

INTERNATIONAL MONETARY FUND

Government Guarantees and Fiscal Risk

Prepared by the Fiscal Affairs Department
(In consultation with other departments)
Approved by Teresa Ter-Minassian

April 1, 2005

Executive Summary	3
I. Introduction.....	4
II. Guarantees, Contingent Liabilities and Government Obligations	4
III. The Public Policy Purpose and Design of Guarantees.....	7
IV. Problems Associated with Guarantees.....	9
V. Fiscal Accounting and Reporting.....	11
A. Approaches to Valuing Guarantees.....	11
B. Accounting for Guarantees	13
C. Disclosure Requirements for Guarantees.....	15
VI. Managing the Fiscal Risk Posed by Guarantees	17
A. Direct Control of Guarantees	17
B. Budgeting for Guarantees	19
C. Guarantee Fees.....	22
D. Institutional Development.....	23
VII. The Consequences of Guarantees for Debt Sustainability.....	23
VIII. Concluding Comments.....	26
Tables	
1. Government Obligations by Degree of Certainty	6
Boxes	
1. Comprehensive Disclosure Requirements for Guarantees	16
2. Management Framework for Loan Guarantees in Canada	18
3. Budgeting for Contingent Liabilities in Colombia	21

4. Budgeting for Loan Guarantees in the United States.....	21
Appendices	
I. Modeling and Estimating the Value of Government Guarantees in Chile	28
II. International Accounting and Reporting Standards for Contingent Liabilities.....	32
References.....	36

EXECUTIVE SUMMARY

Uncertainty surrounding the fiscal implications of government guarantees makes the disclosure of information about guarantees, and about other contingent liabilities of government, a good fiscal transparency practice. While this paper pays considerable attention to accounting and reporting issues raised in connection with the quest for transparency, guarantees raise a wider set of issues which are also addressed. The focus is mainly on guarantees provided in connection with infrastructure projects undertaken by public-private partnerships.

Guarantees are a legitimate form of government support for infrastructure investment when the government is best placed to anticipate risk, control risk exposure, and thereby minimize the cost of risk. However, guarantees create problems insofar as they are not usually subject to the same degree of scrutiny through the budget process as regular spending. These problems are compounded by the fact that guarantees can often have potentially significant fiscal consequences, and these can be particularly severe if they are exposed during crises. This places a premium on developing a rational, forward-looking policy towards guarantees, for which transparency is a precondition.

The main accounting and reporting challenge is that the contingent nature of guarantees makes valuing them difficult. However, a number of analytical techniques are available to value guarantees, and some of these have been used successfully by the Chilean government to determine the expected longer-term costs of guarantees provided to operators of highway and other concessions. Under cash accounting, guarantees are recorded in the fiscal accounts when a covered contingency occurs and a cash payment is made; under accrual accounting, expected costs should be reflected in the fiscal accounts at the time a guarantee is granted. That said, transparency with respect to guarantees under any basis of accounting can be strengthened by disclosing supplementary information in budget documents, fiscal reports and financial statements. In this connection, the paper proposes a set of comprehensive disclosure requirements for guarantees.

The potential fiscal costs associated with guarantees argue in favor of carefully controlling them with a view to managing fiscal risk. Centralized controls over the granting of guarantees are often appropriate, and a government wishing to assert firm discipline should consider introducing a quantitative ceiling on guarantees. Governments should also appropriate in their annual budgets the expected cost of payments to meet called guarantees in the next year. In addition, where reasonably reliable estimates of the future expected cost of guarantees can be made, governments should reflect this in the budget when guarantees are granted. While this will require an appropriation, funds do not have to be set aside or earmarked to meet the full expected cost of guarantees. Charging fees to beneficiaries can help to control guarantees.

Debt sustainability analysis should take into account guarantees. However, the uncertainty created by guarantees is a significant source of complication. While sophisticated approaches to assessing debt sustainability under uncertainty are being developed, such as measuring Value-at-Risk (VaR), scenario analysis would be a practical first step.

I. INTRODUCTION

1. **The March 2004 Board paper on Public Investment and Fiscal Policy (SM/04/93) notes that government guarantees provided in connection with public-private partnerships (PPPs) are a major source of fiscal risk.** The disclosure of information about guarantees is therefore a good fiscal transparency practice. That said, the appropriate way to reflect the financial impact of guarantees in the fiscal accounts is unclear. This being the case, and recognizing that increasing use of PPPs to expand public infrastructure could impose longer-term costs on government that adversely affect debt sustainability, the above-mentioned Board paper indicated that the staff would prepare a follow-up paper on the fiscal treatment of government guarantees and other contingent liabilities of government.

2. **This paper, however, looks beyond fiscal treatment in a narrow accounting or statistical sense, and addresses a wider range of fiscal issues raised by guarantees.** Thus Section II places guarantees and other contingent liabilities in the context of the government's broader obligations. Section III then addresses the public policy purpose and design of guarantees, while Section IV outlines the problems associated with guarantees. Following a discussion of fiscal accounting and reporting in Section V, Section VI turns to managing the fiscal risk posed by guarantees, and Section VII examines the consequences of guarantees for debt sustainability. Concluding comments are provided in Section VIII. Appendices cover modeling and estimating the value of guarantees in Chile, and international accounting and reporting standards for contingent liabilities.

3. **While specific references in the paper are mainly to guarantees provided in connection with PPPs, much of the discussion is relevant to a wider range of guarantees and to other contingent liabilities.** But at the same time, some of the latter guarantees and contingent liabilities raise issues that are not covered in the paper. This is especially the case with government support to the financial sector and its response to natural disasters, which warrant separate consideration. For a discussion of some of these issues, see Brixi and Schick (2002).

II. GUARANTEES, CONTINGENT LIABILITIES AND GOVERNMENT OBLIGATIONS

4. **It is important to clarify at the outset some terminology that is used throughout the paper.**

- A *government guarantee* legally binds a government to take on an obligation should a clearly specified uncertain event materialize. Thus with a loan guarantee, the government will be committed to making loan repayments on behalf of a non-sovereign borrower that defaults. Governments provide a number of loan guarantees (e.g., to farmers, small businesses, home buyers, and students) and other financial guarantees, including trade and exchange rate guarantees, income, profit and rate of return guarantees, and minimum pension guarantees. Guarantees are a common

feature of PPP contracts and other purchase arrangements between the government and the private sector.

- A guarantee is a broader set of obligations of government that gives rise to an *explicit contingent liability*. Beyond guarantees, such obligations arise mainly from government insurance schemes, including deposit, pension, war-risk, crop and flood insurance, but they can also be the result of warranties and indemnities provided by the government, and outstanding and potential legal action against the government. It should be noted that pension and social security obligations of the government (as distinct from guaranteed minimum pensions under private pension schemes or government insurance of pension savings) are not contingent liabilities. While these are contingent for individuals given uncertain life expectancy, aggregate pension and social security obligations can be measured with some precision.
- An *implicit contingent liability* arises when there is an expectation that the government will take on an obligation despite the absence of a contractual or policy commitment to do so. Such an expectation is usually based on past or common government practices, like providing relief in the event of uninsured natural disasters and bailing out public enterprises, public financial institutions, subnational governments, or strategically important private firms that get into financial difficulties. The government may also be expected to cover some costs that are extraordinary (e.g., those related to war reparations, and national reconciliation and reunification).¹

5. **A defining characteristic of guarantees and other contingent liabilities is uncertainty.** It is the uncertainty as to whether the government will have to pay, and if so the timing and amount of spending, that is the principal source of the problems guarantees and other contingent liabilities pose for accountants and statisticians, and for fiscal management. In this regard, they differ somewhat from government debt, for which interest and amortization payments are clearly specified. However, most government obligations have elements of uncertainty, including government debt which has floating rates or is denominated in foreign currency. Table 1 attempts to characterize the range of government obligations by reference to their degree of certainty, and provides examples of different types of obligation.² The more certain an obligation is, the more likely it is that it will meet recognition criteria established by accountants and followed by statisticians, and thus be recorded as a liability in the government's budget documents, within-year fiscal reports, and end-year financial statements. Table 1 also summarizes the treatment of different types of obligation under international accounting and statistical standards.

¹ An obligation arising from an expectation that the government will behave in a particular manner is more generally referred to as a *constructive obligation*, although this term can usefully be restricted to the government's obligation to continue ongoing policies (as distinct from those triggered by uncertain events).

² For further discussion of the way different obligations of government are characterized, see Heller (2004).

Table 1. Government Obligations by Degree of Certainty ^{1/}

Nature of obligation	Obligations with fixed timing and amounts	Obligations with fixed amounts, but uncertain timing	Obligations with estimated timing and amount	Obligations under mutually unexecuted contracts	Constructive obligations	Explicit contingent obligations	Implicit contingent obligations
Example of obligation	Debt instruments; invoiced accounts payable.	Uninvoiced accounts payable; payment arrears.	Civil service pensions; some guarantees; ^{2/} decommissioning costs.	Financial and operating leases; payments under PPP contracts.	Social security schemes; medical benefits for retirees.	Some guarantees; government insurance schemes; warranties and indemnities; legal action against government.	Disaster relief; assistance to public enterprises, public financial institutions, and subnational governments; reunification costs.
Accounting treatment ^{3/}	Recognize as liabilities.	Recognize as liabilities.	Recognize as liabilities.	Recognize financial leases as liabilities; disclose commitments under operating leases; PPPs not covered.	Consideration being given to recognizing some social security obligations as liabilities.	Not recognized; disclose as contingent liabilities.	Not covered.
Statistical treatment ^{4/}	Liabilities.	Liabilities.	Rights accrued under civil service pension schemes are liabilities; guarantees are not liabilities; decommissioning costs offset assets.	Financial leases reported as liabilities; commitments under operating leases reported as a memorandum item. PPPs not covered.	Present value of social security pensions reported as a memorandum item.	Report as a memorandum item.	Not covered.

