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Managing Contingent Liabilities in Public-Private Partnerships

Practice in Australia, Chile, and South Africa

Timothy Irwin

Tanya Mokdad



THE WORLD BANK



PPIAF

PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY

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ABBREVIATIONS AND ACRONYMS

AASB	Australian Accounting Standards Board
CAPM	Capital-Asset Pricing Model
DTI	Department of Trade and Industry
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IFRIC	International Financial Reporting Interpretation Committee
IMF	International Monetary Fund
PPIAF	Public Private Infrastructure Advisory Facility
PPP	Public-Private Partnership
SEITA	Southern and Eastern Integrated Transport Authority

FOREWORD

“Sweeping the dirt under the rug” is never considered a wise strategy, be it for an individual, a community or society. Ultimately, the mess balloons. The clean up takes longer and winds up being more expensive. Contingent liabilities in Public-Private Partnerships (PPPs) are often of this nature. If they are not properly identified, assessed and dealt with in a transparent way, the debt can easily spiral out of control. What on the surface appears as an attractive deal to engage the private sector in infrastructure services can wind up as an unmanageable financial burden for the country and its finance officials. Hence, the prudent management of contingent liabilities in PPPs is a necessary element of public policy, so that missteps of today do not end up burdening the potential real development and growth of tomorrow.

This volume describes the evolution of good practices in three countries Australia, Chile and the Republic of South Africa, all of which have been on the forefront of assigning risks to contracting parties best suited to mitigate those risks. The country case studies provide succinct analysis of the issues, challenges and outcomes, and the fourth chapter suggests good practices for other countries interested in promoting PPPs in infrastructure.

The volume is therefore an extremely useful source of information and knowledge for any policy maker or sector specialist interested in learning more about the “dos and don’ts” of contingent liability management in PPP transactions.

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SUMMARY

Governments that use public-private partnerships (PPPs) to build infrastructure usually assume contingent liabilities relating, for example, to early contract termination or to debt and revenue guarantees. Deciding whether to assume these liabilities and, if so, determining how to value, monitor, and limit them is difficult for most governments. This report describes how governments in Australia, Chile, and South Africa have tackled these problems, and discusses whether other governments, including those with less administrative capacity, should adopt similar practices.

All three countries rely on careful project preparation, competitive bidding, and a review of proposed PPPs by a specialized unit in the Ministry of Finance. South Africa, for example, requires the Treasury to approve PPP proposals at four stages before a contract is signed. The proposals that seek the Treasury's approval must discuss contingent liabilities. A PPP manual and a set of standard contractual terms guide the development of the PPPs and thus limit the contingent liabilities they create. Chile is notable for measuring and valuing contingent liabilities associated with revenue (and previously exchange-rate) guarantees for toll-road and airport concessions, and for publishing the results of the measurement and valuation every year. Australian governments are notable for restricting their risk-bearing in many recent projects to risks that they can control, thus minimizing their contingent liabilities. They also publish PPP contracts and project summaries and prepare financial reports according to International Financial Reporting Standards, which reduces the temptation to use PPPs to disguise fiscal costs.

Other governments that want to improve the management of contingent liabilities associated with PPPs might adopt some of these policies, including multistage review of proposed PPPs by people in the Ministry of Finance who have expertise in PPPs and fiscal management; quantification of certain

contingent liabilities, especially when quantification is likely to influence the decision whether to incur the liability; and publication of PPP contracts and summary descriptions of their financial implications. The adoption of modern accrual accounting is helpful in Australia, but it raises bigger issues than the management of PPP-related contingent liabilities.

INTRODUCTION

Chapman's Peak Drive runs along the side of a mountain near Cape Town in South Africa. Described as "impossible" when first proposed, the road was nevertheless hacked and blasted out of the steep cliffs of the mountain between 1915 and 1922. It has always been vulnerable, however, to falling rocks and other debris, and in January 2000 the Western Cape Provincial government closed the road after fire and heavy rain caused major rockslides and the death of a passenger. To improve the road, the government used a public-private partnership (PPP), an arrangement that was then becoming popular in South Africa. The government called for proposals in August 2001. Two consortia bid, and in May 2003, the government and the Entilini concession company signed a 30-year concession contract. Entilini repaired the road and, using state-of-the-art modeling and engineering, reduced its vulnerability to rock falls. The road reopened in December 2003, at an estimated capital cost of about South African rand (R) 150 million, split roughly equally between the province and the concessionaire.¹

The government hoped that tolls would cover the concessionaire's costs. But it agreed to compensate the concessionaire in certain circumstances if toll revenue was less than a forecast made in 2002. When the road opened, the concessionaire would have to collect tolls from a temporary plaza while it waited for approval from the national Department of Environmental Affairs and Tourism to build permanent toll plazas; the provincial government agreed

1. This account is drawn from the South African National Treasury's *PPP Quarterlies* 3 (June 2001) and 7 (June 2002); Farlam (2005); Dreyer and others (2005); Gosling (2009); Yeld (2009); <http://www.candor.com/chapmanspeak/>; and discussions with officials.

to bear traffic risk until that approval was granted and the plazas were built. The provincial government also agreed to bear traffic risk during certain road closures. Additionally, the government gave a revenue guarantee that, independent of the provisions relating to toll plazas and road closure, partially protected the concessionaire's lenders from revenue risk.

After lengthy appeals, final approval of the toll plazas was granted in June 2008, and only then could construction of the toll plazas begin. As often happens,² traffic initially fell short of forecasts. In the absence of permanent toll plazas, the government had to top up the concessionaire's revenue. Revenue eventually reached forecast levels. But in July 2008, the concessionaire closed the road because of another rockslide. Because the toll plazas were not yet constructed, the government bore the traffic risk and had to pay the concessionaire an amount equal to all its forecast revenue. From December 2003 to January 2009, it paid the concessionaire R 57 million.

This experience raises the question whether the best means to compensate the concessionaire for the absence of permanent toll plazas was for the government to pay the difference between actual and forecast traffic. But it is easy to be wise after the fact; decisions about risk-bearing are better judged on the basis of the information available at the time of the decision. Nevertheless, this case illustrates the kinds of contingent liabilities that arise in PPPs and the need for governments to pay attention to them, both after a contract is signed and before.

In the last two decades, many other governments have also used PPPs to obtain financing for infrastructure projects. Also known as concessions, these arrangements allow the government to get infrastructure built without having to pay for (all of) it immediately. In some cases, the government pays for the service in installments over the term of a contract. For example, the government may enter into a PPP for a road in which it agrees to make a series of monthly payments to the road company as long as the road is properly maintained. In other PPPs, such as toll roads, users pay for the service.

Using a PPP can reduce the fiscal cost of a project if it causes the project to have lower costs or higher revenues. A private project company, responsible for both construction and operation, may, for example, have stronger incentives to minimize the joint cost of construction and operation than a government agency. It may be better at collecting revenue from users. And user fees might be easier to impose if the government is not providing the service itself. Although real differences may exist between the fiscal cost of PPPs and the fiscal cost of traditional publicly financed projects, the apparent difference is mainly an illusion caused by primitive accounting. In a PPP

2. On the general issue, see Skamris and Flyvbjerg (1997) and Standard & Poor's (2003).

in which the government is the purchaser of the project's output, the government's payments are just deferred, not avoided. In a PPP in which users pay, the fiscal cost is an opportunity cost: The government avoids expenditure, but it also gives up revenue. The net present value of the government's future cash flows does not change—unless the project company is better than the government at collecting revenue or containing costs.

In all PPPs, the government typically bears some of the risks of the project—although not as much of the risk as it would bear if it used traditional public finance. As in the case of Chapman's Peak, the government may protect the project company or its lenders from some of the risks of uncertain user-fee revenue. It may also agree to bear the unknown costs of cleaning up possible environmental problems or of acquiring land for the project. It usually agrees to make a compensating payment to the project company if the PPP contract is terminated before the contract's scheduled end. The pressures and rationales for such risk-bearing are enduring, but they became stronger during the financial crisis of 2008–09, as lenders and investors grew more cautious.

Although not all these risks create contingent liabilities for accounting purposes, they do create obligations that are conveniently, if loosely, called contingent liabilities.³ Roughly speaking, contingent liabilities require expenditure only if an unlikely future event occurs. Contingent liabilities thus differ from the ordinary liabilities that a government incurs when it borrows money or otherwise commits itself to making payments.

Contingent liabilities create management problems for governments. They have a cost, but judging what the cost is and whether it is worth incurring is difficult. Except in the case of contingent liabilities created by simple guarantees of debt, governments usually can incur contingent liabilities without budgetary approval or recognition in the government's accounts. So governments may prefer contingent liabilities to other obligations. (The uncertainty surrounding contingent liabilities can work differently. It is well known that PPPs create contingent liabilities, and the International Monetary Fund (IMF), the World Bank, and others often warn of the risks. The initial reaction of a cautious Ministry of Finance may be to seek to avoid all contingent liabilities.) Management problems also arise once a government has incurred a contingent liability. Projects

3. The term "contingent liability" is problematic, both conceptually and in practice, and the International Accounting Standards Board has proposed eliminating it from accounting standards (IASB 2005). One issue is that the probability of payment under a contractual obligation can vary continuously from zero to 1, and any division of that interval into two parts, one for contingent liabilities and the other for ordinary liabilities, is arbitrary. For more on definitions of contingent liabilities, see Blair and Jagolinzer (2008), Irwin (2007, chap. 6), and IASB (2008).

need to be monitored to reduce risks if possible. Spending on contingent liabilities must sometimes be forecast, despite the difficulty.

Many sources provide recommendations on managing contingent liabilities created by PPPs. An idea underlying most of the recommendations is that the rules governing PPPs should ensure that the officials and ministers in charge have incentives, information, and the capability to take account of the costs and risks of contingent liabilities. Specific proposals that have been made include the following:⁴

- Cost-benefit analysis should be used to select projects, and value-for-money analysis should be used to choose between PPPs and public finance.
- The costs and risks of contingent liabilities should be quantified.
- PPPs should be approved by the cabinet, the ministry of finance, or some other body with an interest in future spending. The Ministry of Finance should review proposed PPPs.
- Governments should bear only those risks that they can best manage, which generally are those that they can control or at least influence.
- Modern accrual-accounting standards should be adopted for financial reporting, to reduce the temptation to use PPPs to disguise fiscal obligations.
- PPP contracts should be published, along with other information on the costs and risks of the financial obligations they impose on the government.
- Budgetary systems should be modified to capture the costs of contingent liabilities.
- A guarantee fund should be used to encourage recognition of the cost of guarantees when they are given, or to help with payments when guarantees are called.
- Governments should charge fees for guarantees.

