Consultant's Report

Project Number: 49166-001

People's Republic of China
TA 8940: Municipality-Level Public–Private Partnership (PPP) Operational Framework for Chongqing

Public Private Partnerships:
Valuing Contingent Liabilities

Prepared by

Castalia Strategic Advisors

Sydney, Australia

For the Chongqing Finance Bureau

Asian Development Bank

Public Private Partnerships

Valuing Contingent Liabilities

Report to the Chongqing Municipal Government

March 2016

Table of Contents

Appendices

Tables

Figures

No table of figures entries found.

Boxes

1 Introduction

There is inherent uncertainty in contingent liabilities—the event that gives rise to the liability may not occur and even if it does the value of the liability at that time is not clear and is likely to be influenced by many circumstances.

As a result, there are a number of approaches to valuing contingent liabilities.

The approach then should strike a balance between the cost of complexity and the benefits of creating quality information. Our view is that the development of complex probabilistic models does not improve the accuracy or reliability of the calculations underpinning an appropriately sized fund, and that more pragmatic, common-sense approaches serve just as well.

We provide an outline of such a pragmatic approach in this note.

When valuing contingent liabilities, our interest for fiscal management and budgeting purposes is for the **annual flow of funds**—that is the expected annual payments for liabilities crystallising, not the stock—**the absolute value of all contingent liabilities**.

2 Definition of Contingent Liabilities

Contingent liabilities are defined in the International Accounting Standards (IAS) which require disclosure—but not recognition—of such liabilities. Disclosure means that the nature and estimated magnitude of the contingent liability is reported in the notes to an entity's financial statements; whereas recognition means that the liability is included in the entity's Balance Sheet and thus reduces the net worth of an entity.

From IAS 37.10:

> *A contingent liability is:*
>
> *(a) 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; or*
>
> *(b) a present obligation that arises from past events but is not recognised because:*
>
> > *(i) it is not probable that an outflow of resources embodying economic benefits will be required to settle the obligation; or*
> >
> > *(ii) the amount of the obligation cannot be measured with sufficient reliability.*

In applying this to a PPP, the key part of the definition is:

> *"confirmed by occurrence or non-occurrence of uncertain future events"*

This means that to be a contingent liability, while the amount may or may not be certain, the liability isn't crystallised until some defined future event happens (or fails to happen).

That liability for payment must arise and be quantified within the contract—for example a payment on termination or a penalty that results from the failure of an Implementing Agency to perform an obligation specified in the PPP contract

Once that failure or non-performance occurs, the contingent liability crystallises and becomes an absolute obligation for the CA (and for the government). It is at this point that the liability must be recognised—that is appear on the government's balance sheet.

Accounting Standards do not require that contingent liabilities are recognised in the accounts until they are crystallised, but do require disclosure.

2.1 Examples of Contingent Liabilities

Some examples of contingent liabilities and the rationale for them being contingent in terms of the IAS definition are:

- **Termination payments.** These are payments that are specified if a PPP contract is breached, the breach is material and is not remedied. This liability for payment is contingent because the breach has not occurred and in the normal course of events is unlikely to occur, but the amount of liability is certain.

  This means, for example, that an availability payment or subsidy payment is not a contingent liability, but if the payments are not made, it is the failure to pay by the government that could trigger the liability to make the termination payment.

- **Makeup payments or revenue guarantees.** This is where the contract specifies tariffs or user charges in accordance with a set formula, but the tariffs or charges are set or approved by the government or a regulator. If the regulator doesn't increase tariffs by the minimum amount specified or guaranteed in the contract, then the contingent liability—contingent as the regulator hasn't yet made decisions, and the amount is uncertain—becomes a direct liability; and

- **Compensation Payments.** These payments that are defined in the contract if certain events within the control of the government occur. For example, if government builds a toll road close to a passenger rail service and the PPP for the rail concession specifies that the government will not do this for a specified period. These payments are contingent as government hasn't built the toll road and may or may not. While the quantum of such payments may be uncertain and depend on individual circumstances, PPP concession agreements usually set out at least the principles for quantifying such payments.

2.2 These are not Contingent Liabilities

There are many types of payments that arise during the lifecycle of a project that are not contingent liabilities in terms of the IAS definition and should not be treated as such. Typically, these are payments or liabilities that arise as a result of a failure of the IA to properly manage or forecast the costs of its commitments and obligations to the PPP. While these events are unforeseen, they are direct liabilities that are the responsibility of the CA.

It is useful to differentiate between contingent liabilities which arise as a result of an event that has not yet, and may not yet occur, and direct liabilities which are defined in the contract but which may not yet be quantified. Errors in forecasting direct liabilities are not contingent liabilities.

Examples of direct liabilities that are not contingent liabilities in terms of the definition are:

- **Project construction cost overruns as a result of specification changes by CA.** These might arise where the CA has requested changes or variations to the asset during or after construction to improve its service potential. While

clearly this is a liability it isn't a contingent liability and would only arise as a result of inadequacies in the original project design and specifications. Note that, of course, cost overruns arising during the construction period not requested by the CA are almost always the responsibility of the concessionaire with no recourse to the CA

- **Additional costs for the agency to meet its obligations under the contract**. An example of this would be where the CA has a contractual obligation to provide land or rights of way to the concessionaire and this becomes costlier than forecast
- **Penalty payments for an CA breach of the contract.** In some circumstances, the concession contract may stipulate penalties if the CA does not meet its obligations within the time and as specified. An example of this may be where penalty interest is applied for late payment or where there is a delay by the CA in providing interfaces to the PPP project such as a bus transfer terminal for a metro rail transit system.