^{1/} This table adapts the private sector framework provided in Exhibit 9.1 of Stickney and Weil (2000). Moving left to right in the table indicates increasing uncertainty.

^{2/} Guarantees that are highly likely to be called.

^{3/} The accounting treatment referred to in the table is taken from International Accounting Standards and International Public Sector Accounting Standards.

^{4/} The statistical treatment referred to in the table is taken from the *Government Finance Statistics Manual 2001*.

III. THE PUBLIC POLICY PURPOSE AND DESIGN OF GUARANTEES

6. **Guarantees are a form of government intervention intended to alter the incentives faced by the private sector and other public sector entities.** As such, their general motivation derives from market failure, tempered as usual by concerns that inappropriate or excessive intervention can lead market failure to give way to government failure. However, government intervention can take a variety of forms apart from guarantees, and the general principle guiding the type of intervention should be that it is appropriate to the source of market failure and what the government is aiming to achieve through intervention. For instance, if the government's objective is to promote an activity characterized by positive externalities (e.g., education or health care), or to assist poor consumers of a particular service (e.g., local transportation), in most cases a targeted subsidy will work best. Irwin (2003) discusses the circumstances under which particular instruments of government intervention—subsidies, in-kind grants, tax breaks, capital injections, and guarantees—should be used in connection with infrastructure projects. In the case of guarantees, it is noted that they can be an effective response to the inability of markets to distribute risk optimally, although in practice guarantees are used in a much wider range of circumstances.³

7. **In general, risk should be borne by those who are best placed to manage it, in the sense of being able to anticipate risk, control risk exposure, and thereby minimize the cost of risk.** The private sector is clearly in a stronger position to anticipate many project risks, and in particular the *construction and operating risks* that typically characterize PPP projects. It also has a range of options when it comes to controlling these risks, including diversification and insurance. At the same time, there are risks that the private sector cannot control, and which cannot be diversified away or insured against. When the government can control risks, it makes sense to shield the private sector from such risks. *Political and policy risks*—which, among other things, arise from the ability of the government to appropriate property, exert control over entities it owns, and amend laws and regulations—fall into this category. However, some political risks, such as war and civil unrest, cannot be controlled by the private sector or in most cases the government, yet they should not be borne by the private sector alone.

8. **Some guarantees can be viewed as a response to the heavy costs that political and policy risks may impose on the private sector.** This is especially the case under PPP contracts, because they usually relate to the provision of high-cost, single-use, long-lived assets. In the absence of protection against such risks, which could be provided by a single guarantee or a combination of guarantees, the private sector may be unwilling to enter into PPPs and other long-term arrangements with the government. However, the government

³ More specifically, guarantees are often used simply to make projects or activities with significant social returns viable, even though they are not the optimal form of intervention.

should not provide guarantees in respect of all the risks it controls. For instance, it should not compensate for the impact of legal or regulatory changes that apply across the economy or broad sectors of the economy. The focus should be on risks affecting individual projects or groups of similar projects (e.g., the possibility that the government will allow competition in a previously protected market or change pricing policy in a market to a degree that undermines profitability). Moreover, the government should take advantage of opportunities to modify its behavior with a view to containing the impact of the risks it controls. Thus providing for impartial arbitration, regulatory independence, and/or contract renegotiation can lower the probability that guarantees responding to political and policy risks will be called.

9. **There are some risks that neither the private sector nor the government has an obvious advantage in managing.** Natural disaster risk is a case in point, where the commercial availability of catastrophe insurance is likely to determine whether the private sector bears this risk. But other types of risk are more problematic, including *demand risk*, *exchange rate risk*, and *residual value risk*. Demand risk relates to the continued need for a service, and is normally thought of as an operating risk that should be borne by the private sector. However, if the government is the sole provider of a service—which is usually the case with services deriving from social infrastructure and some economic infrastructure—it should bear demand risk. Moreover, if infrastructure such as a toll road is built and operated by the private sector on terms that reflect demand projections made by the government, or on the understanding that a competing road or other means of transportation will not be built, then a case can be made for demand risk to be borne at least in part by the government. It is for this reason that many PPP transportation projects include *minimum revenue* or *income guarantees*. Similarly, while private operators can often hedge their foreign currency exposure, PPP and other projects often include *exchange rate guarantees* where hedging opportunities are limited.⁴ Residual value risk relates to the market price of assets that are typically transferred to the government at the end of PPP contracts. While this is in principle a market risk that could be borne by the private sector, since the government is in many cases the sole potential buyer of assets provided by PPPs, fixed transfer prices are set in PPP contracts which are akin to guarantees.⁵

10. **Efficiency considerations call for guarantees to be limited in scope and duration.** A careful assessment is required of the specific risk concerned to avoid the government providing guarantees that are wider ranging than required to achieve their objective. For instance, demands by a PPP operator for a minimum revenue guarantee may reflect a justifiable concern that a future government will undertake a competing project. However,

⁴ Foreign exchange guarantees are also provided under fixed exchange rate regimes, where the risk is that the exchange rate peg will not hold (e.g., if it comes under a speculative attack).

⁵ This is because contract prices for the assets and services provided by the private sector to the government take into account the transfer price. Whatever the transfer price, as long as it is fixed, the government loses if the asset is worth less than the transfer price and gains if it is worth more than the transfer price.

this source of risk would be better addressed by a guarantee that is triggered should this specific event occur, rather than a minimum revenue guarantee that requires the government to meet revenue shortfalls independently of their cause (which may be partly under the influence of the operator). That said, being too precise in defining covered contingencies could lead to a plethora of guarantees targeting each and every risk faced by a particular project, which might be efficient but could entail considerable administrative cost.

11. **It should also be noted that the need for guarantees can change over time.** For example, governments have often provided extensive and costly guarantees in the early stages of PPP programs.⁶ But over time, as experience accumulates, the policy framework is strengthened, and the uncertainties surrounding the PPP modality are reduced, guarantees can be increasingly confined in scope and greater risk transferred to the private sector. However, there will also come a point, as with any investment program, where a mature PPP program is selecting new projects from candidates that are more marginal in terms of their financial viability. This is more likely to be the case if newer projects have a larger social component, in which case continuing to favor PPPs will probably give rise to renewed requests for guarantees. Of course, the bigger issue is whether PPPs are more efficient in these cases than traditional public investment and government (or contracted-out) service provision.

12. **Whatever the type of guarantee, the private sector should be left bearing some risk at the margin.** Partial guarantees limit moral hazard and adverse selection problems. Deductibles, ceilings on government exposure (e.g. loan guarantees covering only a proportion of loan principal or interest), collateral requirements, delays before compensation is paid, and asserting the seniority of government claims to assets in the event of default are all approaches that help to retain an incentive for the private sector to manage risk efficiently. They also limit the government's overall risk exposure, and ultimately the fiscal impact of called guarantees.

IV. PROBLEMS ASSOCIATED WITH GUARANTEES

13. **While guarantees may be an appropriate form of government intervention, they are not usually subject to the same degree of scrutiny through the budget process as regular spending.** This causes a number of problems.

- It is difficult to verify that a guarantee is the best fiscal policy instrument to use to meet a particular objective, in the sense of being more efficient and cost effective than alternatives.

⁶ For discussion of the experience with infrastructure guarantees in the Asian crisis countries, see Mody (2002).

- The door is open to use guarantees to bypass external or self-imposed fiscal constraints, in which case they can have a hidden and even unintended impact on the stance of fiscal policy (and in particular can be a source of harmful procyclicality).
- Allowance is not usually made in the budget to cover the costs of called guarantees, and little prior consideration is given to the best way to reorient spending or mobilize revenue should this prove necessary to meet these costs.
- A ‘guarantee culture’ is created where the private sector (and in some cases international financial institutions and bilateral lenders) seek guarantees as an alternative to properly managing risk themselves.
- Because guarantees are valuable to beneficiaries and provided at the discretion of government, they can undermine good governance.

14. **These problems are compounded by the fact that guarantees can often have potentially significant fiscal consequences.** This is clearly the case where countries have extended numerous guarantees, as happened in many countries in transition which sought to shift the costs of structural reforms to the future through guarantees (in particular to encourage and support enterprise restructuring).⁷ However, it is implicit contingent liabilities that are potentially the most costly in these countries given an understanding that the government will stand behind privatized firms and financial sectors newly exposed to competition, as they are anywhere that fairly large public (nonfinancial and financial) enterprise sectors are in effect backed by the government. Fiscal costs can also be significant in countries with explicit or implicit deposit insurance, especially if a large bank or a group of banks fails (e.g., as with the U.S. savings and loan crisis), and in federal countries where there is an assumption that the central government will bail out subnational governments that get into financial difficulties (often despite a firm undertaking not to do so).⁸

15. **A further concern is that the fiscal costs of guarantees and other contingent liabilities are often exposed during crises, when the consequences are most severe.** The experience with financial crises in emerging market economies is that different types of crises—currency, banking, and fiscal crises—tend to be triggered by each other. Thus a currency crisis can weaken the banking system, which will receive fiscal support in the form

⁷ Similarly, public enterprises privatized during the 1990s in Argentina were granted revenue guarantees, many of which were called when the economy stagnated.

