetary costs of issuing guarantees and enhances the allocation of scarce budgetary resources by limiting rent-seeking behavior.

Monitoring Performance and Reestimating Risks

Once the government has implemented budgetary and reserves systems for its contingent liabilities and decided which risks it chooses to cover, it should communicate these decisions and risk management guidelines to the agencies responsible for implementing the guarantee programs. The government should evaluate the performance of agency personnel based on their ability to meet these goals. In this way the government can obtain a proper alignment between government risk management objectives and the performance of the agencies administering the programs.

To be effective comprehensive risk management system must implement systems for monitoring the changing risk exposure of its portfolio. As experience has shown, techniques for assessing risk are only as good as the information on which the models are based. Over time institutions change, markets evolve, and new information on risk exposures is obtained. In many instances risks that were previously unknown or unquantifiable are revealed through a series of loss

BOX 6.5

Revitalizing urban areas through federal-state partnerships in the United States

Under the Community Development Block Grant (CDBG) program in the United States, states and local communities receive federal grants to help finance community development projects designed to transform abandoned urban neighborhoods into viable local communities for mixed-income households. The program also provides grants to support the financing of capital projects designed to create new centers of economic activity in areas that have become economically depressed. Opportunities for investment are selected by the state and local community and are financed with the federal grants.

The CDBG program is an important part of the effort to revitalize urban centers in the United States. State and local communities were often unable to use the CDGB program, however, because investments in local community revitalization required a large up-front infusion of funds, not a gradual annuity in block grant funding. To address this concern the U.S. Congress enacted the Section 108 Community Development Block Grant Loan Guarantee Program, which provides federal loan guarantees on development loans obtained by the state and local communities for economic development. The program has enabled state and local governments access to up-front financing for their development projects.

The federal government used two risk mitigation techniques. First, it collateralized the loan guarantees with a state's ability to receive future block grant funds. If a state triggered the federal guarantee by defaulting on a loan, the state would lose access to all future block grant funds until the loss on the loan was repaid by the federal government using that state's future block grant money. The federal government also established strict criteria, based on project underwriting performance, for which states and local communities could participate in the loan guarantee program. These oversight functions were seen as critical to the success of the overall program.

The CDBG program has its shortcomings. Since the funds are not an entitlement, collateralizing the loan guarantee against a discretionary source of Congressional funding provides a very limited form of collateralization. Nevertheless, the program provides a good illustration of the power of federal-state partnerships, the problems faced in structuring a federal-state risk-sharing agreement, and the risk management tools needed to assess the risks of each entity's exposure.

events, leading to radical changes in risk assessment. The governments thus need to have a systematic approach for quickly incorporating new information on its changing risk exposures into its pricing of new contingent liabilities and for making adjustments to the expected costs of previously issued liabilities (reestimates). Development of these systems improves the government's accounting of expected loss and limits opportunities for moral hazard, adverse selection, and other means of shifting additional risk to the central government.

To comply with the tracking requirements mandated by the Federal Credit Reform Act, government agencies in the United States were forced to update their outdated budget and accounting systems. This improvement in information processing and tracking systems led to a substantial increase in both the quantity and quality of information available on government programs—information that policymakers have used to guide future reforms or program development. Although the costs associated with implementing new risk management systems were significant, the benefits associated with better risk processing systems are believed to have exceeded the costs. The Federal Credit Reform Act also required agencies to implement systems for computing reestimates on a timely basis as part of the overall budget process. Under this system federal agencies are supposed to reassess the expected costs of each year's activity in their credit programs at regular intervals and use this information to alter the expected costs for newly issued direct loans or guarantees.[9] Furthermore, if the change in the expected costs of previously issued direct loans or guarantees is significant (that is, it deviates from prior estimates by more than 5 percent), the agency is required to seek additional budgetary resources to fund the additional exposure. Similar systems can be implemented in other central governments for all forms of contingent liabilities.