Although there is no shortage of recommendations, it is harder to discover what governments have done to improve the management of contingent liabilities associated with PPPs.⁵ This report aims to help remedy this problem

4. For recommendations on the management of contingent liabilities associated with PPPs specifically, see Lewis and Mody (1997); Currie (n.d.); Hemming and Staff Team of the IMF (2006); Irwin (2007); and Schwartz and Corbacho (2008). The guidelines produced by government agencies in charge of PPP policy also contain a great deal of relevant advice, even if they do not refer specifically to the management of contingent liabilities. See for example Government of Australia, Infrastructure Australia (2008a, 2008b) and Government of South Africa (2004b, 2004c). On the management of contingent liabilities generally, see Brixi and Schick (2002) and Cebotari and others (2008).

5. On Colombia, however, see Lewis and Mody (1997) and Echeverry and others (2002).

by describing the policies of governments in three countries that are considered examples of good practice: Australia, Chile, and South Africa.

For each country, the report considers who must approve a proposed PPP contract and the contingent liabilities it creates. Is the Ministry of Finance involved, for example, and if so which part of the Ministry of Finance? At what stages of project preparation must the government agency developing a PPP seek approval from the Ministry? This report also considers the analysis of contingent liabilities that is undertaken before they are incurred. For example, does the government seek to quantify the costs and risks of contingent liabilities? Additionally, the report reviews the way PPPs and contingent liabilities are reported to the public in the government's accounts and other documents. For example, are PPPs treated as public projects for accounting purposes, so that the capital cost of the project is treated as a liability on the government's balance sheet? If not, are contingent liabilities disclosed in some way?

It is difficult to draw conclusions for other countries from just three case studies, and the aim of this report is simply to describe the relevant practices of the three countries. By drawing on the experience of these and other countries, however, the report also discusses which of the three countries' practices appear to be suitable candidates for adoption by other countries, including those with less administrative capacity than Australia, Chile, and South Africa.

2.

AUSTRALIA

Australia’s experience with PPPs goes back 150 years, to the time of the first railways. The recent wave of PPPs dates, however, from the 1980s. Since then, all Australian states and territories have used PPPs (see table 1). The state that has made the greatest use of PPPs, by number and value, is Victoria, which has used them for jails, courts, hospitals, and convention centers, and two big urban motorways, City Link and EastLink.

**Table 1. Modern PPPs in Australia, Value (\$A million)
and Number of Projects by Jurisdiction, December 2006**

	Multi	N.S.W.	N.T.	Queensland	S. A.	Tas.	Victoria	W. A.	Total
Correctional		25 1		89 2	0 ^a 1		1,370 8	79 1	1,563 13
Education		315 2		240 1			90 1		645 4
Energy	1,450 4	717 5	380 1	2,311 7	820 4	78 1	874 10	863 7	7,493 39
Entertain- ment		703 2	1,100 1				1,066 4		2,869 7
Health		359 4		561 1		30 1	1,019 4	700 ^a 2	2,669 12

	Multi	N.S.W.	N.T.	Queensland	S.A.	Tas.	Victoria	W.A.	Total
Information Technology							360 3		360 3
Justice							140 1	210 2	350 3
Rail	1,300 1	266 2		223 1			4,362 6		6,151 10
Road		7,550 9		82 1			4,455 3		12,087 13
Waste				105 1					105 1
Water		658 5		70 2	324 6		325 9		1,377 22
Total	2,750 5	10,593 30	1,480 2	3,681 16	1,144 11	108 2	14,061 49	1,852 12	35,669 127

Source: English 2006.

Note: N.S.W is New South Wales. N.T. is Northern Territory. S.A. is South Australia. Tas. is Tasmania. W.A. is Western Australia. For each category of projects, the numbers in roman type in the first row are estimates of cost in million Australian dollars, and the numbers in italics in the second row are numbers of projects. The table includes projects from the 1980s.

a. These estimates of cost exclude the costs of Mount Gambier Prison and the South-West Health Campus, respectively.

As in many countries, the accounting treatment of PPPs provided an impetus for PPPs in Australia. It might seem that accounting would not matter: A government's rights and obligations, including its contingent obligations, are determined by laws and contracts, not by the accounting standards it follows. But accounting often influences the obligations that governments choose to incur. For example, governments usually prefer to report low levels of debt. Sometimes they publicly announce that they will keep debt below a certain level. Sometimes they commit themselves to limits as part of agreements with multilateral lenders or supranational bodies such as the European Union. But the debt that they must report depends on the accounting standards that they follow. For example, an agreement to make a series of monthly payments for a properly maintained road over a 25-year period may create a debt according to one set of standards but not according to another.

In Australia, accounting was important because the intergovernmental Australian Loan Council set limits on state borrowing,⁶ and accounting standards allowed state governments to enter into PPPs without reporting more debt, even if the contracts created obligations similar to debt. Thus, in the late 1980s and early 1990s, when state governments were pushing up against debt limits, many used PPPs to get infrastructure built without having to report more debt (Walker 2003; Maguire and Malinovitch 2004; Quiggin 2004). Over time, this motive for PPPs has diminished, in part because the Loan Council no longer limits state borrowing.

Perhaps the biggest common contingent liability in Australian PPPs relates to early contract termination (Government of Australia 2008a, vol. 3, and 2008b). The amount of government compensation for early termination depends on the cause. If the contract is terminated because of the project company's breach of its obligations, the payment is normally the market value of the project, which is found by rebidding the contract or estimated by an independent valuer. If the cause is force majeure (a natural disaster, for example), the government normally pays an amount linked to the project company's debt and, in some cases, to the book value of its equity as well. If the cause is the government's breach of its obligations, the government fully compensates lenders and shareholders for their losses. In many cases, however, these contingent liabilities related to PPPs for which the government is the purchaser of the project's output. In such cases, the government's main liability is its obligation to pay for the service, and its contingent liability related to termination does not increase the government's total liability: the termination payment replaces the future payments for services.

The extent of the contingent liabilities assumed by Australian governments has varied over time. In 1852, the government guaranteed shareholders in the Melbourne–Mount Alexander railway a dividend of 5 percent of paid-up capital for 25 years (Vogel 1929). In the 1980s, the New South Wales (NSW) government entered into an “ensured revenue agreement” with the developers of the Sydney Harbour Tunnel that protected them from traffic risk (Government of New South Wales, Auditor-General's Office 1994). By contrast, the City Link and EastLink concessionaires in Victoria bear the traffic risk in their projects. The state does bear several risks in these projects, including risks related to acquiring land for the project, but those risks are narrowly defined and, particularly in the more recent EastLink project, under the government's control (on City Link, see Grimsey and Lewis 2004, 37; on EastLink, see SEITA 2008, especially note 16). For example, the state agrees to compensate the concessionaire for changes in law that apply

6. See <http://www.directory.gov.au>.

specifically to the concession company, or to all toll-road companies, but it does not agree to compensate the concessionaire for general changes in law that reduce the project company's value, such as an increase in the corporate tax rate or an increase in all workers' minimum pay and conditions. The contracting agency for EastLink says the following:

The State has retained some specified risks associated with the Project ... known as Possible Key Risk Events... Where sufficient redress is not able to be achieved through [changes in tolls or other means not requiring payment in cash by the state] a financial contribution from the State may be available (as a last resort). However, such a contribution is only available for Possible Key Risk Events which are within the control of the State. A financial contribution from the State is not available in relation to changes in law (other than Discriminatory Changes in State Law), Uninsurable Force Majeure Events or [Environment Protection and Biodiversity Conversation] Events. (*SEITA 2008, note 16*)

As the earlier discussion of guidelines illustrates, the approach in the EastLink contract is not always taken. Australian states do generally bear some risks related to force majeure that they cannot control. Moreover, the global financial crisis has led to proposals for the government to guarantee PPPs' debt, which in some respects echoed historic calls for guaranteed dividends (Infrastructure Partnerships Australia 2009). In September 2009, the Victorian government guaranteed debt for a PPP for a desalination plant. It remains to be seen whether this change is long lasting.

Approval

The State of Victoria has well-developed procedures for assessing proposed PPPs that allow for the review and control of contingent liabilities. The Victorian Department of Treasury and Finance and Cabinet reviews planned projects at several stages (see figure 1). A department considering a PPP that would get its revenue from the government (not users) must first seek approval for the capital spending that would be needed if the project was financed publicly. If a PPP is used, the approval for capital spending is converted into approval for spending on the PPP's services during the operation phase of the project.

Figure 1. Developing and Approving a PPP in Victoria

Service need
Identify service needs versus government priorities; focus on outputs; consider broad needs, over time; allow scope for innovation
Option appraisal
Consider options; consider application of Partnerships Victoria; evaluate financial and other impacts, risks, and benefits (triple bottom line)
Business case
Confirm the project offers net benefit (quantify risks and costs, begin developing a public sector comparator, conduct cost-benefit analysis); assess Partnerships Victoria potential <i>Obtain funding and project approval</i>
Project development
Assemble resources (steering committee, project director, probity auditor, procurement team, contract management team); develop a project plan; further develop the public sector comparator; develop commercial principles; consultation
Bidding process
Develop expression-of-interest invitation <i>Seek approval to issue the expression-of-interest invitation</i> Evaluate responses and develop a short list of bidders; develop a project brief and contract and incorporate contract management requirements <i>Seek approval to issue the project brief</i> Conduct clarification sessions; evaluate bids
Project finalization review
Confirm achievement of the policy intent; confirm value for money; report to the minister; advise the treasurer of intent

Final negotiation

Establish the negotiating team; set the negotiation framework; probity review; report to the minister and treasurer; execute contract; financial close

Transition

Finalize and implement contract management strategy/plan; finalize contract administration manual; implement performance reporting
Seek approval for contract management plan

Contract management

Formalize management responsibilities; monitor project delivery; manage variations; monitor the service outputs; maintain the integrity of the contract

Source: Government of Victoria 2006, figure C1.

Note: PPP = public-private partnership. Steps at which the approval of the Victorian Cabinet or a committee of the cabinet is required are italicized.