⁸ European Commission (2004) discusses the fairly extensive guarantees and other contingent liabilities in the new EU member states. Table II.8 in particular provides some quantitative estimates, but these are not comparable across countries. However, a number of countries have explicitly guaranteed debt (and therefore a maximum risk exposure) in the range of 10-15 percent of GDP (Cyprus, Czech Republic, Slovakia), and guaranteed debt is of a similar order of magnitude elsewhere (e.g., India, Thailand). The table also quantifies some other significant contingent liabilities, including the debt of privatized enterprises and decommissioning costs in Lithuania (6¼ and 7 percent of GDP respectively) and reprivatization in Poland (5½ percent of GDP).

of recapitalization; this in turn can compound public debt sustainability problems (which may themselves have been made worse by the currency crisis). This pattern has been seen in a number of crisis countries (see Hemming and Ter-Minassian, 2003), and recapitalization costs have in some instances been very high (e.g., almost 40 percent of 2000 GDP in net terms since 1997 for Indonesia). The upshot is that the government is often forced into a large fiscal adjustment which has to be implemented quickly; however, under such circumstances, institutional impediments can result in some combination of low-quality measures, arrears (including on guarantee payments), and restructuring.

16. **These problems place a premium on developing a rational, forward-looking policy towards guarantees.** The key to promoting such a policy is full transparency about fiscal risks and potential fiscal costs. However, achieving full transparency is hampered by the fact that guarantees and other contingent liabilities pose serious challenges from a fiscal accounting and reporting standpoint.

V. FISCAL ACCOUNTING AND REPORTING

17. **The main accounting and reporting challenge is that the contingent nature of guarantees makes valuing them difficult.** This is one reason why the financial impact of guarantees tends to be recorded in the fiscal accounts only when a guarantee is called. However, even though it is widely acknowledged that the potential cost of guarantees should be taken into account when the decision is taken to provide them, valuation problems are admitted but rarely discussed. Because it is important, this section begins with a discussion of valuation, before turning to the current treatment of guarantees under cash and accrual accounting. It then suggests reporting requirements for guarantees. In what follows, numerous references are made to the statistical reporting framework provided by the *Government Finance Statistics Manual 2001 (GFSM 2001)*.⁹

A. Approaches to Valuing Guarantees

18. **A number of analytical techniques are available to value guarantees.** This section highlights two techniques—Monte Carlo simulation analysis and the Black-Scholes options pricing formula—that model the behavior of the variable which is the underlying source of risk, such as toll revenue in the case of a minimum revenue guarantee, as basis for valuation.

- **Monte Carlo simulation analysis.** The value of the underlying risky variable at any time is assumed to depend on its initial value, the mean and variance of its growth rate, and the value taken by a normally distributed random variable. The probability distribution of guarantee payments for a particular period, and the expected guarantee payment for that period, can be generated by taking a large sample of outcomes for the random variable, and calculating the guarantee payment in each case. The value

⁹ Appendix III of SM/04/93 provides an overview of the *GFSM 2001* statistical reporting framework.

of the guarantee is the discounted present value of expected risk-adjusted guarantee payments over the life of the guarantee.

- **The Black-Scholes options pricing formula.** Guarantees can be thought of as options, in the sense that a guarantee provides the beneficiary with the option to make a claim against the government should some specific event occur. The Black-Scholes formula makes similar assumptions and uses much the same information as Monte-Carlo simulation analysis to price options, and it can also be applied to the valuation of guarantees. Merton (1977) describes how to do this in the case of deposit insurance—where the option can be exercised by depositors should a bank fail—and loan guarantees—where the option can be exercised by a lender should a borrower default. These are both examples of a *put option* that is the beneficiary has the right to sell its claim (to its deposits or to loan repayments) to the government for a specified price.

These techniques are described in more detail in Irwin (2003) and Arthur Andersen (2002).

19. **The choice of valuation technique depends on the structure of a guarantee and the information that is available about the determinants of guarantee payments.** The Black-Scholes formula produces a precise valuation, but can only be used for fairly simple guarantees (and more specifically those that can be exercised once at a specific date). Monte Carlo simulation analysis can be applied to more complex guarantees, but the result is only an approximation. There are of course other techniques that can be applied, including fairly simple numerical methods where expected costs are estimated by applying approximate risk weights to future calls on guarantees, more complicated numerical techniques such as binomial trees (which are referred to in Appendix I), and sophisticated mathematical techniques (such as finite-difference methods). Also, some specific contingent liabilities lend themselves to the application of certain techniques. For example, contingent claims analysis can be used to assess government exposure to balance sheet risks in the corporate, financial, and public sectors.¹⁰ The emphasis on Monte Carlo simulation analysis and the Black-Scholes options pricing formula derives from the recent experience with using them to value guarantees in Chile.

20. **The Chilean government values guarantees provided to operators of highway and other concessions.** Operators are provided with minimum revenue and exchange rate guarantees. Minimum revenue guarantees kick in when toll revenue is below the guaranteed minimum level, but they are partially offset by revenue sharing with the government when toll revenue is above a certain level. The exchange rate guarantee operates symmetrically. The contingent liabilities and assets created by the minimum revenue guarantee and revenue sharing are estimated using Monte Carlo simulation analysis, while the exchange rate guarantee is valued using the Black-Scholes options pricing formula. Estimates are contained

¹⁰ See Gray, Merton, and Bodie (2003) and Gapen and others (2004).

in the *Report on Public Finances*, which is part of the annual budget documentation. The latest estimates are that the net contingent liability (in expected value terms) resulting from the minimum revenue guarantee and revenue sharing is about ¼ percent of 2004 GDP, while the maximum exposure is close to 5 percent of 2004 GDP. The exchange rate guarantee is the source of a very small contingent asset, because the peso has appreciated since the guarantee was offered.¹¹ Further details about modeling and estimating the value of guarantees in Chile, and fiscal reporting of contingent liabilities, are provided in Appendix I.

21. **The Chilean approach to valuing guarantees provided in connection with concessions is presently state-of-the-art.** While some other countries adopt similar techniques, Colombia being notable in this regard, valuation is not the norm, even in advanced economies like Australia and the United Kingdom with sizable PPP programs. Of course, many countries have neither the technical expertise, experience nor information to implement this approach. Indeed, the Chileans have accomplished what they have only with considerable technical assistance from the World Bank. However, there is no reason why many countries cannot make a start with valuing guarantees and other contingent liabilities, even using simple techniques. In this connection, the experience of the Federal Deposit Insurance Corporation in the United States with producing expected loss estimates (which are derived using historical risk weights) is instructive.¹²

22. **It should also be acknowledged that even the Chilean work is still at a developmental stage and has its limitations.** In particular, some concessions have minimum revenue guarantees that do not result in any expenditure when they are called, but instead in an extension to the term of the contract, while beneficiaries have the option to cancel the exchange rate guarantee. Both of these features complicate valuation, and are not taken into account in the Chilean estimates. It should also be borne in mind that the very long time horizon of PPPs can make it difficult to judge the government's risk exposure in countries that have a history of political and economic volatility.

B. Accounting for Guarantees

23. **Under cash accounting, guarantees are recorded in the fiscal accounts when a covered contingency occurs and a cash payment is made.** It is only at this time that the existence of a guarantee will become apparent. The full amount of any payment is recorded

¹¹ The *Report on Public Finances* also provides information on expected cash flows through 2024 under the minimum revenue guarantee, revenue sharing, and the exchange rate guarantee, and under the minimum pension guarantee. The minimum pension guarantee is estimated to be considerably more costly than the guarantees provided to concession operators.

¹² Lithuania has used a similar approach to value loan guarantees provided to private firms.

as expenditure, and the assumption of a loan is recorded as a liability. Future interest and amortization payments are recorded as such.¹³

24. **Under accrual accounting, it is necessary to judge whether a guarantee should be treated as a liability.** As discussed in more detail in Appendix II, international accounting standards require that a contingent obligation should be recognized as a liability only where it is judged more than 50 percent probable that a payment will be made, and that a reasonably reliable estimate of the payment can be made. While many guarantees are unlikely to be called, accounting standards provide that the probability of an expense occurring can be determined by considering a number of similar guarantees as a whole. This makes the calling of at least some guarantees probable. Where a reasonably reliable estimate can be made of the expected cost of called guarantees (that as a group are more than 50 percent likely to be called), governments that prepare their budgets, fiscal reports and financial statements on an accrual basis should recognize the expected cost as a liability at the time guarantees are issued.

25. **Guarantees and other contingent liabilities are formally recognized as a liability by creating a provision.** Under accrual accounting, a provision is used to recognize a liability of uncertain amount and timing when a decision is taken that could lead to a future expense. Creating a provision thus involves recording a liability on the balance sheet and a corresponding expense. However, the term is more often used to refer to the practice of setting funds aside to meet a specific payment when it falls due. But whether to earmark funds to meet future payments is a financial management decision, which is discussed in Section VI, and not an accounting issue. *GFSM 2001* does not cover provisions, because while international accounting standards rely on the likelihood of occurrence as a basis for recognizing contingent obligations, statistical reporting (and *GFSM 2001* in particular) relies mainly on actual events occurring, although it does record some fairly narrowly defined contingencies as liabilities.¹⁴

26. **If a provision is not made for guarantees, they are only recorded under accrual accounting when they are called (as under cash accounting).** When guarantees are called, the treatment under *GFSM 2001* depends on the circumstances. The key determinants are whether the government assumes debt; whether the original debtor is a public or private entity; and whether a claim is acquired against the original debtor. If none of these are the case, guarantee payments are recorded as an expense in the operating statement. If the government assumes the debt of a public entity, the increase in liabilities is either matched by

¹³ If a guarantee fee is charged at origination, this is recorded as nontax revenue. Guarantee fees are discussed in Section VI.

¹⁴ In general, contingent contracts are not recognized as liabilities under *GFSM 2001* because they are not unconditional claims or obligations. Only where a contingent contract relates to a financial arrangement which has value because it is tradable (e.g. a financial derivative) does *GFSM 2001* treat a contingent obligation as a liability.

an increase in equity or the assumption of debt is treated as a loan (if there is documentary evidence that this is indeed the case). If the government assumes the debt of a private entity, the government can stake a claim to its assets; alternatively, an imputed capital transfer to a domestic entity or a capital grant to a foreign entity can be recorded in the operating statement.