Conclusion

The explosion of infrastructure liabilities has created the need for risk management techniques with which to manage governments' exposure to contingent liabilities. Because guarantees involve no immediate cost to the government, they do not appear in the govern-

ment accounts, and funds are not budgeted to cover them. This failure to account for guarantees leaves governments vulnerable to large unexpected demands on their resources. It also skews government decision-making in favor of guarantees over subsidies, since guarantees require no legislative approval and funding.

Quantifying the value of guarantees using enterprise risk management techniques can help governments reduce risk, improve project and contract design, and reduce the incentive to offer guarantees rather than subsidies. Moreover, by budgeting for expected losses and setting aside reserves against unexpected losses, governments can avoid potentially serious fiscal problems and the political backlash that occurs when contingent liabilities come due.

By implementing an economywide risk management system, governments can manage risk from all sources of revenue and expenditures as part of a broader risk management strategy. Adopting such a system will provide governments with a valuable tool with which to better allocate scarce resources and risk within the economy.

Notes

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1. The risk-adjusted rate of return represents the difference between the rate of return earned on an investment and the risk-free rate of interest less the market's premium for bearing the risks associated with the investment.

2. For example, the general formula for an insurance policy, which we demonstrate below as equivalent to a combination of guarantees or options, can be expressed as follows (Patrick 1990):

$$Premium = \frac{f(Expected\ Loss\ Distribution)}{(1 - EL)(1 - r)}$$

where EL is the insurer's expense loading—enabling it to cover its administrative costs—and r is the targeted economic rate of return. The term f(.) prices the risk of the insured portfolio based on the expected loss distribution. At a minimum, f(.) incorporates the mean expected loss and the variance of the expected claims distribution. However, a more accurate approach also would incorporate higher moments of the loss distribution since the actual loss distribution associated with many risks are not asymmetrically distributed around the expected value (or mean). Note, this approach is comparable to a discounted cash flow analysis, where r is the risk-free rate of interest.

3. Technically, a more appropriate implementation of this concept would use the Treasury rate with a maturity comparable to the duration of the federal guarantee or direct loan.

4. The Federal Credit Reform Act did not change the budgetary treatment of insurance programs, creating a clear inconsistency in the U.S. budget. However, the Office of Management and Budget in the Executive Branch has endorsed budgetary reforms designed to end this anomaly and the Congressional Budget Office, the General Accounting Office, and the Congressional Research Service have all acknowledged that putting insurance programs on a consistent basis is the next major budgetary reform.

5. Note, by using the Government's cost-of-funds to discount expected future costs, the United States creates a disconnect between the budgetary costs of a program and the costs that should be estimated as part of any benefit-cost analysis justifying the program, which would be estimated using a (higher) private sector discount rate.

6. For a normal distribution, which is the most likely distribution for the overall portfolio exposure, the relationship between variance and expected distribution function is well known.

7. While we limit our discussion on the establishment of reserves to all credit and insurance programs, given the focus on infrastructure liabilities, the principles discussed here apply more broadly to all government risks.

8. As an illustration, J. P. Morgan's RiskMetrics™ VaR formula can be expressed as follows:

$$VaR = \rho\sqrt{\omega'\Sigma\omega}\sqrt{\Delta t}.$$

where ρ is a constant representing the desired one-tail confidence interval for the standard normal distribution, Σ is the N x N annualized covariance matrix of security (or guarantee) returns, ω is the N x 1 vector of portfolio position weights, and Δt (or τ) is the time interval expressed as a fraction of a year (J.P. Morgan 1996).

9. Guidance provided by the Office of Management and Budget has indicated that regular intervals should translate to every year for the first five years of a program

and then every fifth year after year five or when there has been an identifiable material change to the risk exposure of the program.

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Comments on "The Management of Contingent Liabilities"

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Mody and Lewis present a useful approach to the management of contingent liabilities. Their proposed methodology shows how to identify and value contingent liabilities and outlines procedures on how to incorporate their costs to government, with special emphasis on budgetary aspects. This methodology and these procedures need to be formalized and institutionalized to ensure their sustainability over time. The Colombian case provides a good example in several areas.