In 2001, Victoria published the first Australian PPP guidelines, which included a detailed discussion of “Risk allocation and contractual issues” (Government of Victoria 2001a). In 2008, state guidelines were largely superseded by national guidelines (based in part on Victoria’s), which were endorsed by the Council of Australian Governments. Victorian PPPs must comply with national and “Partnerships Victoria” guidelines. The national guidelines include the following documents: “procurement options analysis,” “practitioner’s guide” (which has a chapter on risk allocation), “commercial principles for social infrastructure” (which is about risk allocation and related issues), “public sector comparator guidance,” and “discount rate methodology” (Government of Australia, Infrastructure Australia 2008a). Draft guidelines on “commercial principles for economic infrastructure” also are available (Government of Australia, Infrastructure Australia 2008b). These guidelines discuss the process that governments should follow to develop and award a PPP contract and the risks that they generally should assume and those that they generally should not. They are therefore an important element of the control of contingent liabilities in PPPs.

Analysis

General practice in Australia separates the analysis of whether a project should proceed from the analysis of how a project should be implemented. Cost-benefit analysis is undertaken as part of the decision whether to undertake a project (see figure 1), a requirement that was emphasized in

introducing the Partnerships Victoria policy: “Prior to a decision in principle to commit to major infrastructure projects, the Government will prepare a full cost benefit analysis of the potential project” (Government of Victoria 2000).

The new national PPP guidelines give advice on measuring risks (see Government of Australia, Infrastructure Australia 2008a, vol. 4). They apply to contingent liabilities in PPPs, but they focus on estimating the risks the government would face if it publicly financed the project.⁷ The guidelines require the government to compare the cost of implementing a project using a PPP with the cost of implementing it using traditional public finance. The guidelines are intended to encourage fair comparison, and they address the concern that cost estimates for publicly financed projects usually ignore contingencies that ultimately cause cost overruns. Thus, the comparison might take a conventional estimate of the project’s capital cost and increase that estimate by a margin to account for an observed downward bias in earlier estimates. Moreover, in many Australian PPPs, the government pays for the service. In these PPPs, the government’s main financial obligations are ordinary liabilities whose amounts are relatively easy to estimate. (For more on the nature of the required analysis, see the section on South Africa, which follows a similar approach.)

Reporting

Balance-sheet treatment of PPPs. Unlike governments in Chile, South Africa, and most of the rest of the world, Australian governments publish financial reports that comply with International Financial Reporting Standards (IFRS). That means that contracting agencies and the government as a whole publish balance sheets that report physical as well as financial assets and a set of liabilities that is not limited to traditionally defined debt.

Because PPPs are controversial and accounting standards influence whether governments use of PPPs, accounting standards for PPPs have been controversial in Australia. In 2005, the Australian Heads of Treasuries Accounting and Reporting Advisory Committee recommended the current approach, in which PPP assets and liabilities appear on the balance sheet of the party that bears most of the risks and rewards normally associated with ownership—an approach based on the U.K. Financial Reporting Standard 5.⁸ Under that

7. Although the documents describe this as “risk valuation,” the Australian approach does not adjust expected payments or the discount rate according to an estimate of the price of a particular risk (unlike the approach to valuing revenue and exchange-rate guarantees in Chile).

8. Part of the reason for controversy about balance-sheet treatment is that, as for contingent liabilities (see footnote 3), risks and rewards (or control) can be shared in many ways, and any way of classifying arrangements into two types inevitably contains an arbitrary element.

approach, the assets and liabilities associated with many PPPs have been put on the government's balance sheet. In Victoria, all Partnerships Victoria PPPs are on the government's balance sheet (except for the City Link and EastLink toll roads).

The International Accounting Standards Board (IASB) recently has taken a somewhat different approach to the issue. International Financial Reporting Interpretation Committee 12 (IFRIC 12) says that *project companies* should recognize PPP assets and associated liabilities on their balance sheet if and only if they *control* those assets (IASB 2006). In 2007, the Australian Accounting Standards Board adopted IFRIC 12 as Australian Interpretation 12 (AASB 2007b). IFRIC 12 has implications for governments, even though it does not apply to them. Accounting standards state that, in the absence of specific guidance, a reporting entity must consider the implications of accounting standards dealing with similar issues. And many project companies have interpreted IFRIC 12 to mean that the physical assets created by PPPs to which they are a party do not belong on their balance sheet. If an asset is not on the project company's balance sheet, it seems to belong on the government's balance sheet. So it seems likely that IFRIC 12 will cause more PPPs to be recognized on governments' balance sheets. The International Public Sector Accounting Standards (IPSAS) Board has suggested that governments take an approach similar to IFRIC 12, but it has not yet issued an interpretation (IPSASB 2008). Reflecting uncertainty about the implications of IFRIC 12, the public contracting agency for the EastLink motorway says that, for the time being, the EastLink project remains off balance sheet:

Due to the lack of applicable accounting guidance on the recognition and measurement by the State of assets arising from certain service concession arrangements, there has been no change in policy and those assets are currently not recognised. (*SEITA 2008, 55*)

Disclosure. Even when PPPs are not recognized on the government's balance sheet, they typically are disclosed in notes to the accounts. The AASB's Interpretation 129 specifies that a PPP contracting agency must provide a description of the arrangement detailing its significant terms, the nature and extent of rights to use specific assets, obligations to acquire the property, renewal and termination options, the amount of revenues, profits, and losses recognized in the period (AASB 2007a, which is based on the international interpretation Standard Industrial Classification [SIC] 129).

The following discussion of the desalination PPP is taken from the Government of Victoria:

The Desalination Project was announced in June 2007, with a capital cost of \$3.1 billion, as part of *Our Water Our Future: The Next Stage of the Government's Water Plan*. A private sector consortium will be responsible for the design, construction, financing, operations and maintenance of the facility, which will be located in the Wonthaggi region

....

The project contract will most likely include an obligation for government to make a payment to the contractor should the Government terminate the contract for default. The quantum of the payment is not expected to exceed the remaining balance of the approved project funding at any time. (*Government of Victoria 2009, 100–101*)

Publication of PPP contracts. Australia is also notable for publishing PPP contracts. In Victoria, all Partnerships Victoria contracts, except those let by state-owned enterprises, are made public within three months of the project's financial close. The EastLink concession, for example, can be found on the Web site of the public contracting agency.⁹ So anyone skeptical of the contracting agency's description of the project can look up the details of the contract (see Parts I and J in particular). True, the contract is 408 pages long. But critics of the government or the project can be expected to scour long documents in search of provisions that could undermine the government or support for the project. Thus, disclosure is significant, even if few people have the time and inclination to read the whole contract.

Disclosure could embarrass the government, but it also could prevent bad deals and indirectly increase public confidence in PPPs. Here is the New South Wales Treasury on the subject:

"A main public concern is the lack of transparency surrounding PPPs. In NSW, this has been address[ed] through the mandatory requirement of disclosing a contract summary, which has been certified as a fair representation by the Auditor-General. Contract summaries aim to provide a general overview of the entire contract. Project contractual documents are now also released to the public usually on the website of the procuring agency. (*Government of New South Wales 2006, 13*)"

A reported problem with the disclosure of contracts in Australia is that contractual amendments and side-agreements are not necessarily published.

9. See <http://www.seita.com.au/pages/eastlink-publications.asp>.

3.

CHILE

The Chilean government began using concessions in the early 1990s to build and upgrade roads.¹⁰ The very first concession was awarded in 1993, for the El Melón tunnel, near Valparaíso. Concessions for sections of the main North–South highway, Route 5, and for other intercity roads soon followed. In the late 1990s, concessions were used to upgrade airports; these concessions were relatively short and two, at Puerto Montt and Iquique, have now been reawarded. More recently, concessions have been used to finance jails, reservoirs, public buildings, and urban roads. Table 2 summarizes the concession program.

Table 2. PPPs in Chile

	Budgeted capital expenditure (billion US\$)	Additional budgeted expenditure arising from renegotiations (billion US\$)	Number of concessions	Average term (years)
Route 5	2.57	0.73	8	23.8
Interurban roads	1.89	0.37	13	27.7
Urban roads	2.16	1.19	5	31.6
Subtotal roads	6.62	2.30	26	27.3

10. Chile’s concession program is described by Gómez-Lobo and Hinojosa (2000); Cruz, Barrientos, and Babbar (2001); IMF (2005); Bitran Colodro (2007); and Engel, Fischer, and Gale-tovic (2009).

	Budgeted capital expenditure (billion US\$)	Additional budgeted expenditure arising from renegotiations (billion US\$)	Number of concessions	Average term (years)
Airports	0.31	0.04	10	13.1
Jails	0.26	0.10	3	22.5
Reservoirs	0.15	0.01	2	27.5
Transantiago urban transport	0.17	0.02	5	15.8
Other	0.15	0.00	4	23.2
Total	7.68	2.47	50	22.7

Source: Engel, Fischer, and Galetovic 2009, 43.

Note: Port concessions, which are governed by a separate law, are excluded. The U.S. dollar amounts are converted from amounts shown in Engel, Fischer, and Galetovic 2009 in UF (*unidad de fomento*, an inflation-indexed unit of account used in Chile) at a rate of US\$35.72 per UF, derived from rates, on April 27, 2009, of 20,985.59 Chilean pesos per UF and 587.54 pesos per USD (www.bcentral.cl).

Most of the road and airport concessions contain revenue guarantees, which typically ensure that the concessionaire will receive revenue with a present value equal to about 70 percent of the expected present cost of the project. Although the revenue guarantees are not legally tied to the concessionaire's borrowing, they do facilitate it. A few concessions have also included exchange-rate guarantees linked to the concessionaire's foreign-currency debt. But these exchange-rate guarantees are no longer in force. Revenue and exchange-rate guarantees typically are combined with rules that require the concessionaire to share revenue and exchange-rate gains. The concession for the El Melón Tunnel included a government guarantee related to the cost of constructing the tunnel. That guarantee and some of the revenue guarantees have been triggered. The amounts of the payments, however, have so far been small relative to the size of the projects (see tables 2 and 3).

Table 3. Chile's Expenditure on Revenue Guarantee

	Million U.S. dollars
1997	0.04
1998	0.10
1999	..
2000	..
2001	..
2002	0.45
2003	2.48
2004	4.34
2005	6.41
2006	9.42
2007	17.37
2008	7.44

Sources: Gomez-Lobo and Hinojosa (2000) for 1997–98; Ministry of Public Works (via Ministry of Finance) for 2002–08. See also Government of Chile (2007), which reports slightly different numbers for 2002–06.