C. Disclosure Requirements for Guarantees

27. **Transparency with respect to guarantees under any basis of accounting can be strengthened by disclosing supplementary information in budget documents, fiscal reports, and financial statements.** While international accounting standards require governments reporting on an accrual basis to disclose information on contingent liabilities, including guarantees, there has been a more general trend in the last decade or so in the direction of disclosing supplementary information on guarantees. This often takes the form of a schedule on the stock of outstanding guarantees that accompanies financial statements, and some countries (also or instead) provide information on guarantees and other contingent liabilities with their annual budgets.¹⁵ Fiscal transparency standards actually call for the provision of such information in budget documents. More specifically, the Fund's *Code of Good Practices on Fiscal Transparency* requires that budget documentation should provide details of the nature and fiscal significance of contingent liabilities. Finally, *GFSM 2001* follows the *System of National Accounts 1993 (SNA 93)* by requiring information on contingent liabilities to be recorded as memorandum items to the balance sheet.¹⁶ Appendix II contains details of selected international reporting standards for guarantees.

28. **While current international standards share common features, there is merit in combining their various elements into a set of comprehensive reporting requirements for guarantees.** Box 1 contains requirements that could apply irrespective of the basis of accounting, and these could be reflected in an accounting and reporting standard for guarantees and other contingent liabilities that specifies in detail the required format, content, timeliness, acceptable methods of valuation, periodicity of disclosure, and audit

¹⁵ A number of countries provide examples of good practice, although the detailed assessment of various guarantee programs in the United States is the most easily accessible—see U.S. Government (2004a). Other countries to look at include Brazil, Czech Republic, Pakistan, and South Africa.

¹⁶ However, inclusion of the net present value of the obligations of social security schemes as contingent liabilities (in addition to the stock of explicit government guarantees) is mistaken for the reasons given in the second bullet of paragraph 3.

Box 1. Comprehensive Disclosure Requirements for Guarantees

Irrespective of the basis of accounting, information on guarantees should be disclosed in budget documents, within-year fiscal reports, and end-year financial statements. Guarantees should ideally be reported in a fuller *Statement of Contingent Liabilities* which is part of the budget documentation and accompanies financial statements, with updates provided in fiscal reports.

A common core of information to be disclosed annually for each guarantee or guarantee program is as follows:

- A brief description of its nature, intended purpose, beneficiaries, and expected duration.
- The government's gross financial exposure.
- The possibility of any reimbursement, recovery, or financial claim by government on the guarantee-recipient should the contingency occur.
- Where feasible, an estimate of the most likely fiscal cost or impact, either as a point estimate or a range.
- Any change in each item or category since the previous reporting period, including any payments made, any financial claims established against defaulters as a result of those payments, and any waivers of such claims.
- Any guarantee fees or other revenue received.

In addition, budget documents should provide:

- Details of payments made under individual guarantees or guarantee programs for each of the previous two years.
- An indication of what allowance, if any, has been made in the budget (e.g., in a contingencies appropriation) for expected payments under guarantees.
- A forecast and explanation of the total of new guarantees to be issued in the budget year.

During the year, details of new guarantees issued should be published in the Government Gazette as they are issued. Within-year fiscal reports should indicate new guarantees issued during the period, payments made on called guarantees, and the status of claims on guarantee recipients, and provide an updated forecast of payments under guarantees and issues of new guarantees for the full year.

Finally, governments should provide a reconciliation of the change in the stock of public debt between the start and end of the year, separately showing that part of the change attributable to the assumption of debt under government guarantees.

arrangements.¹⁷ Quantification should be undertaken wherever feasible, at least of the gross exposure, and of the likely fiscal impact as capability is developed to value guarantees.¹⁸

¹⁷ Information on guarantees (and other contingent liabilities) is subject to audit by the Supreme Audit Institution in Canada, New Zealand, and the United States.

¹⁸ There may be some situations where disclosure of an estimate of the likely fiscal cost may prejudice the government's position in a dispute with third parties—for example, estimating the expected cost of legal action being brought against the government. In these situations, which will be infrequent, it may be sufficient to disclose just the gross exposure (accompanied, in the case of potential legal liabilities, by a disclaimer that this in no way reflects an admission of liability).

29. **Compiling even the basic information required for disclosure can represent a challenge.** In many countries, guarantees are poorly documented (and in some instances may not be documented at all). Information on guarantees will generally be held by individual government departments and agencies, and centralization of this information is required to compile a statement of guarantees across government. This might be best achieved through incorporating information on guarantees in the requirements for budget submissions and fiscal reports provided by individual departments and agencies to the ministry of finance. To this end, it needs to be made clear that department and agency managers are responsible for providing this information, and that records of guarantees will be subject to audit. Of course, a requirement to provide information about guarantees does not imply a *carte blanche* to offer guarantees.

VI. MANAGING THE FISCAL RISK POSED BY GUARANTEES

30. **The potential fiscal costs associated with guarantees argue in favor of carefully controlling them with a view to managing fiscal risk.** However, the effort devoted to this should reflect the significance of guarantees in each country. Guarantees are only one source of fiscal risk facing governments, and controlling them should ideally be seen as a component of the government's management of its overall liabilities and assets. The attention devoted to guarantees should therefore be proportional to the significance of guarantees in comparison to other sources of fiscal risk, including other explicit contingent liabilities, implicit contingent liabilities, and policy-based risk (e.g., from social security obligations). Measures to control guarantees should also be appropriate to the risk guarantees pose for a particular country, and the sophistication of its financial management system.

A. Direct Control of Guarantees

31. **Centralized control over the granting of guarantees will often be appropriate.** Depending on the situation in individual countries, this may mean requiring the prior approval of the minister of finance, the cabinet, or the legislature, under guidance provided by a well-articulated policy framework that covers the justification, design, analysis, and approval of guarantees. Box 2 summarizes the management framework for loan guarantees in Canada. Decisions over guarantees should be integrated with the annual budget cycle, and with analysis of sectoral policies and budgets, so that guarantee proposals are considered alongside alternative instruments and programs with similar objectives. There is an issue as to whether the central government should control the granting of guarantees by subnational government. In general, it should do so, since even in the absence of an explicit counterguarantee by the central government, it will usually be understood to stand behind subnational government. The only exception should be where there is a clear and credible no bailout provision.

Box 2. Management Framework for Loan Guarantees in Canada

To control the growth of loan guarantees (and loans), Canada requires that:

- The sponsoring public entity must demonstrate that the project could not be financed on reasonable terms and conditions without a government loan or guarantee.
- An economic analysis is made demonstrating that the project's cash flows are sufficient to cover repayment of the guaranteed debt and other costs, and yield a sufficient rate of return.
- Project sponsors must supply a substantial portion of equity funds from their own resources.
- Lenders must bear at least 15 percent of the net loss associated with any default.
- Where the government is requested to bear substantial downside risks, consideration must be given to allow parallel sharing of the upside potential.
- Fees are set which cover the estimated cost of future losses and administrative costs.
- All new loans and guarantees must be approved by the Ministry of Finance.

Parliament sets a maximum limit on new loans and guarantees.

32. **The government should have access to specialist advice in exercising control over guarantees, and should conduct its oversight in a transparent manner.** The issues involved in evaluating, designing and valuing guarantees are complex, requiring specialist financial, legal, and sector-specific technical expertise. Moreover, those pressing the government to provide guarantees are often better placed to value them, and have an incentive to assert that they are likely to be of little cost to government. This is certainly true of the private sector beneficiaries, and to some extent of the sector ministry sponsoring a project and an associated guarantee proposal. It is therefore important that the ministry of finance plays an active role in developing and reviewing guarantee proposals, as well as in monitoring and managing guarantees, and that these functions are subject to independent audit.

33. **A government wishing to assert firm control over guarantees should consider limiting them through a quantitative ceiling.** A ceiling on the stock of guarantees or the issuance of new guarantees can potentially create a quasi-budget constraint, generating increased scrutiny and prioritization of individual proposals. The ceiling should be approved by the legislature. It can be expressed in various ways—for example, on the face value of the stock of new guarantees or as a proportion of total government revenue or expenditure, or (in more advanced systems) on expected cost. The ceiling might apply across the entire government, or it could apply to specific individual entities.¹⁹ It could also be specified in terms of well-defined sources of contingent liabilities, such as government insurance programs (although this would probably work better if the ceiling was applied to an entity

¹⁹ Whether the central government specifies a ceiling that covers subnational government will depend primarily on whether the central government explicitly or implicitly stands behind subnational government.

responsible for administering these programs).²⁰ A ceiling has particular merit where the government's risk exposure from guarantees is difficult to quantify.

34. **It is especially important to control implicit contingent liabilities, although doing so is particularly challenging.** Such liabilities can have sizable financial implications, especially when the government backstops public enterprises, public financial institutions, subnational governments, and private firms. Moreover, PPPs are in many cases responsible for the monopoly supply of essential services, and this can expose the government to significant costs if a private operator fails to perform and an alternative source of supply has to be secured. One way to control implicit contingent liabilities is to make them explicit. For example, the government could announce a ceiling on costs that it is willing to cover. However, while this may work for bank deposits or disaster recovery, such a ceiling is unlikely to be credible in the case of entities owned or controlled by the government, or where a strategically important private firm is concerned. An alternative is for the government to monitor the financial position of these entities if they pose major implicit risks, and if necessary to place restrictions on their activities. In the case of PPPs, the government can set minimum performance standards for private operators, require performance bonds to be posted, or establish step-in rights.²¹

B. Budgeting for Guarantees

35. **Governments should at least appropriate in their annual budgets the expected cost of payments to meet called guarantees in the next year.** This ensures that the legislature is fully informed about such an expense at the time the budget is presented, that it does not crowd out other priority spending during budget implementation or add to the fiscal deficit, and that it is pre-authorized.²² It will also ensure that any debt incurred or assumed will be consistent with the government's overall debt management strategy. The budget documents should contain an explanation of the basis for the amount of the appropriation, and identify the main guarantees or guarantee programs that are expected to result in calls. The guarantee appropriation should be increased if necessary in a supplementary budget during the year. If the full amount of the appropriation is not required, the unused portion can

²⁰ In addition to Canada, other countries that have quantitative ceilings on guarantees include Hungary, Israel, Japan Kazakhstan, Latvia, the Netherlands, Portugal, and Tunisia.

