Contingent Liabilities for Infrastructure Projects

Implementing a risk management framework for governments

To manage their exposure arising from guarantees to infrastructure projects, governments need to adopt modern risk management techniques. Because guarantees come due only if particular events occur and involve no immediate cost to the government, they rarely appear in the government accounts or have funds budgeted to cover them. This Note introduces an integrated risk management system that draws on recent advances in the private sector. The system, adapted for use in the public sector, enables governments to budget for expected losses and to set aside reserves against unexpected losses, thus avoiding the budgetary stress associated with redirecting scarce public resources to cover a sudden increase in costs.

Over the past several years many large multinational firms, including Bankers Trust, Chase Manhattan, and Microsoft, have implemented enterprise-wide systems for risk management. For each risk identified as important, these firms determine the best approach for improving their management of exposure, whether by insuring, transferring, mitigating, or retaining the risk. The goal is not just to hedge a fixed set of risk exposures, but to determine the areas and lines of business in which a company is willing to retain risks in order to generate target returns.

Adapted to the public sector environment—and customized to reflect the government’s budgetary and regulatory processes, the legislative and legal environments, and the risks being evaluated—this approach can be used to manage a government’s exposure to risk, particularly contingent liability risk. The model involves six main steps:
- Identifying the government’s risk exposures.
- Measuring or quantifying expected and unexpected exposures.
- Provisioning for expected costs in the budgetary process.
- Assessing the government’s tolerance for bearing risk.
- Using the government’s risk tolerance as a basis for establishing policies and procedures for structuring reserves against unexpected losses.
- Implementing risk mitigation and control mechanisms to prevent unintended losses on those risks and establishing systems to continually monitor and reassess the government’s risk exposure over time.

As in the private sector, these steps should be applied to four general categories of risk: financial, operational, business, and event risk.

Measuring risk

A government’s exposure to loss can arise from a wide variety of events, and attempting to account for every source of exposure is not feasible. A better approach, and that followed in the private sector model, is to first examine general categories of risk and then focus on the areas of highest risk (see figure 1 for a lattice of generic risks). The next step is to value the
expected and unexpected losses (see box I for a definition of expected and unexpected losses). The valuation techniques used will depend on the type of risk being analyzed and the data available. Actuarial and econometric models can be used to estimate exposures, but both techniques require substantial data on the performance of a program (or on a comparable program). For project finance, where deals are unique and data records often missing or of low quality, more advanced modeling approaches are required. The most powerful are those commonly used to value options in financial markets; these can be applied to value direct loans, loan guarantees, and insurance contracts granted to support infrastructure liabilities.

**Budgeting for expected costs**

Armed with a measure of risk exposure for expected costs, a government can use the information as a budgetary control mechanism and work out how to improve the budgetary process to provide stronger incentives for risk management. The government could publish its risk exposure in the national budget, use it to establish exposure limits or credit limits, or use it to develop risk-adjusted performance measures. (Such measures could be applied to reward programs that deliver social benefits with the least risk to the public budget.)

The main impediment to implementing these options is the cash budget accounting system used by most governments. While private institutions compute virtually all investment decisions, expenditures, plans, and budget forecasts on a present value basis, most government bodies account for credit and insurance products using a simple cash-based system of budgeting. Cash-based budgeting 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 a government could help finance a US$100 loan to a private infrastructure provider. If the government provides a 10 percent loan subsidy, the cash budget cost would be US$10 in year one. If it provides the loan directly, the cash budget cost in year one would be US$100—the full face value of the loan. And if it agrees to guarantee a loan by a private bank, the budgetary cost would be zero (or negative if a guarantee fee is collected) in the first year. Thus while the economic and financial values of the three forms of financial assistance are equal, a legislative body would favor the guarantee option. Only by enforcing budgetary controls at the time the financial assistance is committed can the budgetary incentives be realigned to eliminate this effect.

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. Often governments prefer incremental changes or interim steps to smooth the transition. 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 con-
Consider a government loan guarantee program characterized by the following very simple probability distribution. While the expected costs of the program (the mean of the distribution) are US$10, losses will exceed this expectation 35 percent of the time. That means that if the government sets reserves only to cover expected losses, it will have to request additional funds in 35 percent of all possible outcomes of the guarantee. For a portfolio of thirty similar programs and with five-year guarantees, the central government would have to go to the legislature twice a year for additional funds.

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<th>Probability</th>
<th>Exposure</th>
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<td>(percent)</td>
<td>(millions of U.S. dollars)</td>
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<tr>
<td>2.5%</td>
<td>30</td>
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Resolving for unexpected costs

In addition to budgeting for the full expected present value of costs, governments need to set aside reserves against unexpected losses. For a private firm 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.

A private firm must also weigh the expectations of shareholders and stakeholders, rating agencies, and business partners in determining the optimal level of capital. The capital or reserves held by an enterprise reflect 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 one-year period) than a firm seeking an A rating (capital to cover a 90 percentile event).

Similar pressures come into play in assessing government tolerance for risk. But the assessment must also consider the unique question of how often the executive wants to go to the legislature for funds. Once the proper valuation tools are in place, the government can set reserve policy based on an assessment of its aversion to making frequent funding requests. The government’s leverage considerations will also be different from those in the private sector. Holding more funds in reserve increases the liquidity of the guarantees that the reserve supports, increasing their value and allowing the government to leverage more private funding in the guarantee program. But reserving funds in a separate account reduces the money available for other public sector projects and services. 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.

Setting reserves

Having assessed which risks and what level of loss it is willing to bear, the government can set
its reserves against unexpected losses ("risk capital") in its credit and insurance programs. But first it 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, and where the reserves should reside.

Under an additive reserve standard the government calculates the unexpected loss exposure of each of its contingent liabilities independently (that is, examines the sensitivity of each guarantee valuation to changes in the underlying factors). 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. It then identifies the average cash reserve required to fund these unexpected losses. Finally, it aggregates the individual cash reserve balances to arrive at a total unexpected loss reserve.

The problem with the additive approach 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 provided than originally sought by the government. 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 entire portfolio.

**Investing reserves**

The objective in investing the reserve funds should be to maximize the value of the assets 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. In doing this, the government may achieve better results by managing its assets and liabilities at the balance sheet level rather than on a program basis.

The government also needs to decide whether to hold its reserves offshore, in a foreign currency, or domestically, in the domestic currency. If the 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 strategy would greatly enhance the market value of the guarantees and provide the government with greater leverage from the guarantee program. However, decisions on the location of the reserves must be made in the context of the government’s broader foreign currency risk management program.

**Next step**

This approach to risk management also provides a mechanism for governments to critically assess the distribution of risks within a loan guarantee or insurance program and come up with better designed contracts and fewer and smaller calls on guarantees. And as risks change over time, the framework provides a basis for easy reestimation and quick adjustments to the budgetary and reserve system. A companion Note shows how.

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1 When a private company assesses the tradeoff between holding reserves and 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 return. Calculating social 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 Note focuses on reserving against contingent liabilities without considering a broader asset-liability management policy.

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