The role of a good regulatory framework in making guarantees unnecessary is well recognized. Good project and contract design can also help reach this goal. If guarantees are necessary, however, it is important to have a public institution or entity entrusted with establishing policies on guarantees. In particular, this entity needs to define guidelines on the distribution of risks by sector between the government and private firms. It also needs to unify criteria across sectors and across the various levels of government. In Colombia a commission comprising the Finance and Planning Ministries plays this role. The commission is championing a law that requires public institutions, especially at the municipal level, to formally record important obligations, to value the guarantees, and to reserve against the contingent liability. The law also envisages the creation of a national fund for this purpose.

The lack of historical data on the occurrence of events that are being guaranteed against limits the usefulness of actuarial or econometric methods for measuring risks and expected losses. The Colombian government finds it more useful to use a model based on contingent claims theory and Monte Carlo simulations. This allows projections to be made based on multiple scenarios with different probabilities in order to determine the probability of bad states of the world. The government is trying to make the model more user friendly. Better measurement of losses and the probability of their occurrence will improve the structure and coverage of guarantees.

Fiscal discipline in the use of guarantees is a top priority of the Colombian government. However, the proposal to provision for guarantees and to establish a fund is not always politically or financially feasible. For this reason the government is exploring other complementary ways to provide discipline. First, a recent law establishes limits on the ratio of interest payments to current savings (60 percent) and on the ratio of debt stock to current income (80 percent) for all public entities. This obliges the entities to reflect the impact of guarantees. It can also be used in conjunction with the proposed guarantee fund, thereby ameliorating its impact on the entity's cash flow position. Second, where it is not possible to provision for guarantees at the time they are given, future obligations should be programmed and budgeted at least one year in advance. Third, guarantees should be clearly accounted for. An interesting alternative to the guarantee fund, at

least from a liquidity point of view, is the standby credits of the World Bank, which are being proposed in the Tobiagrande-Puerto Salgar toll road.

A sovereign asset-liability management system can help ensure debt sustainability as part of an economic development strategy. Such a system allows integrated treatment of the risks associated with both explicit and contingent liabilities within an economic framework, and can be implemented without moving to the ambitious schemes of Australia and New Zealand, where balance sheets and statements of profit and loss are produced. The systems used in Ireland and Belgium, which provide an institutional framework for the modern and efficient management of risk, may prove more fruitful. The Colombian government, with the help of the World Bank, is developing such a system. Although the process is slow, it should help reduce the abuses of the current system and gradually be adopted at all levels of the public sector. It is crucial to create a culture of risk awareness in government, in which the potential impact of risk is recognized. Doing so will create incentives to rationalize, value, control, and manage risks in an integrated way, which will require a significant investment in human capital.

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As Lewis and Mody note, the risks that many governments assume in order to attract private investment in infrastructure can by quantified, introduced into the budgeting process, and reserved against. Where this is done, projects will be pursued only when both social and private ex ante rates of return are positive, and the risk of large adverse shocks to the budgets and economies can be minimized.

Few would dispute that governments need better ways to account for the contingent liabilities they undertake, and few would take issue with the theoretical approach outlined by Lewis and Mody. The problem is how to implement the theory in practice, when information on probability distributions, price variances, and contingent state outcomes is sparse. While Lewis and Mody show in their examples from Colombia that it is possible to value real guarantees, it is not clear exactly how the estimates were arrived at or how robust they are. This may give a false air of specificity to the analysis. While governments need to recognize that contingent liabilities are capable of analysis they should also be aware that these analyses themselves are subject to uncertainties and can require expensive and time-consuming but nevertheless inexact estimates.

In outlining guidelines for incorporating contingent liabilities into the government budgeting process, the authors show that cash budgeting leads to significant distortions in government liabilities and to biases in the types of government support used. The temptation for governments to provide guarantees without budgeting for their costs is apparent. But Lewis and Mody go beyond this point to recommend establishing reserves for unexpected losses in the same fashion as a risk-taking corporation. This may not be feasible. Governments may find it impossible to self-insure against catastrophic losses, or they may find that the backlash by voters, foreign capital providers, and credit rating companies may be unacceptably high.