Note: Amounts converted from UF to U.S. dollars using exchange rates noted in table 2. Amounts are gross payments, not payments net of revenue-sharing receipts. No data for 1999–2001 are available.

.. = negligible.

The biggest unplanned costs associated with the concessions have come from renegotiations of concession contracts (see tables 2 and 4). Sometimes, a renegotiation occurs because the government wants the concessionaire to undertake additional work not required by the original contract.¹¹ At other times, it occurs because the construction or operation of the project runs into unforeseen problems. Compensation is sometimes in cash, but may take the form of an increase in user fees or an extension of the term of the concession. The government also bears risks related to land acquisition, including in particular delays in acquisition, for which the concessionaire must be compensated. For urban roads, the costs of moving unmapped gas pipes, telephone cables, and other utilities under urban roads are shared between the government and the concessionaire. If the government terminates the concession before the concession's scheduled end, it must compensate the concessionaire. If the concession ends because of the concessionaire's default

11. Gómez-Lobo and Hinojosa (2000, 16) refer to the “ex-post revelation of the demands of the numerous communities affected by a project,” which may relate, for example, to “the placement of bus stops, pedestrian crossings, resistance to land expropriations and the effects of a project on the dynamics between hub and satellite towns and cities.”

or bankruptcy, however, the lenders are reimbursed only from the proceeds of rebidding the concession, not by the government (Cruz, Barrientos, and Babbar 2001, 6; Engel, Fischer, and Galetovic 2009, 25).

Approval

The Ministry of Public Works takes the lead in designing, awarding, and monitoring concessions. But the minister of finance must approve the concession contract and the Ministry of Finance is involved in the design of the concession contract, its award, and any renegotiations of the contract.¹² The process gives the Ministry of Finance the opportunity to understand and control the contingent liabilities that the government takes on as a result of concessions.

The key group in the Ministry of Finance is the Contingent Liabilities and Concessions Unit, which currently has three members. It is part of the Budget Department and was established in 2006. Although it has considerable expertise in concessions, the unit is responsible for monitoring a wide range of contingent liabilities, not just those associated with concessions. The government's main source of expertise on concessions is the much larger Concessions Department in the Ministry of Public Works, which the Contingent Liabilities and Concessions Unit in the Ministry of Finance relies on for information.

The law on concessions and the associated regulations require the Ministry of Public Works to obtain the approval of the Ministry of Finance before issuing bidding documents. Before giving its approval, the Ministry of Finance requires the Ministry of Public Works to list the risks created by the concession, in part to get a sense of the possible causes of contract renegotiation. It also requires the Ministry of Public Works to get approval from the Ministry of Planning for the analysis of the project's economic and social benefits. The Ministry of Finance must approve any circulars that clarify or modify economic aspects of the bidding documents, and the Ministry must be represented on the selection committee that evaluates the bids. The minister of finance must sign the supreme decree issued by the minister of public works that formalizes the concession. All supreme decrees must also be approved by the comptroller and auditor-general and signed by the president.

The Ministry of Finance's role continues after the concession has been awarded. The minister of finance must sign any supreme decree that formalizes a change in the concession. The Ministry of Finance also must approve any agreement between the concessionaire and the Ministry of Public Works to resolve disputes under conciliation. (Responsibility for this work is not assigned to the Contingent Liabilities and Concessions Unit but rather to a different unit in the Budget Department.)

12. The text in the next two paragraphs is taken with modifications from World Bank (2007).

Budgetary reforms. Chile's budgeting is cash based. That is, the Congress authorizes cash expenditure in the coming year. Decisions to provide specific guarantees or subsidies beyond the coming year do not need Congress's authorization. This likely was one of the attractions of concessions to the government. (In passing the Concessions Law, the Congress did approve the use of concessions in general and anticipate the use of subsidies and guarantees in particular.) Budgeting for spending under the revenue guarantees is helped by a delay between the time a guarantee is triggered and the time the government must pay the concessionaire. For example, a payment related to a shortfall in toll revenue collected in a given calendar year might be due in July of the following year.

In 2002, Chile adopted a fiscal rule requiring the government to run a surplus (the goal was later changed to balancing the budget), which may influence the choice between concessions and public finance.¹³ According to the accounting that currently underpins the fiscal rule, a publicly financed investment initially reduces the reported surplus, whereas a concession initially leaves it unchanged. Thus, if the Chilean government were struggling to achieve the surplus required by the rule, it might prefer to use a concession to carry out an investment project. In the last few years, by contrast, when the government's fiscal position was extremely strong, the government might have preferred to use public finance, to reduce the reported surplus and thus reduce pressure for other spending.

Guarantee fees. In the early concessions, the government charged no explicit fee for revenue guarantees. Of course, the revenue-sharing agreements that accompanied the revenue guarantees are a form of payment. Thus, if bidders believed that the guarantee was more valuable than the associated revenue-sharing obligation, the offer of the guarantee would have improved the terms on which they agreed to undertake the concession. In 1998, however, the government offered an optional revenue guarantee for the concession for Route 68 (Santiago–Valparaíso–Viña del Mar) and required bidders accepting the guarantee to pay a fee for it. Two bidders sought the guarantee; the winner and one other bidder declined the guarantee (Gómez-Lobo and Hinojosa 2000). A key difference between the concession for Route 68 and previous concessions was that Route 68 was awarded on a least-present-value-of-revenue basis, which reduced the concessionaire's exposure to demand risk and thus reduced the demand for a guarantee (Engel, Fischer, and Galetovic 2001). The government now offers guarantees for a fee, even if the concession is not awarded on a least-present-value-of-revenue basis.

13. The text in this paragraph is taken with modifications from World Bank (2007).

Monitoring. The Ministry of Public Works is responsible for monitoring concessions once contracts are signed. (When the Ministry of Public Works executes a concession on behalf of another ministry, as in the case of jails and airports, a committee including representatives of both ministries is involved.) The Ministry of Public Works thus plays a key role in mitigating risks where possible and in providing early warnings of expenditure. The high regard in which the Chilean concessions program is generally held suggests that contract monitoring probably is reasonably good in many respects (Constance 2004; IMF 2005). But problems have been identified that are relevant to the management of contingent liabilities. For example, the Ministry of Public Works has been criticized for failing to independently collect data on traffic flows to verify claims under the revenue guarantees (Engel, Fischer, and Galetovic 2009, 46). The ministry does, however, sample traffic flows and can terminate a concession if it discovers that the concessionaire has provided inaccurate traffic data. Concerns have also been expressed about the sharing of information between the Ministry of Public Works and the Ministry of Finance.

Analysis

Compared with other countries, Chile's approach to managing contingent liabilities relies heavily on quantitative analysis. This reliance on analysis may reflect both the quantitative analytical skills of Chilean officials and the fact that Chile's PPPs involve bigger guarantees than those of, say, Victoria.

Cost-benefit analysis. Chile was one of the pioneers of the use of cost-benefit analysis for public investment projects (Fontaine 1997), and projects that are concessioned are subject to cost-benefit analysis. Projects generally must have an expected annual social rate of return exceeding a threshold (currently 8 percent), although Engel, Fischer, and Galetovic (2009) report that the Ministry of Public Works has sometimes circumvented this control.

Comparison with public financing. Concessions are the default choice for projects whose estimated financial rate of return is sufficient to attract private investors, or close enough that only a small subsidy is required. Comparisons of the estimated fiscal cost of a concession and the estimated fiscal cost of a publicly financed project have been undertaken only for projects for which the government is the purchaser of the services, such as dams, jails, and public buildings.

Quantification of contingent liabilities. In the late 1990s, the Ministry of Public Works commissioned a study that estimated the fiscal effect of revenue guarantees and revenue sharing (Gómez-Lobo and Hinojosa 2000). Later, the Ministry of Finance, in collaboration with the Ministry of Public Works, commissioned further work on the quantification of guarantees and

on the options for managing them from the World Bank (World Bank 2003, 2007). This work led to the development of a spreadsheet model that could estimate the expected cost of revenue and exchange-rate guarantees (and the expected revenue from revenue- and gain-sharing arrangements) for each year of each concession. The model also generated an estimate of the probability distribution of future spending and revenue each year, which allowed estimates of cash flow at risk and similar measures. In addition, the model allowed the risk-adjusted value of the guarantees to be estimated, taking account of the fact that revenue risk is partly systematic, which means that the value of a revenue guarantee is greater than the expected payment discounted at the risk-free rate (see appendix 1 for details). The Ministry of Finance took over the model and developed it further, extending its scope to include airports as well as roads. The ministry now uses the model to estimate the cost of possible guarantees, to set guarantee fees, and to report information on the costs and risks of guarantees (see table 4, for example).

Table 4. Liabilities in Chilean Concessions, September 2008
(US\$ million)

	Initial estimate of investment	Present value of subsidies and payments for services	Present value of spending promised in renegotiations	Maximum payment under revenue guarantees	Net present value of revenue guarantees and associated revenue-sharing arrangements (sum)
Route 5	2,700	836	112	3,476	117
Other intercity roads	2,095	1,195	79	1,195	93
Urban highways	2,563	28	699	953	6
Dams	158	218	9	n.a.	n.a.
Airports	346	50	0	105	16
Jails and courts	329	1,131	0	n.a.	n.a.
Others	224	22	4	93	?
Total	8,414	3,479	903	5,822	232
Projects being bid	481				

Sources: Government of Chile 2008a, 2008b.

Note: n.a. means not applicable because the contract does not contain guarantees.

? means not estimated.

Estimated investment is based on winning bidders' technical offers.

Reporting

Financial reporting. Chilean generally accepted accounting principles, which are accrual-based but not as developed as IFRS, put some but not all PPPs on the government's balance sheet. Recently, for example, jails and airports were treated as public projects for accounting purposes, but roads were not. The Chilean government may adopt IPSAS (which in large part are based on IFRS). Whether and when it does will depend on the adoption, outside government, of IFRS.