²¹ For example, in South Africa the *Municipal Finance Act 2003* stipulates that municipal debt guarantees can only be issued with national government approval, and only if the municipality creates a cash-backed reserve or purchases insurance to cover the debt. This limits the national government's implicit counter-guarantee.

²² This appropriation might be a general contingency appropriation, to cover a variety of contingent and unexpected events. But in countries where payments on called guarantees are significant, a separate guarantee appropriation is likely to improve transparency and accountability. This is the practice, for instance, in Hungary, Japan, Kazakhstan, Malaysia, Mexico and Slovak Republic.

be reallocated if it is clear that it will not be needed; otherwise, it should lapse at the end of the year.²³

36. Budgeting only for the expected cash cost each year still leaves a bias in favor of the use of guarantees. In the absence of any immediate impact on the budget of the sponsoring government entity, guarantees remain something of a free good for such an entity, which will have an incentive to propose a guarantee when a direct expense or loan may be more efficient and effective. Moreover, the budgetary costs to the government in the initial years of a PPP project can be reduced by packaging some elements into government guarantees that will increase costs in later years. Presenting ex ante estimates of expected cost at the time decisions are made to grant guarantees, and disclosing comprehensive information on them ex post, helps to reduce the incentive to resort to guarantees.

37. Where reasonably reliable estimates of the expected cost of a guarantee can be made, governments should reflect the full expected cost in the budget when the guarantee is granted.²⁴ The amount of the appropriation should reflect the stream of expected guarantee payments, an allowance for administration costs, and a margin to reflect the government's degree of risk aversion given the variance in the expected cost.²⁵ In principle, budgeting for the expected cost of a guarantee over its lifetime at the time it is granted would bring guarantees fully into the discipline of the budget process, and leave departments neutral as between guarantees and other forms of fiscal assistance. It would also ameliorate incentives on departments responsible for the design and negotiation of PPPs to use guarantees as a way of shifting costs to the future. The appropriation should be recorded under the expenditure category relating to the activity concerned, and the amount reviewed periodically and adjusted if necessary to reflect developments. Colombia budgets for contingent liabilities resulting from guarantees provided for infrastructure projects, while the United States budgets for the expected cost of loan guarantees. Details are provided in Boxes 3 and 4.²⁶

²³ Policies will be required to establish the point at which payments under called guarantees are treated as public debt service, and cease to be a charge against the guarantee appropriation.

²⁴ For the very small number of countries that both report and budget on an accrual basis, and where the calling of a guarantee is not expected to result in a liability that is matched by an asset, a decision to recognize a guarantee as a liability will mean that an expense equivalent to the full expected cost is automatically recorded in the budget.

²⁵ Where uncertainty over expected costs is high, the level of existing exposures is high, and/or guarantees have proliferated out of control, a government may wish to adopt a cautious approach to deciding the margin. At the limit, it would be possible to budget for the full gross exposure under new guarantees, as the Netherlands did at one stage before moving to budgeting for a measure based on expected cost.

²⁶ For a description of how the federal credit guarantee operates, see U.S. Government (2004b). Similar issues arise with respect to government-provided insurance, and it has been proposed in the United States to introduce for insurance programs the same sort of expected cost budgeting as operates for the credit guarantee, although this has not been adopted to date.

Box 3. Budgeting for Contingent Liabilities in Colombia

The legal framework in Colombia has since 1998 required budgeting for explicitly contracted contingent liabilities, and also provides policy guidelines on risk allocation to ensure that the use of guarantees reflects efficient risk transfer principles. Each government entity providing a guarantee must include the estimated cost in its budget at the time a guarantee is granted, using valuation methodologies established by the Contingent Liabilities Division in the Ministry of Finance. Appropriations are based on a coverage of costs under 95 percent of possible outcomes for each guarantee. The entity pays the appropriated amount into a centralized *Contingent Liabilities Fund* (FCCEE) according to an agreed deposit plan. The deposit plan takes into account the cash flow of the entity and the risk profile of the guarantee, and attempts to smooth out deposits over time. The law allows the use of temporary liquidity mechanisms to cover the appropriations to the FCCEE. FCCEE assets (which can only be invested in government securities and AAA-rated instruments) are managed by a fiduciary. An estimate of contingent liabilities has begun to be reported annually to congress as part of the medium-term fiscal framework.

Entities maintain a separate account with the FCCEE for each project, and for each type of risk within a project. The estimates of the expected value of each risk are reviewed annually by the ministry of finance to take into account new information, and the corresponding deposit plans are revised if necessary. If the guarantee is called, the FCCEE will cover only up to the amount in the respective account, the difference being met by the responsible entity. Money in an account cannot be transferred to cover the costs of calls arising from guarantees issued by other entities. Once a specific risk has lapsed, the funds associated with that risk are transferred to other risk accounts within the same project; once the project is completed, funds are transferred to other projects undertaken by the same entity; and finally, if the entity has no other projects, funds are reimbursed to the entity.

Box 4. Budgeting for Loan Guarantees in the United States

With the Federal Credit Reform Act (FCRA) of 1990, the United States introduced present value cost budgeting for federal government loans and loan guarantees within an otherwise essentially cash-based budget. The budget records the expected net cost to the government when the loans are disbursed or guarantees granted. This enables the fiscal effects of loans, guarantees and grants to be compared directly with each other, and removes the bias in favor of guarantees under cash budgeting.

The cost is estimated as the present value of disbursements over the term of the loan less the present value of expected collections (administration costs are omitted). The budget records these costs in *credit program accounts*. No payments actually leave the Treasury, and no cash reserve is created. When a loan is disbursed or a loan guarantee issued, the program account outlays the expected cost to a non-budgetary *credit financing account*. The financing accounts record the actual transactions with the public (e.g., loan disbursements and repayments, interest, guarantee fees). Each agency responsible for a credit program must re-estimate the cost of outstanding loans and guarantees each year, although the Office of Management and Budget has overall responsibility for the estimates. If the estimated amount increases or decreases a transaction takes place between the program account and the financing account. The FCRA provides for permanent indefinite appropriations to pay for upward re-estimates (provided the terms of the original loan or guarantee remain unchanged).

The transactions of the financing accounts do not appear in the government budget (although the transactions of the financing and program accounts are presented in budget documents for information and analytical purposes).

38. **Budgeting for guarantees does not mean that the government has to set aside funds to meet the cost of called guarantees.** Whether to set aside cash for this purpose is a financial management issue, analogous to the decision whether to set up a sinking fund to finance future debt repayments. Thus a full appropriation for the expected cost of a guarantee could be used to set up a reserve fund out of which future payments on called guarantees would be made, as in Colombia.²⁷ Alternatively, expected guarantee payments can be recorded as memorandum items, as in the United States. The key objective of budgeting for the expected cost is to engender discipline at the time the decision is taken to grant a guarantee.

39. **Nor does the government have to earmark funds (e.g., from guarantee fees or revenue sharing proceeds) to meet the cost of future calls on guarantees.** Those in favor of earmarking argue that: it can assist with the management of the uncertain future cash impact of calls on guarantees;²⁸ it may provide a useful means to keep track of and to control the disposition of any revenue generated by guarantees; and, in some countries, it may also provide added assurance to guarantee holders that funds will be there if and when required (increasing the government's credibility as a contracting partner, for example in the early stages of a PPP program). However, earmarking reduces flexibility in cash management, and may increase costs.²⁹ In practice, the funds may be held in government securities, effectively unwinding the transaction. There are also other means available to countries to assist with managing the uncertain cash-flow impact of guarantees. For instance, concession contracts in Chile provide for a lag between calls on guarantees and government payments.³⁰

C. Guarantee Fees

40. **Charging guarantee fees improves incentives.** Charging an origination fee against the budget of the sponsoring government department at the time a guarantee is issued may help to internalize the cost of the guarantee, although only if it means the department has to forgo some other expenditure at the margin. In addition, the sponsoring department might be

²⁷ Future payments from such a fund would not impact the budget measured on an accrual basis at the time they are made, as the money in the fund would already have been appropriated and incorporated in the budget at the time the guarantees were initially granted.

²⁸ The amount to be set aside in such a fund will not necessarily be the same as the amount budgeted. The size of the set-aside should depend on the probability distribution of costs, and the extent to which the government wishes to ensure there will be sufficient funds to meet the costs of possible calls under various eventualities. The size of the fund should be subject to regular actuarial review to ensure that it is sufficient to meet its intended objectives.

²⁹ For instance, overall risk may be reduced by pooling unrelated risk exposures, so that earmarking funds for the expected cost of each individual guarantee and guarantee program may result in over-reserving of funds.

³⁰ However, this provision will be priced into contracts.

required to meet a (small) portion of the cost of any subsequent call on a guarantee.³¹ This might reduce somewhat the scope for imprudent use and poor monitoring of guarantees. However, the major gains come from charging the guarantee recipient a fee that bears some relationship to the expected cost of the guarantee. Through such “pricing” mechanisms, the recipient is made to bear the cost of the guarantee to a significant extent, and does not face the same incentive to include guarantees in contracts as a means to disguise the true cost or gain at the government’s expense.³² Guarantee fees also reduce the likelihood of governance problems. When governments seek to share in the upside risk, as in Chile where minimum revenue guarantees are combined with revenue sharing, best practice is to separately value upside and downside risks, since even a net expected cost of zero may mask significant risk being taken on by government.