Another strength of the paper is that it suggests ways in which a risk management system can improve contract design and project management. By undertaking careful studies of the risks associated with the toll road project before the bidding, the government of Colombia reduced risks for both the private and public sector. Conducting an analysis of risk will ensure that governments understand the risks they are taking on. Even implicit government guarantees, which arise in the case of large banks, large construction firms, and politically sensitive projects, can also prove costly, as both the government and the private sector may be uncertain of the government's support.

Lewis and Mody have shown that both implicit and explicit liabilities can be appropriately priced, budgeted for, and managed. If they could also show that risk management can be done reliably, quickly, and comprehensively, the prospects for improved infrastructure finance would be markedly improved.

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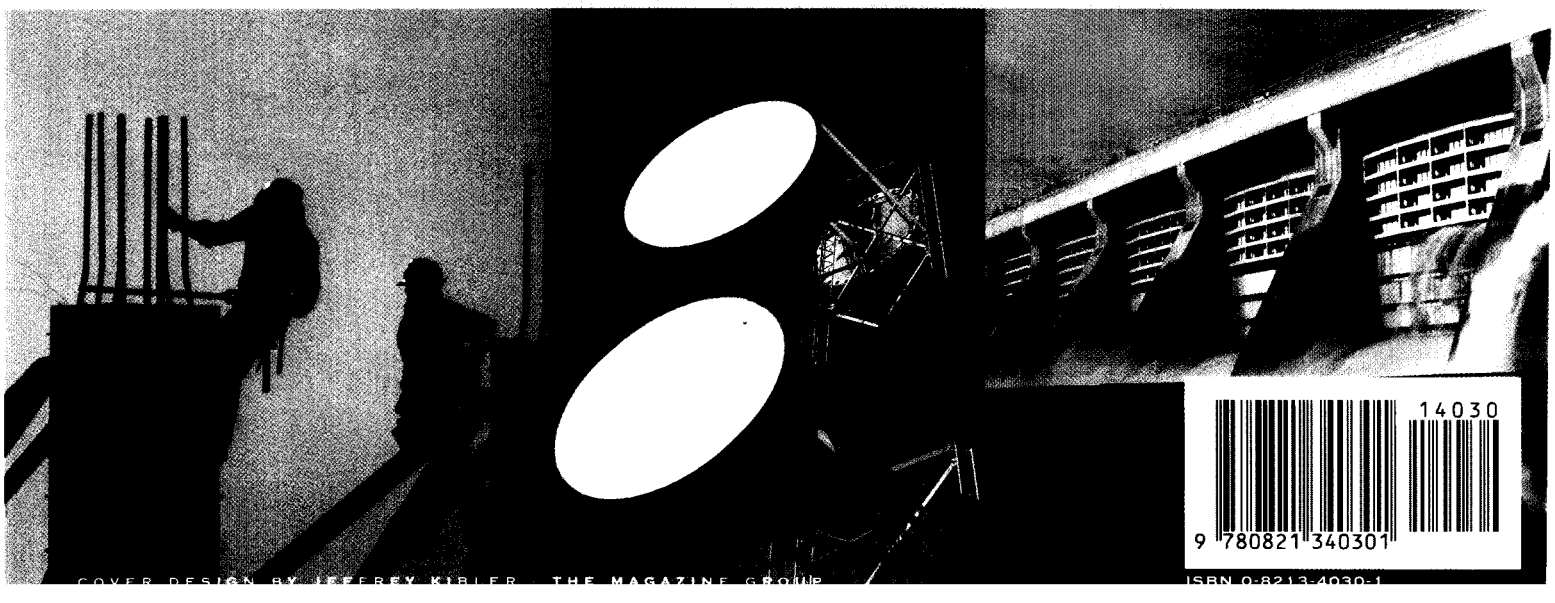

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