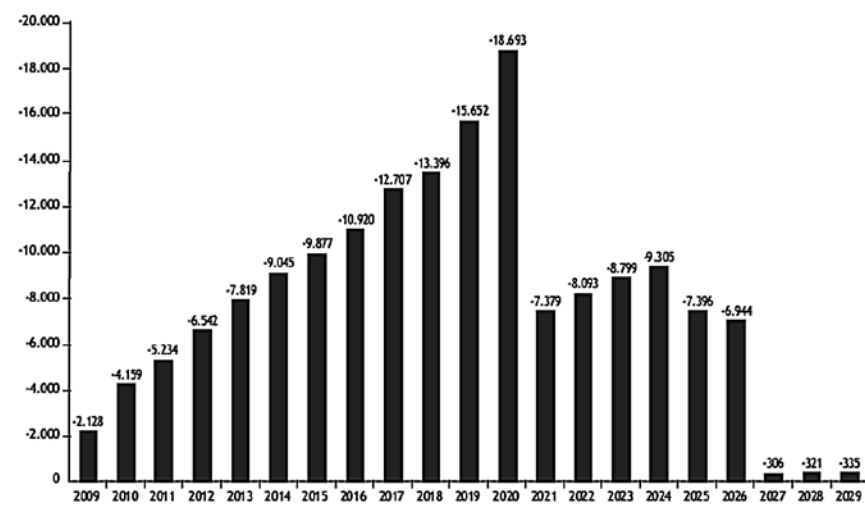
Financial statistics. For the purposes of the fiscal rule, the accounting that matters is prepared, roughly speaking, according to the IMF's *Government Finance Statistics Manual* (2001). The IMF's manual provides for accrual accounting that requires public investments to be expensed over their life-time, not as they are constructed. In Chile, however, public investments in physical assets are expensed during construction. This means that public investment in a toll road would immediately increase government spending for the purposes of calculating compliance with the fiscal rule. By contrast, as the statistics actually are compiled in Chile, concessions have no immediate effect on government spending for the purposes of the fiscal rule.

Other reporting. The government prepares two other reports that provide a great deal of information on the fiscal costs and risks of concessions. The first is an annual report on public finances (Government of Chile 2008a). The second is an annual report on contingent liabilities (Government of Chile 2008b). The report on public finances estimates the most the government could spend on revenue guarantees and estimates the net present value of the guarantees and revenue-sharing arrangement (see table 4). The report also estimates the present value of committed subsidies and availability payments. The report on contingent liabilities discusses not only expected cash flows from revenue guarantees but also the variability of those cash flows (see figure 2). In addition, Chile now publishes contracts and related documents, including changes made after renegotiations.¹⁴

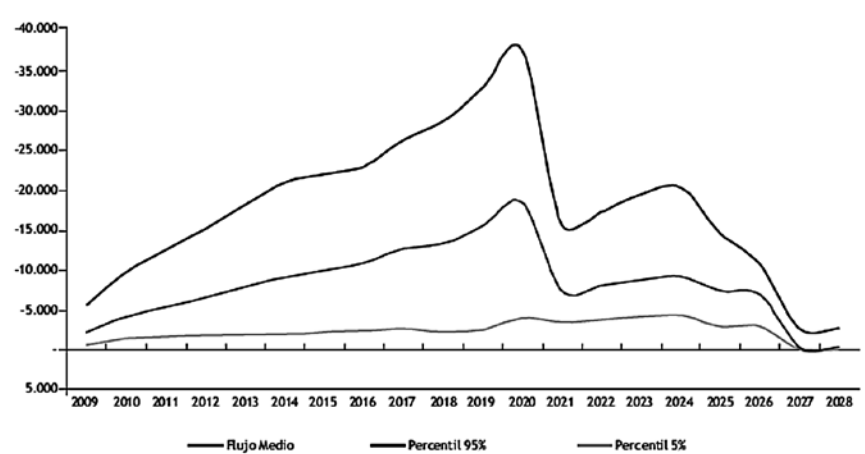
14. See http://www.concesiones.cl/index.php?option=com_content&task=blogcategory&id=114&Itemid=443 (accessed March 26, 2010) .

Figure 2. Forecast Payments from Chilean Revenue Guarantees (million pesos)

A. Expected payments



B. The 5th, 50th, and 95th percentiles of the forecast distributions



Source: Government of Chile 2008b.

Note: A decimal point is used in Spanish where a comma would be used in English, so that 5.000 means five thousand. “Flujo medio” is the median (50th percentile) of the estimated probability distributions of cash flows. The other lines are the 5th and 95th percentiles of the estimated distributions. The peso–U.S. dollar exchange rate was 588 on April 27, 2009. So, for example, 40 million pesos, the rough peak of the 95th percentile around 2019, is about US\$70 million.

4.

SOUTH AFRICA

South Africa's PPP program began in the late 1990, with two toll roads, two jails, and several retail concessions in national parks. (Similar arrangements, under a different name, have also been used for power plants). Later, PPPs were used for hospitals and health services, government office buildings, government vehicle fleets, and the Gautrain, a new railway linking Pretoria and Johannesburg (see appendix 2).¹⁵

In most contracts in South Africa, the public contracting agency's biggest contingent liability is an obligation to compensate the project company if the contract is terminated before its scheduled end.¹⁶ As elsewhere, the amount of the required compensation depends on the reason the contract is terminated (see Government of South Africa 2004c). In the case of a project company's default, South Africa's normal practice differs from that of Chile and Victoria: the required compensation may be a predetermined fraction of the outstanding debt, if this is greater than the market value of the project. This means that the government may bear some of the losses associated with the project company's default (alongside shareholders and lenders).

In two PPPs in which the project company gets its revenue mainly from user fees, the public sector has also assumed contingent liabilities related to demand for the project's services. The two PPPs are Chapman's Peak and the Gautrain, which has a patronage guarantee that protects that project company from downside demand risk. Roughly speaking, the provincial govern-

15. Information on South Africa's PPPs can be found in the National Treasury's PPP Quarterly, available at www.ppp.gov.za.

16. In PPPs in which the government pays for the service, contract termination means that the government no longer has to pay for the service, so the contingent liability is not simply additional to the obligation to pay for the service.

ment will pay the concessionaire the difference between the concessionaire's actual revenue and a predetermined minimum, if actual revenue is below the minimum. The minimum is an estimate of the revenue the concessionaire needs to cover all its costs, including the cost of capital. It exceeds forecast revenue by some R 360 million a year (Government of South Africa 2006, 2).

Approval

Treasury Regulation 16 of 2004, issued under the Public Finance Management Act 1989, sets out rules that govern the development and execution of a PPP contract. Among other things, it prescribes a four-stage process for the approval of national and provincial PPPs by the National Treasury. The approvals are known as I, IIA, IIB, and III. Among other things, they give the Treasury the opportunity to ensure that the contingent liabilities created by the contracts are acceptable. (Municipal PPPs are reviewed but not approved by the National Treasury.)

Treasury Approval I must be obtained before procurement begins. The rules concerning this approval require the contracting agency—

“To determine whether the proposed PPP is in the best interests of an institution, the accounting officer or the accounting authority of that institution [generally the chief executive] must undertake a feasibility study that—

(a) explains the strategic and operational benefits of the proposed PPP for the institution in terms of its strategic objectives and government policy;

...

(c) in relation to a PPP pursuant to which an institution will incur any financial commitments, demonstrates the affordability of the PPP for the institution;

(d) sets out the proposed allocation of financial, technical and operational risks between the institution and the private party;

(e) demonstrates the anticipated value-for-money to be achieved by the PPP; and

(f) explains the capacity of the institution to procure, implement, manage, enforce, monitor and report on the PPP. (*Government of South Africa 2004a, 4–5*)”

Treasury Approval IIA must be obtained before bidding documents, including the draft PPP contract, can be issued. Treasury Approval IIB must be obtained before appointing a preferred bidder. Treasury Approval III must be obtained before the contract is signed. The last two approvals are designed in part to ensure that the contract still has the benefits identified earlier and that the agency will be able to manage the contract.

The National Treasury has established a PPP unit, which has led the review process. The unit has produced a PPP manual and a set of standard provisions for PPP contracts to guide contracting agencies (Government of South Africa 2004a, 2004b).

The PPP manual (module 5) suggests that the application for Treasury Approval III include a section on contingent liabilities, which it explains as follows: “A contingent liability is a liability that accrues to the institution through the PPP agreement but only has an actual, financial impact if a future, uncertain event occurs. An example is compensation payable upon early termination of the PPP agreement.”

In addition, section 66 of the Public Finance Management Act 1999 states that departments (and other entities) may not

borrow money or issue a guarantee, indemnity or security, or enter into any other transaction that binds or may bind that institution or the Revenue Fund to any future financial commitment, unless such borrowing, guarantee, indemnity, security or other transaction ... is authorized by this Act.

In the case of the national government, the Act authorizes the minister of finance to enter into all such transactions and to authorize responsible ministers to grant guarantees, indemnities, and securities if they have the written concurrence of the minister of finance. Within the Treasury, a Guarantee Certification Committee advises the minister on whether to concur with proposed guarantees. This provision is considered relevant to any third-party guarantees of obligations in a PPP contract, but not to financial commitments that might be considered guarantees. (The PPP standardization document refers to this part of the Public Finance Management Act when it discusses indemnities, but not when it discusses termination payments.)

The standardized PPP contract provisions document discusses the provisions that should be in PPP contracts and provides examples of drafting. Among other things, it sets out in some detail the provisions that should govern early contract termination and associated compensation payments. It thus plays a key role in controlling the contingent liabilities that the public sector incurs in PPPs.

In 2006, influenced in part by the potential size of the contingent liabilities associated with the Gautrain, the National Treasury reviewed the way it managed contingent liabilities in PPPs. One of the outcomes of the review was to reallocate review of proposed PPPs within the Treasury. Part of the thinking behind this change was that the PPP unit was not in a position by itself to judge whether large liabilities associated with PPPs were acceptable to the government; that judgment required the involvement of parts of the Treasury, such as the asset-and-liability-management group, that could take a broad

view of the government's financial position. In particular, the Guarantee Certification Committee now reviews liabilities associated with (large) PPPs during Treasury Approval III. To reflect that change, the committee was renamed the Fiscal Liability Committee. Although the PPP unit remains the key advisor on PPPs, the control function is now shared with other parts of the Treasury. The Fiscal Liability Committee has so far reviewed and approved several new PPPs—and its members have remarked that contingent liabilities associated with PPPs, although they may be important in the context of a project, are usually small in comparison to some of the government's other ordinary and contingent liabilities.

Analysis

South Africa's process for developing possible PPPs involves several kinds of analysis relevant to the management of contingent liabilities.

Cost-benefit analysis. The PPP manual (module 4, p. 40) notes that “[a]n economic valuation may be warranted in: greenfield projects, capital projects, and projects that warrant an analysis of externalities (such as major rail, port, airport projects).” It also refers to the Public Finance Management Act 1989, which requires the head of a government agency to ensure that the agency has “a system for properly evaluating all major capital projects prior to a final decision on the project” (sections 38.1 and 51.1). The PPP manual does not describe the requirements of an economic valuation in detail, and cost-benefit analysis is apparently not well developed in South Africa (Jenkins 2008, 16). But the PPP manual states that an economic evaluation should, among other things, achieve the following:

“Give a clear economic rationale for the project.