D. Institutional Development

41. Well-functioning institutions are key to the effective management of guarantees.

In countries with weak institutions, the priority should be to set up a public debt management unit in the ministry of finance that maintains a central register of debt and guarantees (and not only guaranteed debt), and assesses requests for new guarantees against appropriate debt and liability management guidelines. This will in effect provide a basis for centralized control over guarantees, and the integration of guarantee exposure into debt and cash management. Denmark and Sweden are examples of countries that do the latter well, while Ireland does it for PPP financing more generally. Where institutions are stronger, the emphasis should be on developing the capacity to measure guarantee exposure more precisely, and to adopting approaches to accounting, reporting, and budgeting that properly reflect this exposure.

VII. THE CONSEQUENCES OF GUARANTEES FOR DEBT SUSTAINABILITY

42. Debt sustainability analysis is usually based on a fairly narrow concept of public debt.

Often this is restricted to gross debt in the form of government securities and loans to government, and possibly liabilities created under financial leases, although sometimes the focus is on net debt, excluding government deposits, government securities held by social security funds and other government entities, and loan made by government. However, even under *GFSM 2001*, while the concept of debt (and assets) is extended significantly, it does not cover the wide range of obligations referred to in Table 1. Yet judgments about debt sustainability are not independent of the government’s nondebt obligations, since these give

³¹ Origination fees may at least help to establish a link to the annual budget process; also, the sponsoring department could be required to report a contingent liability on its books with respect to the co-payment (it would be required to do so under accrual accounting).

³² This also improves allocative efficiency, by fully costing all inputs to infrastructure projects, and removing implicit untargeted subsidies to consumers.

rise to nondiscretionary spending that constrains fiscal policy options in exactly the same way as debt service.

43. **The case for looking at a wider range of government obligations in assessing debt sustainability has been made forcefully by the staff in connection with PPPs.** In SM/04/93, it has argued that PPPs impose known and potential future costs on the government that can influence debt sustainability in much the same way as if the government had borrowed to finance public investment and committed to future provision of services. Consequently, in connection with debt sustainability analysis, it is recommended that:

- The net present value of future payments by the government under PPP contracts, less income received by the government from private operators, should be treated as a liability which is added to public debt; and
- A particular debt path should be viewed less favorably if guarantees are judged to be a significant source of fiscal risk. While the contingent liability deriving from guarantees could in principle also be added to public debt, it was recognized that valuation problems would often preclude this.

44. **Should PPP and other government obligations be added to public debt when assessing debt sustainability?** A case can be made for doing so with legal obligations that limit the government's room for maneuver when it comes to fiscal adjustment. When this is done, actual and potential spending in connection with these legal obligations would be deducted from primary spending (to bring it into line with discretionary spending), and additional primary adjustment will be needed if debt plus actual and potential liabilities arising from legal obligations are together unsustainable. An analytically equivalent approach is to count actual and potential spending in connection with these legal obligations as primary spending, in which case additional primary adjustment will be needed to meet the original debt target. On balance, the latter is probably a better approach, in that it avoids the need to treat the net present value of future payments by the government under PPP contracts as a liability, which has little prospect of being accepted by accountants or statisticians.³³ The case for extending the same approach to constructive obligations and implicit contingent liabilities is weaker, since there may always be scope to cut spending that the government is not legally bound to make. Moreover, while the government may in effect be committed to providing a certain minimum level of many services and to stepping in when disasters hit, spending incurred in doing so should not be protected from scrutiny that could reveal scope for cost savings.

³³ Implementing this approach will require the disclosure of additional information about guarantees to that recommended in Box 1. To ensure consistency with the debt sustainability analysis, economic and financial assumptions used for valuation, together with the currency composition of guarantees, have to be disclosed, while the disclosure of the riskiness of expected guarantee payments would facilitate sensitivity analysis.

45. **The uncertainty created by guarantees nonetheless remains a significant source of complication for debt sustainability analysis.** If more guarantees are called than expected, this can undermine debt sustainability and increase the likelihood of fiscal problems and ultimately fiscal crises. A cautious approach would be to take the government's maximum risk exposure under guarantees into account in assessing debt sustainability, although this could unnecessarily limit fiscal policy flexibility.³⁴ A more reasonable approach is to construct scenarios corresponding to alternative degrees of risk exposure arising from guarantees, with a view to determining the additional fiscal adjustment that would be required under each scenario, and ideally to pre-identifying measures that could be put in place should a worse than expected outcome materialize. This is more sophisticated than the approach to debt sustainability analysis currently used in the Fund, which stress tests baseline debt projections for a step increase in liabilities deriving from called guarantees and other contingent liabilities, in that it requires consideration of the events that might trigger guarantees, and their impact. That said, the Fund is considering a stochastic simulation approach to computing a probability distribution of possible debt outcomes around baseline estimates.

46. **An even more sophisticated approach to assessing debt sustainability under uncertainty would apply Value-at-Risk (VaR) methodology.** If a probability distribution of calls on guarantees can be derived using the techniques discussed in Section V and Appendix I, this can provide the basis for deriving a probability distribution for net worth (excluding the liability deriving from called guarantees). This probability distribution can then be used to measure value-at-risk. For example, if there is a 5 percent probability that net worth will fall by 10 percent of GDP because of called guarantees, all other things being equal VaR from guarantees at the 95 percent level is 10 percent of GDP. The larger the VaR, the more cautious a government needs to be in terms of planning for fiscal adjustment should guarantees be called, and better still in terms of strengthening the fiscal position in advance so that this and similar shocks can be accommodated without the need for fiscal adjustment. The VaR approach underlies the decision in Colombia to budget for 95 percent of the expected cost of guarantees. Barnhill and Kopits (2004) also apply the VaR approach to assess government balance sheet risks and fiscal sustainability in Ecuador, and conclude that traditional debt sustainability significantly understates fiscal vulnerability in the face of volatile sovereign yield spreads, exchange rates, and oil prices, combined with fiscal rigidities.

47. **The information requirements for full-fledged VaR analysis are, however, demanding.** In particular, few countries have comprehensive public sector balance sheets, which are a minimum requirement for estimating net worth at risk. However, VaR can be applied to the liability side of the balance sheet alone. This is done by Garcia and Rigobon (2004) in assessing debt sustainability in Brazil. It is shown that while debt is sustainable

³⁴ Moreover, such an approach could end up being tantamount to a blanket prohibition of new guarantees when the aim of being alert to fiscal risks is to filter out unjustifiable guarantees.

according to traditional measures in the absence of risks, there is a nontrivial probability that underlying macroeconomic variables will evolve in a manner that produces unsustainable debt paths. As an alternative to the VaR approach, Alvarado, Izquierdo, and Panizza (2004) examine debt sustainability in Ecuador applying the Mendoza-Oviedo probabilistic model, which says that the government can only make a credible commitment to service its debt if it would not default under any feasible revenue path. It is shown that revenue volatility could be source of a fiscal crisis given expenditure rigidity, and that oil shocks and sudden stops in capital flows could have substantial fiscal costs.

VIII. CONCLUDING COMMENTS

48. This paper has addressed a number of issues raised by guarantees, and the discussion points to some clear conclusions.

- While guarantees are a legitimate public policy response in the face of risks that the government bears or at least shares with the private sector, guarantees need to be compared with alternative forms of government intervention and they need to be tailored to meeting their specific objectives. The private sector should in general be left bearing some risk.
- Government accounting and budgeting systems typically create a bias in favor of guarantees over other forms of spending which is subject to budget scrutiny. It is therefore important to be transparent about the fiscal risks created by guarantees. Decisions concerning guarantees should also be taken in the context of the annual budget, based on reviews of guarantee proposals by ministries of finance that are subject to independent audit.
- Valuation of the contingent liabilities resulting from guarantees is the key to full transparency, but this is a technical and informational challenge. That said, Chile has achieved a high standard in estimating and reporting on guarantees, and all countries that provide extensive guarantees should aim for a similar standard. Where valuation is difficult, the other disclosure practices recommended in this paper for guarantees and PPP programs should still be adopted.
- Guarantees need to be controlled to manage fiscal risk, and quantitative ceilings should be placed on guarantees and other explicit contingent liabilities where risk exposure is high. One way to control implicit contingent liabilities is to make them explicit, although this is difficult in the case of the government's implicit obligation to stand behind entities it owns or controls, or strategically important private firms.
- Governments should always appropriate in the annual budget the expected cost of guarantees in that year. Where valuation is possible, governments should also budget for the full cost of guarantees. This does not mean that funds should be earmarked for this purpose; while this may impose discipline on the budget process, it does so at the

cost of flexibility. Charging guarantee fees may contribute to the control of guarantees.

- Guarantees should be taken into account in assessing debt sustainability. If valuation is possible, the expected future costs should be factored into primary spending and the adjustment required to meet a particular debt target; otherwise, debt sustainability assessments should be more cautious in countries with large guarantee programs. It is also desirable to reflect the uncertainty created by guarantees in debt sustainability analysis, but techniques for doing this are still at an early stage of development. In the meantime, greater use should be made of scenario analysis to stress test debt projections under alternative assumptions about calls on guarantees.

MODELING AND ESTIMATING THE VALUE OF GOVERNMENT GUARANTEES IN CHILE

49. The purpose of this appendix is to outline the analytical approaches to modeling and estimating guarantees used in Chile, and to report the results obtained. The World Bank has provided technical assistance to the Chilean authorities in this area.