Identify and quantify the economic consequences of all financial flows and other impacts of the project.

Detail the calculation or shadow prices/opportunity costs for all inputs and outputs, including: foreign exchange; marginal cost of public funds; opportunity cost of public funds (discount rate); high, medium and low skill labour; tradable and non-tradable inputs; tradable and non-tradable outputs (including consumer surplus, where relevant, based on financial or other model quantities).

Identify an appropriate ‘no-project’ scenario and calculate the associated economic flows, treating them as opportunity costs to the project

...

Provide a breakdown of the economic costs and benefits of the project into its financial costs and benefits, and various externalities.

Do a detailed stakeholder analysis, including the project entity, private sector entity, government, and others. (*Government of South Africa. 2004b, 40*)”

Comparison of public and private financing. As part of the feasibility study required for Treasury Approval I, departments considering a PPP must compare the costs and benefits of a PPP with the costs and benefits of a publicly financed project. The PPP manual (module 4) provides detailed guidance on the nature of the required analysis. Its approach is similar to, and partly based on, practice in Australia and Britain. Departments must specify the outputs they want from the project and then estimate the costs of a “PPP reference model” and a “public sector comparator.” The manual underlines the fact that

An institution cannot have definitively chosen a PPP before it has done the feasibility study. A PPP is still just a possible procurement choice and must be explored in detail and compared with the possibility of delivering the service through a conventional public sector procurement. (*Government of South Africa 2004b, 1*)

Quantification of contingent liabilities. In discussing the comparison of the costs of a PPP and the public sector comparator, the PPP manual does not refer to contingent liabilities by name, but it does pay close attention to analysis of risks borne by the government. The estimated costs of both the public sector comparator and the PPP reference model need to include the expected discounted cost to the government of the risks that the government bears.

For the public sector comparator, the idea is that the government bears risk-related costs in a typical publicly financed project that, seldom are quantified. For example, the estimate of the cost of construction may not take full account of the likelihood of delays and cost overruns. The risk-adjusted public sector comparator is intended to remedy this problem by adding to the “base” public sector comparator an estimate of the expected cost overrun. The manual gives a hypothetical example of the expected risk-related costs of a publicly financed hospital. In the example, those expected costs are divided into categories, such as construction-cost overruns, delays, “upgrade costs,” and “operating risk.” Under each heading, the additional risk-related cost of the public project is estimated as the probability-weighted average of the estimated costs associated with each of four or five scenarios. Table 5 reproduces the part of the illustration dealing with construction costs. It is assumed in the table that the base cost of construction is R 100 million.

Table 5. Estimating the Expected Cost of Construction in the Risk-Adjusted Public Sector Comparator in South Africa

	Change in cost relative to base estimate (million rand)	Probability of scenario (%)	Expected cost overrun (million rand)
Below base PSC	-5	5	-0.25
No change from base PSC	0	10	0
Overrun: Likely	15	50	7.50
Overrun: Moderate	30	20	6.00
Overrun: Extreme	40	15	6.00
Total		100	19.25

Source: Government of South Africa 2004b, Module 4, 51.

Note: PSC = public sector comparator.

For the PPP reference model, the idea is that the project company will not bear all the project's risks. Thus, to estimate the full cost of the PPP, it is necessary to estimate not only the costs for which the PPP company will charge but also the additional risk-related costs that the public sector will bear. The manual does not give detailed guidance on what those risks might be or how the expected cost of bearing them might be calculated. But the guidance on estimating the risk-related costs of public provision presumably is relevant.

In the case of the Gautrain, the report for Treasury Approval III included a 50-page report on the contingent liabilities created by the project for the Gauteng province. The report described the liabilities, set out the rationale for the contractual provisions that created the liabilities, and commented on their magnitude. In some cases, the report (justifiably) declined to estimate the probability of payments or their expected value. In others, it quantified the maximum payments and gave rough estimates of expected payments. The analysis of the possible cost of the patronage guarantee, for example, employed Monte Carlo simulation to get a sense of the probability distributions of revenue and the government's payments.

Reporting

Departmental reports. In South Africa, national and provincial government departments report on a modified cash basis. This means that they report cash revenue and cash expenses and a partial balance sheet showing financial assets and liabilities, but not physical assets or liabilities such as those that are sometimes recognized in relation to PPPs. So the issue of whether PPPs are on or off the public sector balance sheet does not arise. But since the 2006 review of the management of the contingent liabilities related to

PPPs, the National Treasury's accounting guidelines for departments require the presentation of a "disclosure note" on PPPs.

For example, the National Department of Trade and Industry (DTI), which has entered into a PPP for office accommodation (appendix 2), includes a two-page note on its PPP in its annual report for 2007–08. The note describes the arrangement in some detail and discloses the payments that DTI has made for the services in each of the last two years, and the basis on which those payments were determined. It does not, however, say anything about contingent liabilities associated with the PPP, such as those relating to contract termination.

The Department of Transport and Public Works of the Western Cape, the public contracting agency for the Chapman's Peak PPP, includes the following note in its 2007–08 annual report.

A concession agreement was concluded for the design, construction, financing, operating, and maintaining of Chapman's Peak Drive as a toll road for 30 years. At the end of the concession period the road is returned to the Provincial Government of the Western Cape in a clearly defined condition. The agreement, which provides for both renewal and termination options, was signed on 21 May 2003. The partnership has been operational since 21 December 2003. However, in terms of Section 21.1.2 of the concession agreement a designated event has been in place since the opening of the toll road. The designated event will remain in place until such time that the Record of Decision for the construction of the permanent toll plazas that was issued on the 3 July 2005 is either confirmed or amended by the Minister of Environmental Affairs and Tourism in response to appeals against the Record of Decision. This ruling is a prerequisite for the transfer of commercial risk to the Concessionaire. Until then, the Province remains responsible for shortfalls in toll income. (*Government of Western Cape*, 2008, 149)

The note includes a table that shows that because of the "designated event,"¹⁷ the department paid the concessionaire R 12.745 million in 2007–08 and R 8.747 million in 2006–07.

In its annual report for 2008, the Gauteng Department of Public Transport, Roads, and Works, the contracting authority for the Gautrain, states that, according to its accounting policies, "A description of the PPP arrangement, the contract fees and current and capital expenditure relating to the PPP arrangement is included in the disclosure notes." But, although the

17. The previous year's annual report added a footnote explaining "designated event:" "In terms of the designated event all toll revenue accrues to the Province; the Concessionaire is paid a fix sum monthly based on the financial base case; the Province is responsible for the construction of the temporary toll structure, additional costs relating to the operation of the temporary toll structure, and escalation in relation to the construction of the permanent toll plaza."

report describes aspects of the Gautrain project, it does not include a disclosure note on PPPs. This may reflect the difficulty of complying with all accounting requirements (the report runs to 424 pages as it is) and the fact that payments under the patronage guarantee have not yet been required.

Plans for accrual accounting. South African government departments may in future adopt modern accrual accounting. New accrual standards already have been produced by the South African Accounting Standards Board (ASB), which generally follows IPSAS. Among other things, the ASB has produced a guideline on accounting for PPPs (ASB 2008; Botha 2009), which follows the approach of IFRIC 12: the public contracting agency must recognize the PPP project's assets, and an associated liability, on its balance sheet if the agency controls the assets.

In addition to formal reporting, the National Treasury regularly publishes a table of PPPs undertaken in terms of Treasury Regulation 16, along with an estimate in most cases of their cost (see appendix 2).

5.

PRACTICES FOR OTHER COUNTRIES

Australia, Chile, and South Africa all have well-regarded PPP programs and none has suffered large losses on PPP-related contingent liabilities. The approaches these countries take to the management of contingent liabilities look reasonable. So it is natural for other countries to look to their experience to see what practices they might adopt.

Caution must be exercised, however, in drawing inferences from just three case studies. Even if we conclude that the three countries are reasonably successful, we cannot be sure how close are the links between their successes and the practices discussed in this report. Among other things, Australia, Chile, and South Africa have enjoyed good economic growth in the last 20 years. Growth increases user-fee revenue and gives the government plenty of tax revenue with which to pay for government-funded PPP services. It means that guarantees are less likely to be called and contracts are less likely to be terminated. Of course, PPP policies in Australia, Chile, and South Africa may have contributed to economic growth; Chile's PPPs, for instance, may have allowed big investments in valuable infrastructure that the government would not have made itself. But PPP policies are at most one of many influences on economic growth.

Moreover, even if we knew what worked in Australia, Chile, and South Africa, we would not necessarily know what would work in other countries. Some of the probable causes of success in the three countries studied here are hard to export to other countries. Australia has high per capita income (see table 6, which also summarizes the approaches of three countries to the management of PPP-related contingent liabilities). Compared with other developing countries, Chile and South Africa have clean, competent, and accountable public sectors. Each of the three countries is in the top half of

the World Bank's 2007 country rankings on each of six indicators of the quality of public sector governance. Chile and Australia are near the top of many rankings.¹⁸ Creating a clean, competent, and accountable public service is harder than creating a PPP unit with skills in the analysis of contingent liabilities, but it is probably more conducive to good management of contingent liabilities.

Despite these difficulties, we can discuss the practices that other governments might consider adopting.

Table 6. The Three Jurisdictions and Their Approaches Compared

	Chile	South Africa	Victoria
Gross national income in billion U.S. dollars (per capita in thousand U.S. dollars), 2008 ^a	136 (8,190)	278 (5,720)	186 (35,760)
Percentile rank ^b			
Voice and accountability	77	69	93
Political stability	66	51	79
Gov't effectiveness	86	75	97
Regulatory quality	91	66	96
Rule of law	88	57	95
Control of corruption	90	67	95
Tiers of government undertaking PPPs	Mainly national	National, provincial, and municipal	Mainly state
Nature of PPPs	Mainly user-fee funded roads and airports, some government-funded projects as well	Mix of user-fee funded projects (e.g., toll roads) and government-funded projects	Mix of toll roads and other mainly government-funded projects

18. See <http://info.worldbank.org/governance/wgi/index.asp>.

	Chile	South Africa	Victoria
Major contractual contingent liabilities	Most toll-roads and airport concessions have revenue guarantees. Contract renegotiation has led to large unplanned expenditures, though often as a result of changes in the required scope of work.	Main contingent liabilities are to compensate contractors for early contract termination, including for force majeure and contractor default. Also some revenue guarantees.	Government risk-bearing is more limited than in Chile and South Africa and mostly relates to risks the government can control.
Main central location of PPP expertise	Concessions group in Ministry of Public Works	PPP group in National Treasury	PPP group in Department of Treasury and Finance
Approval	Minister of finance must approve concession contract. Minister is advised by a Contingent Liabilities and Concessions Unit. But most PPP expertise resides in the Concessions Department of the Ministry of Public Works.	Proposed PPPs and thus associated contingent liabilities must be approved at four stages by the National Treasury, which contains a specialist PPP unit. The Treasury's fiscal liability committee reviews at fourth stage.	PPPs must be approved at four stages by the Cabinet, which is advised by the Department of Treasury and Finance, which has a PPP group.
Analysis	Ministry of Finance measures and values revenue guarantees for existing and proposed concessions.	Approval of Gautrain project was based on a 50-page report that analyzed many associated contingent liabilities, some small, others large.	PPP guidelines focus on estimating the expected costs of uncertain payments in publicly financed projects in comparisons between the costs of a PPP and a publicly financed project.

	Chile	South Africa	Victoria
Reporting	Government agencies include a disclosure note on PPPs in their modified-cash-based annual reports.	Government agencies include a disclosure note on PPPs in their modified-cash-based annual reports.	Government reports according to IFRS. Most PPP assets and associated liabilities are on the government's balance sheet. Contracts are published.

Source: Authors' compilation.

Note: PPP = public-private partnership.

a. National income is by atlas method. Per capita income for Victoria is for Australia as a whole.

b. Percentile rank is the percentage of countries worldwide that rate below the selected country. Higher values indicate better governance.

Approval

One policy that is likely to be sensible in most countries is to have the Ministry of Finance review all proposed PPPs before they are signed. In all three of the countries under review, someone other than the line minister promoting a PPP must approve the PPP before it is undertaken, and in all three countries, that decision maker is advised by a group in the Ministry of Finance with expertise in PPPs. For review by the Ministry of Finance to be effective, the decision whether to proceed with a PPP must involve either the ministry or a body, such as the cabinet, that is interested in the recommendation of the Ministry of Finance.

But exactly how the Ministry of Finance should be involved may vary from country to country. In Chile, the major source of PPP expertise resides in the Ministry of Public Works, and the Ministry of Finance has only a three-person team working on the issues. In Victoria and South Africa, the Ministry of Finance is the major central source of expertise on PPPs, although contracting agencies that have undertaken many PPPs tend to be the experts in their particular field. Each approach has advantages and disadvantages.

In Chile, concerns have been raised that the Ministry of Finance has the chance to intervene in the development of a concession only when it is too late to propose major changes without serious disruption of the investment program. Similar concerns arise in Indonesia, where PPPs are developed by line ministries and then reviewed by a risk-management unit in the Ministry of Finance. The risk-management unit tends to get involved relatively late in the process of PPP development, leaving it with the choice

of acquiescing to a poorly designed PPP or objecting and thus being seen as a naysayer that stops badly needed investment.¹⁹ Such problems are less likely if the Ministry of Finance houses an expert PPP unit that gets involved early in project development.

Moreover, managing PPP-related contingent liabilities requires skills not only in finance and quantitative analysis but also in the design of infrastructure projects. PPP-related contingent liabilities have similarities to financial guarantees, and the techniques used to value financial guarantees and other options can be used to value these liabilities. Some aspects of the management of financial guarantees are relevant to the management of PPP-related contingent liabilities.²⁰ But an understanding of PPP-related contingent liabilities also requires an understanding of the details of PPPs and infrastructure projects. Consider, for example, the contingent liabilities related to rock falls on Chapman's Peak Drive or unmapped gas pipelines in Santiago or the question of exactly which risks in a Melbourne toll-road project are under the control of the government. Chile's Contingent Liabilities and Concessions Unit has a strong understanding of PPPs (some of its staff have worked in the concessions unit in the Ministry of Public Works). But it is easier to ensure such understanding if responsibility for the management of PPP-related contingent liabilities is grouped with responsibility for other aspects of the management of PPPs.

But Chile's approach has advantages of its own. PPP units, wherever they are located, tend to like PPPs. One of their functions indeed may be to promote the use of PPPs. They therefore may be less than vigilant in limiting contingent liabilities. That problem is avoided by separating the main center of PPP expertise from the review of contingent liabilities and other fiscal implications. Also, because one group in Chile's Ministry of Finance is responsible for monitoring a wide range of contingent liabilities, the attention given to each kind of contingent liability can be tailored easily to its significance.

There are, however, other ways to ensure that the Ministry of Finance's review is expert and impartial. Review of PPPs in South Africa now involves a liability committee that includes people in the National Treasury outside

19. Although it does not discuss Indonesia's most recent efforts to manage contingent liabilities associated with PPPs, Wells and Ahmed (2006) is an excellent account of Indonesia's experience in the 1990s with independent power projects (PPPs by another name). Although it does not expressly refer to the management of contingent liabilities, it vividly describes the reality of a government's response to claims by investors for compensation in the wake of the Asian crisis, which crippled many of the projects. Among other things, it points to the problems that arise when the public sector is not as clean, competent, and accountable as those of Victoria, Chile, and South Africa.

20. Merton (1977) shows that guarantees can be valued as options. Merton and Bodie (1992) provide an excellent discussion of the management of financial guarantees.

the PPP unit. In New Zealand, a National Infrastructure Unit recently has been created within the Treasury. One of its roles is to provide “support and guidance to government agencies in the preparation of PPPs,” which have been little used in New Zealand to date. Its responsibilities are not limited to projects carried out by means of PPPs, however, so it may be less vulnerable to a bias in favor of PPPs.

The appropriate scope of the Ministry of Finance’s role probably depends on the circumstances. For example, if the government wants to expand the use of PPPs rapidly (as perhaps in Indonesia), a PPP unit in the Ministry of Finance with wide-ranging responsibility may be helpful. On the other hand, if most PPPs are in a single sector, and are well understood by the relevant sector ministry, the Ministry of Finance might appropriately play a smaller role, as in Chile. If information flows freely between people in different ministries, line ministries have incentives to control costs, and ministers collectively make major decisions about projects, it may not much matter how expertise is distributed between the Ministry of Finance and other agencies.

Lastly, it is worth highlighting the advantage of the requirement in Victoria that departments get budget funding for a publicly financed project before a decision is made whether to undertake the project as a PPP. This technique avoids the fiscal illusion in which PPPs seem free and publicly financed projects seem expensive. In Victoria, the technique is used only for government-funded PPPs (for example, a road with shadow tolls) and not for user-fee PPPs (a road with real tolls). But because user-fee-funded PPPs also create fiscal illusions, the technique may be useful for all PPPs.

Analysis

Chile stands out for routinely updating and publishing estimates of the risks and costs created by PPP-related contingent liabilities. But it is not unique in developing and maintaining sophisticated measurement techniques. Colombia has measured the risks of PPP-related contingent liabilities since the late 1990s (Lewis and Mody 1997; Government of Colombia n.d.). Governments in Australia and South Africa do some sophisticated quantitative analysis behind the scenes.

Should countries with limited administrative capacity attempt similar quantification? Quantifying contingent liabilities requires skills that not all ministries of finance have, at least in abundance. So ambitious attempts at quantification can run into problems. With the help of consultants, Turkey developed a sophisticated model for measuring the risks created by government guarantees for energy projects, but Jenkins (2008) reports that the government has let the model fall into disuse. It now uses only a simpler (less powerful) credit-scoring model for the limited purpose of estimating the likelihood of default in the next year.

The appropriate amount of quantification depends in part on the nature of the contingent liabilities. Chile has two dozen concessions with revenue guarantees that, in sum, create sizeable fiscal risks. Whether these guarantees should be offered is also contentious, so the results of the quantification could change the decision whether to offer them. In addition, the revenue guarantees are similar enough to each other to create economies of scope in measurement and valuation: once you have quantified one revenue guarantee, you do not have to do much more work to quantify the next. Measuring and valuing guarantees is less likely to be warranted when there are only a few small, diverse PPPs.

But limited administrative capacity by itself is a poor reason for not estimating the cost and risk of a proposed guarantee of a significant risk not under the government's control. The government may have limited analytical resources and other pressing priorities, but an estimate does not always have to be complicated or precise to be useful. And, if the government has no idea of the cost and risks that the guarantee would create, it would do well to get advice from external advisers or to avoid offering the guarantee.

Sometimes, analysis can be simple and still useful. Governments often think of their obligations in PPPs as creating only contingent liabilities, but sometimes it is simpler, and equally legitimate, to think of them as creating ordinary liabilities (and assets). In much of East Asia, the biggest PPPs are electricity-generation projects in which an independent power producer sells power under a long-term contract to a state-owned electricity utility. To protect investors, the contract typically requires the utility to pay for available power, whether or not the utility happens to need energy. Governments are asked to guarantee the payments of the state-owned utility and they may in any case feel obliged to ensure that an important state-owned utility can meet its obligations. The express or tacit guarantees can be thought of as creating a contingent liability for the government, and analysts can estimate the cost and risks of the guarantee, using a stochastic model of the utility's finances. But if the government owns and controls the utility, and is expressly or tacitly liable for its obligations, the utility's assets and liabilities can be considered assets and liabilities of the government. Analysts can then ignore the guarantee: The central question is whether the government should assume the obligations to the independent power producer in return for the power. Are the benefits of the power greater than its cost? Is it cheaper to procure the power in this way or by using traditional public finance? Is it prudent for the government to assume more liabilities?

Cost-benefit analysis of projects and comparison of the costs of PPPs and publicly financed projects provide useful information for decision makers and can help ensure that PPP-related contingent liabilities are incurred only for

good projects. They, too, are useful only to the extent that they may influence decisions: If the decision to use a PPP has effectively been made before the comparative analysis of cost is undertaken, the value of the analysis is limited. Even then, however, the analysis may influence the design of the project and inform the management of contingent liabilities associated with it.

At least as important as quantitative analysis is good qualitative analysis based on common sense, economic and other theory, and a knowledge of standard practice (as well as a willingness to challenge standard practice). In this case, the involvement of expert PPP units and the development of guidelines and standardized contractual terms are useful. Moreover, involving the Ministry of Finance in this analysis should help ensure that possible future fiscal costs are properly considered.