50. The concessions program in Chile covers 44 contracted projects with a total value of US\$5.7 billion (about 6¼ percent of 2004 GDP). These include: 8 projects to upgrade the Route 5 highway which runs the length of Chile, with financing from tolls (US\$2 billion); 11 other highway projects for connecting roads to Route 5 (US\$1.3 billion); 10 airport projects (US\$240 million); 6 urban road projects (US\$1.8 billion); and 9 other projects (including prisons, public buildings, a reservoir, for US\$365 million).

51. A minimum revenue guarantee (MRG) is provided for nearly all highway and airport concessions. Under the terms of the guarantee, the government will compensate concession firms when traffic or traffic revenue falls below an annual threshold which is generally set to provide around 70 percent of projected revenue over time. In return for the MRG, the concession firm enters into a revenue sharing agreement (RSA) in which it shares a percentage of revenue (or in some cases profits) with the government once a certain threshold is exceeded. Triggers for the RSA are calibrated at a level that is consistent with profitability of 15 percent in real terms.

52. Under the terms of the exchange rate guarantee, which applies to debt service payments, the government compensates the concession firm if the *Unidad de Fomento* (UF)—a unit of account that is adjusted daily for past inflation—depreciates against the US dollar by more than 10 percent relative to a rate locked-in at the time of debt placement, and the concession firm pays the government if the UF appreciates by more than 10 percent. Concession firms have 1-2 years from the date of a contract to opt for coverage under the exchange rate guarantee, and can opt out at any time. Firms opting for the foreign exchange guarantee have been required to carry out additional work equivalent to 0.1 percent of the project cost, and are charged a 2 percent premium if the guarantee is called.

53. For the **minimum revenue guarantee (and revenue sharing)**, the underlying risky variable—revenue in any period (R_t)—is assumed to follow geometric Brownian motion with drift, in which case:

$$dR_t = R_t (\hat{\imath} dt + \hat{\imath}\hat{\imath} dt Z)$$

where $\hat{\imath}$ = the growth rate of R , $\hat{\imath}\hat{\imath}$ = the variance of R , dt = an increment of time, and Z = a normally distributed random variable with a mean of 0 and variance of 1. It therefore follows that:

$$R_t = R_0 \exp [(\hat{\imath} - \hat{\imath}\hat{\imath}/2) dt + \hat{\imath}\hat{\imath} dt Z]$$

where R_0 = the starting level of R .

54. Monte Carlo simulation analysis involves taking a large sample of drawings from Z to produce a probability distribution for R_t based on estimates of $\hat{\imath}$ and \hat{u} which can be derived from past or comparable experience, but if necessary set by assumption. The expected guarantee payment for period t then follows directly. This is repeated for each period that the guarantee is in force.³⁵

55. The value of the guarantee is the present value of expected guarantee payments over the life of the guarantee. The value of the guarantee can be computed using a risk-free interest rate, but this ignores the risk characteristics of expected guarantee payments. An alternative approach is to convert the risky revenue variable to a certainty equivalent, as follows:

$$R_t = R_0 \exp [(\hat{\imath} - \hat{u}^2/2 - \hat{\epsilon}\hat{u}) dt + \hat{u} dt Z]$$

where $\hat{\epsilon}$ = the market price of revenue risk. The market price of revenue risk can be estimated using the capital asset pricing model (CAPM), in which case:

$$\hat{\epsilon} = \hat{\imath}[(m - r)/\hat{u}_m]$$

where m = the expected return on the market portfolio, r = the risk-free interest rate, \hat{u}_m = the standard deviation of the return on the market portfolio, and $\hat{\imath}$ = the correlation coefficient between the market return and revenue. The value of the guarantee can then be calculated using a risk-free interest rate to discount expected guarantee payments.

While the majority of beneficiaries of the minimum revenue guarantee receive a cash payment when they call the guarantee, some highway concession firms have been allowed to opt for a revenue distribution mechanism whereby the concession contract is changed from fixed to variable term, with the duration of the contract depending on revenue collected. A least-present-value-of-revenue franchising mechanism has also been used, where the concession ends when the contracted present value of revenue is reached. While this clearly imposes a financial cost on the government, in that there is an opportunity cost in not being able to either tender a new franchise or to take control of the asset and the revenue it generates, this complication is not taken into account in valuing guarantees.

56. For the **exchange rate guarantee**, it is assumed that the underlying risky variable—the US\$/UF exchange rate in period t (E_t)—follows geometric Brownian motion with drift, and that drift (i.e., the expected rate of appreciation or depreciation) is equal to the interest rate differential. This implies that:

$$dE_t = E_t [(r_{UF} - r_{US\$}) dt - \hat{u}_E dt Z]$$

³⁵ The model used in Chile is more sophisticated than this, and allows for correlations between the revenue generated by different projects, and between revenues and macroeconomic variables such as GDP and the exchange rate.

where r_{UF} = the UF risk-free interest rate, $r_{US\$}$ = the US\$ risk-free interest rate, and \ddot{u}_E = the volatility of the US\$/UF exchange rate. If this is the case, the exchange rate guarantee can be valued as an option using the Black-Scholes (B-S) options pricing formula.

57. The exchange rate guarantee in effect gives the concession firm a call option on U.S. dollars when the UF depreciates by more than 10 percent, and the government a put option on U.S. dollars when the UF appreciates by more than 10 percent. Since the B-S formula applies to options that can be exercised only once at a specific maturity date (i.e., European options), and the exchange rate guarantee can be exercised at any time a debt service payment falls due, it is necessary to view the guarantee as a sequence of options to apply the model.

58. The value of the exchange rate guarantee in period t (G_t) is:

$$G_t = \sum_i (P_{it} - C_{it})$$

where S_i = US\$ debt service payment in period t+i, P_{it} = value of a put option of maturity i in period t, and C_{it} = value of a call option of maturity i in period t. Summation is over the life of the guarantee. P_{it} and C_{it} are estimated using from the B-S formula as follows:

$$P_{it} = E^* \exp(-r_{UF}i) N(y_2) - E_i N(y_1)$$

$$C_{it} = E_i N(y_1) - E^* \exp(-r_{UF}i) N(y_2)$$

where E^* = the guaranteed US\$/UF exchange rate (i.e. the exercise price of the option), $N(y)$ = the probability that a normally distributed variable will be less than or equal to y, and

$$y_1 = [\ln(E^*/E_i) - (r_{UF} + \ddot{u}_E^2/2) i] / \ddot{u}_E i$$

$$y_2 = y_1 + \ddot{u}_E i.$$

59. A complication is created in valuing the exchange rate guarantee by the fact that the concession holder has the option to cancel the guarantee at any time. This provision undermines the application of B-S formula, which cannot be used to value options that can be exercised continuously (i.e., American options). Moreover, exercising such an option requires the concession holder to anticipate the likely evolution of the exchange rate. Binomial trees are better suited to modeling the more complex decision-making process that characterizes this case.³⁶

³⁶ Starting with the initial value of the risky variable, binomial trees depict upward or downward movements in this variable and associated guarantee payments depending on two possible states of the world that occur with known probabilities. This process is repeated over successive periods, with the number of branches doubling each period, until the guarantee expires. The full range of outcomes provides the probability distribution of guarantee payments over the life of the guarantee, and the value of the guarantee is computed by taking the present value of all the values for guarantee payments in this distribution, weighted by their respective

(continued)

60. Using the Monte Carlo simulation analysis to value the minimum revenue guarantee and revenue sharing, and the Black-Scholes options pricing formula to value the exchange rate guarantee, the *Report on Public Finances* for 2005 contains a table reporting the contingent assets and liabilities created by the net minimum revenue guarantee (i.e., the minimum revenue guarantee less revenue sharing) and the exchange rate guarantee for every concession.³⁷

61. This is supported by four additional tables providing: details of each concession (the project, its nature, physical size, value, and duration, the private partner(s), date of award, and status); concession commitments (investment, subsidies, additional work, and minimum revenue guarantees) in present value terms; and expected annual cash flows arising from guarantees for 2004-24.

probabilities. While binomial trees allow considerable flexibility in modeling the behavior of the risky variable from period to period, they are computationally cumbersome.

³⁷ The models used in Chile generate information on the entire distribution of expected guarantees costs, which allows a probability to be assigned to all possible outcomes (including worst cases). This would be particularly useful information from risk management perspective, although only in the context of assessing the risk characteristics of the government's overall liabilities.

INTERNATIONAL ACCOUNTING AND REPORTING STANDARDS FOR CONTINGENT LIABILITIES

International accounting standards

62. International accounting standards specify the treatment of guarantees and other contingent liabilities for government entities using the accrual basis of accounting. There is a hierarchy of international standards: if there is no International Public Sector Accounting Standard (IPSAS), entities should comply with International Financial Reporting Standards (IFRS) (incorporating International Accounting Standards (IAS) and Interpretations).³⁸

63. Under accrual accounting, the key judgment is whether a guarantee or program of similar guarantees should be classified as a liability, or as a contingent liability. International accounting standards require that a contingency should be recognized as a liability only where it is judged probable (i.e. more likely than not) that an expense will occur, and a reasonably reliable estimate can be made of the amount of the expense. Accounting standards have in recent years, however, been moving towards increased recognition of liabilities valued at fair value.

64. At present, different accounting standards apply to guarantees, depending on the type of guarantee or contingency concerned. IPSAS 19 (Provisions, Contingent Liabilities and Contingent Assets) should be applied to accounting for guarantees, except for financial instruments carried at fair value, and to guarantees arising in insurance contracts with policyholders.³⁹

65. Financial instruments carried at fair value are covered by IAS 39 (Financial Instruments: Recognition and Disclosure). The definition of a financial instrument is any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. It includes financial guarantee contracts, which are sometimes referred to as credit insurance, and cover financial guarantees, letters of credit, and credit default contracts.⁴⁰ IAS 39 provides for the recognition of financial guarantees as liabilities, valued at fair value, which is defined as the amount for which a liability could be settled

³⁸ IPSAS are issued by the International Federation of Accountants (IFAC). IAS are issued by the International Accounting Standards Board (IASB); Interpretations are issued by the International Financial Reporting Interpretations Committee (IFRIC), an IASB committee. IFRIC interpretations provide guidance on newly identified financial reporting issues not specifically addressed in International Reporting Standards. Entities must comply with these interpretations if their statements are described as complying with International Accounting Standards. The standards are contained in International Federation of Accountants (2004) and International Accounting Standards Board (2003).