Reporting

Chile's quantitative analysis of contingent liabilities leads to extensive reporting, but perhaps the most interesting additional issue raised by the practices of the three countries under the heading of reporting is Australia's adoption of modern accrual accounting.

Modern accrual accounting generates useful information about PPPs and reduces the incentive to use them for the purpose of fiscal disguise. Annual financial reports may be more potent than ad hoc reports on PPPs because they are salient and audited. Additionally, the government cannot decide to stop preparing the reports when the information becomes inconvenient. If the reports are prepared according to recognized international accounting standards, they have added credibility.

Yet introducing modern accrual accounting is a major reform, the merits of which depend on many more factors than its effect on a PPP program. Despite the influence of accounting on government behavior, governments that struggle to perform basic functions have more pressing tasks than to introduce accrual accounting. Even South Africa, which has a competent public sector and many accountants well versed in IFRS, is not rushing to adopt modern accrual accounting for the government.

The use of primitive accounting, however, does make governments much more susceptible to the temptation to use PPPs irrespective of their real benefits. The illusions created by flawed accounting are hard to resist during the best of times. Governments that have incurred large debts as a result of the financial crisis will be more tempted than usual to assume liabilities that their accounting fails to recognize.

To reduce that temptation, governments can introduce routine reporting of additional information on PPPs. Such reporting might include a table that lists every signed PPP, along with a description of the project, an estimate of

its capital cost, and a description of the government's financial obligations. For government-funded PPPs, the schedule of committed payments can be shown. In the United Kingdom, where most PPPs are government funded, the government posts a spreadsheet online that does just this. It would be simple to estimate the present value of the payments. For user-fee funded PPPs, in which the government does not plan to make any payments, the report can describe the events that would require the government to make payments and specify the maximum payment that could be required, in cases in which that amount is known. To take a simple example, if the government has guaranteed debt of the PPP company, it can state the amount of debt that it has guaranteed. If it has guaranteed that the PPP company will receive a certain amount of revenue, it can disclose those guaranteed amounts. Sometimes, the government also may be able to disclose estimates of the expected value of certain payments and estimates of the risks surrounding those payments (such as cash flow at risk). South African government agencies' disclosure notes on PPP and Chile's reports on public finances and on contingent liabilities illustrate the possibilities.

Lastly, publishing signed PPP contracts, as in Australia and Chile, is an easy way to create transparency. Any government with a Web site can follow such a practice. To ensure full transparency, all contractual agreements, including amendments should be published. Draft contracts might also be published to give interested parties an opportunity to comment on them.

APPENDIX 1.

CHILEAN MINISTRY OF FINANCE'S MEASUREMENT AND VALUATION OF GUARANTEES

The Ministry of Finance in Chile uses a spreadsheet model to quantify the fiscal implications of the revenue guarantees and revenue-sharing arrangements (and, when they were in force, the exchange-rate guarantees). The model has three main parts. The first is a model of the guarantee-related provisions of the concession contracts. The second is a stochastic model of traffic revenue (that is, a model that allows traffic revenue to evolve with a random as well as a predictable element). Together, the first two parts generate estimates of the probability distributions of the government's future payments and receipts. The third part of the spreadsheet values the guarantees and revenue-sharing arrangements.

The first part of the model essentially translates the clauses of a concession contract concerned with revenue guarantees and revenue sharing into formulas in a spreadsheet. The essence of the revenue guarantees is simple: if actual traffic revenue exceeds the guaranteed level, the government pays nothing; otherwise, it pays the difference between actual and guaranteed traffic revenue. The guarantee thus can be modeled by using "if-then" or maximum functions. Some of the revenue-sharing, or more accurately profit-sharing, provisions are more complicated. The model simplifies aspects of the contracts. For example, in some concessions, the government's payments under the revenue guarantee depend on the number of traffic accidents, and this dependency is ignored in the model.

The second part of the spreadsheet is a model of traffic revenue for each of the roads and airports with revenue guarantees. Over the years, different

approaches have been tried. Some have analyzed revenue as the product of traffic and tariffs for various types of vehicle (cars, motorcycles, light trucks, and so on) and allowed different types of traffic to respond differently to changes in the economy. Some have analyzed traffic revenue as a function of gross domestic product (GDP) and the price of petrol and have used stochastic models of the evolution of these underlying variables.

The current approach is simpler: It projects traffic revenue directly. For each concession in operation, the projection starts with actual revenue from the previous year. Estimates of expected growth may come from traffic forecasts, if they are recent and considered useful, or from forecasts of GDP and an estimate of the income elasticity of traffic revenue. Randomness is incorporated by assuming that traffic revenue evolves as a kind of random walk, namely, a geometric random walk with drift (growth). The geometric aspect of the random walk means that rates of growth and volatility of revenue are assumed to be proportional to current revenue. The expected growth rate can change from year to year, as well as differing from concession to concession. The rate of volatility is assumed to be the same for all years and all roads—although it would be easy to change this assumption if differences were evident. The main source of the estimate of volatility is historical variation in revenue on roads that have been open for a few years. A rough estimate of the correlations among the revenues on different roads is incorporated in the model. Chile's concessions have been operating for many years, and public toll roads existed before concessions, so historical data are plentiful. Of course, the future will not be the same as the past, and the estimates of volatility, correlations, and growth rates are rough.

For roads that have not yet been opened to traffic, initial revenue is treated as a random variable. The random variable is assumed to have a lognormal distribution, which means that initial revenue cannot be negative (something that would be possible if it were normally distributed). To account for optimism, the mean of the random variable is allowed to be lower than forecast of revenue prepared when the concession was developed. Estimates of optimism and of the standard deviation of initial revenue also can be informed by historical experience in Chile, as well as international research, such as Skamris and Flyvbjerg (1997) and Standard & Poor's (2003).

The two parts of the spreadsheet model just described estimate the frequency distribution of payments by and to the government in each future year of each concession. They generate the graphs in figure 2. In some cases, the frequency distributions can be estimated analytically (that is, with a formula that can be entered in a cell of a spreadsheet). But most estimates are derived from Monte Carlo simulation.

The third part of the spreadsheet estimates of the value of the government's right to receive possible revenue-sharing payments and its obligation to make possible guarantee payments. This part generates the values of revenue guarantees shown in table 4. A simple way to estimate these values would be to compute the sum of expected payments discounted at an estimate of the risk-free borrowing rate. Given the uncertainty inherent in estimates of future rates of growth and volatility, this simple approach would not be unreasonable. But it would tend to undervalue guarantees and overvalue revenue-sharing arrangements, and make the concessions seem less costly and risky to the government than they really are. Revenue guarantees are more likely to be triggered when the economy is doing poorly and revenue-sharing payments are more likely when it is doing well. Rights and obligations that have these characteristics should have values that differ from the sum of expected payments discounted at the risk-free rate. In particular, rights to payments that usually are received when the economy is doing badly are worth more than rights to payments that usually are received when it is doing well. This, at any rate, is the idea underlying standard models of the price of risk.

The spreadsheet model uses the capital-asset pricing model (CAPM) to price the risk of revenue guarantees and revenue-sharing arrangements. In particular, it uses a rough estimate of a parameter closely related to the CAPM beta of security valuation. That parameter is used to generate projections of risk-adjusted revenue. Those projections generate estimates of risk-adjusted expected payments, or certainty equivalents. The certainty equivalents then are discounted at the risk-free rate to get present values.

APPENDIX 2.

TABLE OF SOUTH AFRICAN PPPs

Project	Contracting government agency	Year of financial closure	Term (years)	Estimated present value of government payments (million rand)	Capital value or other measure of cost (million rand)
N4 East Toll Road	National Roads Agency	1997	30	..	3,000
N3 Toll Road	National Roads Agency	1999	30	..	3,500
Bloemfontein and Louis Trichardt prisons	Department of Correctional Services	2000/2001	25	..	..
SANParks concessions	SANParks	2001–02	20		
Inkosi Albert Luthuli Hospital	KwaZulu Natal Department of Health	2001	15	4,500	..
Ecotourism	Limpopo Department of Finance, Economic Affairs, and Tourism	2001	30	..	..

Project	Contracting government agency	Year of financial closure	Term (years)	Estimated present value of government payments (million rand)	Capital value or other measure of cost (million rand)
Universitas and Pelonomi Hospitals	Free State Department of Health	2002	16.5	..	..
N4 West Toll Road	National Roads Agency	2001	30	..	3,200
Information systems	Department of Labour	2002	10	1,500	..
Chapman's Peak Drive toll road	Western Cape Department of Transport	2003	30	..	450
State Vaccine Institute	Department of Health	2003, extended 2009	4	..	..
Humansdorp District Hospital	Eastern Cape Department of Health	2003	20	19	..
Fleet management	Eastern Cape Department of Transport	2003	5	553	..
Head Office Accommodation for Department of Trade and Industry	Department of Trade and Industry	2003	25	870	..
Cradle of Humankind Interpretation Centre Complex	Gauteng Department of Agriculture, Conservation, Environment, and Land Affairs	2003	10	..	..

Project	Contracting government agency	Year of financial closure	Term (years)	Estimated present value of government payments (million rand)	Capital value or other measure of cost (million rand)
Social Grant Payment System	Free State Department of Social Development	2004	3	260	..
Gautrain Rapid Rail Link	Gauteng Department of Public Transport, Roads, and Works	2006	20		23,090
National Fleet Management	Department of Transport	2006	5	213	919
Western Cape Rehabilitation Centre and Lenteguur Hospital		2006			334
Polokwane Hospital Renal Dialysis		2006	10	88	
Head office accommodation for Department of Education	Department of Education	2007	27	707	512
Port Alfred and Settlers Hospital	Eastern Cape Department of Health	2007	17	275	169
	Western Cape Nature Conservation Board		30		40

Project	Contracting government agency	Year of financial closure	Term (years)	Estimated present value of government payments (million rand)	Capital value or other measure of cost (million rand)
Fleet services	Northern Cape Department of Transport, Roads, and Public Works		5		342
Total				7,883	10,150

Sources: Government of South Africa. 2000–2009; Gqoli 2005.

Note: The list is not exhaustive. As of May 4, 2008, \$1 dollar was worth 8.39 rand. In 2008, South African GDP at market prices was reported to be R 1,271,717 million (www.statssa.gov.za).

For the toll roads, year of financial closure is assumed to be year of contract signature.

.. = negligible.

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