³⁹ Insurance contracts are covered by IFRS 4 (Insurance Contracts).

⁴⁰ However, IAS 39 does not cover financial guarantees that transfer significant risk to the issuer, which are covered by IFRS 4. An amendment currently being proposed by IASB would see all financial guarantee contracts, including those that transfer significant risk, being covered by IAS 39.

between knowledgeable and willing parties in an arms length transaction. Fair value may be estimated by use of published prices, use of a rating issued by a rating agency, or use of appropriate estimation techniques such as discounted cash flow analysis and option pricing models.

66. Guarantees that are not covered by IAS 39, and are not insurance contracts, should be accounted for under IPSAS 19. A contingent liability is defined as:

- A possible obligation that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity.
- A present obligation that arises from past events but is not recognized because:
 - It is not probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation.
 - The amount of the obligation cannot be measured with sufficient reliability.⁴¹

67. A provision, on the other hand, is a liability of uncertain timing or amount. A provision should be recognized when:

- An entity has a present obligation (legal or constructive) as a result of a past event.
- It is probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation.
- A reliable estimate can be made of the amount of the obligation.

68. The commentary indicates that, where there are a number of similar obligations and the likelihood of an outflow for any one of them is small, the treatment is determined by considering the class of obligations as a whole. In other words, where the expected cost of a category of contingent liabilities can be estimated with sufficient reliability, a provision might be recognized (i.e., the contingency would be classed as a liability in the form of a provision rather than as a contingent liability). The amount recognized should be the amount an entity would rationally be expected to pay to settle the obligation or to transfer it to a third party.

⁴¹ The commentary in the standard indicates it will only be in extremely rare cases that no reliable estimate can be made of an existing liability; in such case the liability should be disclosed as a contingent liability.

69. Provisions should be reviewed at each reporting date, and adjusted to reflect the current best estimate. Where discounting is used, the carrying amount of a provision increases in each period to reflect the passage of time. This increase is recognized as an interest expense. A provision should be used only for expenses for which a provision was originally recognized.

70. IPSAS 19 requires certain disclosures in relation to contingent liabilities. Unless the possibility of any outflow in settlement is remote, an entity should disclose for each class of contingent liability at the reporting date a brief description of the nature of the contingent liability and, where practicable:

- An estimate of its financial effect;
- An indication of the uncertainties relating to the amount or timing of any outflow; and
- The possibility of any reimbursement.

Notes to the financial statements may include additional information useful as an input to assessments about financial position and performance, such as identifying the future events that would need to occur for a contingent liability to qualify for recognition as a liability.

71. IPSAS 19 also contains disclosure requirements for provision. For each class of provision, an entity should disclose:

- The carrying amount at the beginning and end of the period;
- Additional provisions made in the period, including increases to existing provisions;
- Amounts used (that is, incurred and charged against the provision) during the period;
- Unused amounts reversed during the period; and
- The increase during the period in the discounted amount arising from the passage of time and the effect of any change in the discount rate.

72. An entity should disclose the following for each class of provision:

- A brief description of the nature of the obligation and the expected timing of any resulting outflows of economic benefits or service potential.
- An indication of the uncertainties about the amount or timing of those outflows. Where necessary to provide adequate information, an entity should disclose the major assumptions made concerning future events.
- The amount of any expected reimbursement, stating the amount of any asset that has been recognized for that expected reimbursement.

73. A contingent asset is a possible asset that arises from past events and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not wholly within the control of the entity. Contingent assets should be disclosed where an inflow of economic benefits or service potential is probable. Where such an inflow

is virtually certain, such items should be recognized as assets, rather than be disclosed as contingent assets.

74. IPSAS 15 (Financial Instruments: Disclosure and Presentation) contains additional disclosure requirements to enhance the understanding of on-balance sheet and off-balance sheet financial instruments, including contingent instruments such as financial guarantees. IPSAS 15 requires disclosure of risk management policies; of the terms, conditions, and accounting policies for each class of financial liability, including unrecognized liabilities; of information about exposure to interest rate risk and credit risk (including any significant concentrations of credit risk); and of information about how fair value is determined.

Fiscal reporting standards

75. The *Government Finance Statistics Manual 2001 (GFSM 2001)* follows the *1993 System of National Accounts (1993 SNA)* by not treating any contingencies as financial assets or liabilities because they are not unconditional claims or obligations. Only where a contingent contract relates to a financial arrangement (e.g., a financial derivative) where the arrangement has value because it is tradable does *GFSM 2001* call for recognition of the contingency as a liability. *GFSM 2001* also calls for aggregate data on all important contingencies to be recorded as a memorandum item. In addition to the gross amount of possible revenue or expense, estimates of expected revenue or expense should be included.

76. The *1995 European System of Accounts (ESA 95)* and the *ESA95 Manual on Government Deficit and Debt* specifies that, with one exception, government-guaranteed debt is a contingent liability, and should not be taken into account in the calculation of government debt. The exception is where the government guarantees the borrowing of a public enterprise, and where it is certain that the government, and not the enterprise, will service and repay the debt.

77. The Fund's *Code of Good Practices on Fiscal Transparency* (item 2.1.3) requires a statement describing the nature and fiscal significance of central government contingent liabilities to be part of the budget documentation. The *Manual on Fiscal Transparency* states that budget documentation should include a statement indicating the public policy purpose of each contingent liability, its duration, and the intended beneficiaries. Where possible, major contingencies should be quantified.

78. The OECD *Best Practices for Budget Transparency* require disclosure of contingent liabilities in the annual budget, the mid-year report to the legislature, and the final accounts, classified by category, and information on past calls on government to meet contingent liabilities should be disclosed.⁴²

⁴² These requirements are also part of a set of best practices included in the *Manual on Fiscal Transparency*.

REFERENCES

- Alvarado, Carlos Diaz, Alejandro Izquierdo, and Ugo Panizza, 2004, "Fiscal Sustainability in Emerging Market Countries with an Application to Ecuador," Inter-American Development Bank, unpublished.
- Arthur Anderson, 2000, "General and Specific Methodologies for Valuing Contingent Liabilities," Contingency Fund Project Report, Arthur Anderson, unpublished.
- Barnhill, Theodore, and George Kopits, 2004, "Assessing Fiscal Sustainability Under Uncertainty," *International Journal of Public Budget*, Vol. 55, pp. 85–124.
- Brix, Hana Polackova, and Allen Schick, eds., 2002, *Government at Risk: Contingent Liabilities and Fiscal Risk*, The World Bank and Oxford University Press.
- European Commission, 2004, *Public Finances in EMU, 2004*, European Economy, Reports and Studies (Brussels).
- Gapen, Michael, Dale Gray, Cheng Hoon Lim, and Yingbin Xiao, 2004, "The Contingent Claims Approach to Corporate Vulnerability Analysis: Estimating Default Risk and Economy-Wide Risk Transfer," IMF Working Paper No. 04/12 (Washington: International Monetary Fund).
- Gray, Dale, Robert Merton, and Zvi Bodie, 2003, "A New Framework for Analyzing and Managing Macrofinancial Risks of an Economy," MfRisk Working Paper No. 1-03.
- Garcia, Marcio and Roberto Rigobon, 2004, "A Risk Management Approach to Emerging Market's Sovereign Debt Sustainability with an Application to Brazilian Data," Working Paper No. 10336, National Bureau of Economic Research (Cambridge, MA).
- Heald, David, 2003, "Value for Money Tests and Accounting Treatment in PFI Schemes," *Accounting, Auditing and Accountability Journal*, Vol. 16, No. 3, pp. 42–371.
- Heller, Peter, 2004, "Are Governments Overextended? Assessing the Spectrum of a Government's Debts and Its Exposure to Risk," *World Economics*, Vol. 5. No. 4, pp. 1-31.
- Hemming, Richard and Teresa Ter-Minassian, 2003, "Public Debt Dynamics and Fiscal Adjustment", in *Managing Financial Crises*, Charles Collyns and Russell Kincaid (eds.), International Monetary Fund Occasional Paper No. 217.
- International Accounting Standards Board, 2003, *International Financial Reporting Standards*, International Accounting Standards Board (London).

- International Federation of Accountants, 2004, *Handbook of International Public Sector Accounting Pronouncements*, International Federation of Accountants (New York).
- Irwin, Timothy, 2003, “Public Money for Private Infrastructure—Deciding when to Offer Guarantees, Output-based Subsidies, and Other Fiscal Support,” World Bank Working Paper No. 10.
- Merton, Robert, 1977, “An Analytic Derivation of the Cost of Deposit Insurance and Loan Guarantees,” *Journal of Banking and Finance*, Vol. 1, pp. 3–11.
- Mody, Ashoka, 2002, “Contingent Liabilities in Infrastructure: Lessons from the East Asian Financial Crisis,” in *Government at Risk: Contingent Liabilities and Fiscal Risk*, edited by Hana Polackova Bixi and Allen Schick.
- Stickney, Clyde and Roman Weil, 2000, *Financial Accounting: An Introduction to Concepts, Methods, and Uses*, Dryden Press.
- United States Government (2004a), “Analytical Perspectives” available at <http://www.gpoaccess.gov/usbudget/fy05/browse.html>
- United States Government, (2004b) “The Budget System and Concepts,” available at <http://www.gpoaccess.gov/usbudget/fy05/browse.html>