  Note that this is different to compensation payments—see above—as penalty payments occur when an CA breaches the contract, while compensation payments occur when an CA takes an action contemplated in the contract. In the case of compensation payment, thus, no breach occurs, for penalty payments a breach does occur; and
- **Requirement for additional funds.** There may be instances where, for whatever reasons, CA's approved budget is not sufficient to meet the normal payment obligations of the CA for a project.

While these are all examples of the need for additional payments that were not foreseen at the beginning of the contract, they are not contingent liabilities—they are direct liabilities that have not been appropriately forecast by the CA.

However, as these additional costs must be met by the CA to meet its obligations under the PPP contract they require careful control, monitoring and management to ensure that:

- The failure of the CA to meet its obligations does not lead to a default that might ultimately trigger termination; and
- The additional costs don't result in the project failing to provide value for money. While it is difficult to cancel or amend a project once it is underway, additional costs through variations and the like, while individually small, may materially affect the viability of a project unless total costs are carefully monitored and managed.

3 Approaches to valuation

Exposure to a contingent liability could result in a range of actual cost outcomes—depending on how the underlying risk variables evolve. Different ways of measuring and expressing the value of a contingent liability require different approaches to capturing this variability. These can be broadly grouped into probabilistic- or scenario-based scenario approaches, as described below.

Probabilistic approach (fully quantitative)

The range of possible cost outcomes from bearing a contingent liability can be expressed in terms of an expected value—that is, the probability-weighted sum of all possible outcomes—and measures of variability such as standard deviations or percentile values.

However, the probability and value of payments or costs often depend on a combination of underlying risk variables, each of which can vary independently or in combination, making it difficult or impossible to calculate the expected value directly. Instead, probability distributions for each underlying risk variable can be defined. A risk modelling program can then be used to randomly simulate thousands of outcomes and the resulting cost calculated in each case. The average of these calculated cost outcomes gives an estimate of the expected value of the contingent liability and their distribution (expressed using graphs or percentile values) gives an estimate of the degree of variability around that value.

Scenario-based approach (partially quantitative)

Rather than attaching probability distributions to underlying risk variables, certain set scenarios—that is, specific combinations of risk variables—can be defined, and the resultant cost determined under each scenario. Scenarios could include "base case", "upside", and "downside" values for variables such as exchange rates, or capture the occurrence of a trigger risk event such as default by the private party. The values calculated using this approach do not take into account the likelihood of each scenario occurring.

These two broad approaches differ in the complexity of analysis, the extent of the required inputs and assumptions, and the completeness of the information they provide.

4 A pragmatic approach

The probabilistic and scenario based approaches detailed above are theoretically elegant but complex and rely heavily on detailed data—for example sufficient data to calculate the standard deviation and distribution of the occurrence of individual risks.

In practice such detailed information is unlikely to be available. For this reason, we suggest a more pragmatic approach to valuing the flow of contingent liabilities.

The value of contingent liabilities should be equal to the present value of expected future payments that will made if contingent liabilities crystallise—that is if the PPP fails taking into account the probability of failure.

While there is a high degree of uncertainty about the calculation, there are two key components:

1. The expected net losses to the Government from the failure of each individual PPP. In most cases this would be the value of termination payments should the Government default, less an estimate of the realisable value of the PPP assets that would be acquired.
2. The probability of failure for each individual PPP. The World Bank Private Participation in Infrastructure database has data on more than 10,000 PPPs in 150 low and middle income countries and can be used to provide estimates of failure rates.
3. The total expected losses—the sum of individual losses multiplied by individual probabilities—which is then adjusted for the diversification benefit that would arise.

4. Any adjustment to the total expected losses for any correlation between the individual probabilities of failure—that is downturn in Government fiscal position.

In the following sections we provide an outline of this approach using some indicative data for illustrative purposes only. We provide some sample calculations in Appendix A.

4.1 The Expected Net Losses—the Size of the Liability

The Government's exposure to contingent liabilities for a PPP is broadly the reduction in the value of the total investment made by the private sector concessionaire—that is the total debt and equity—that arises from the event defined as giving rise to a contingent liability—for example termination.

A contingent liability event that resulted from total failure a PPP in the operational stage (such as force majeure or termination by the Government) could at a maximum be valued at the total investment plus costs associated with termination—for example break fees for debt, compensation for future profits and similar costs.

Other contingent liability events are likely to be of much smaller magnitude—for example penalties for late payment, or other failures of the CA to provide appropriate services or interfaces.

Thus, the value payable by the Government on termination is likely to be the maximum liability. While termination is a low probability event, termination payments are likely to be at least several orders of magnitude greater than any other contingent liabilities.

Termination clauses in PPPs typically provide for:

- **Termination by concessionaire**—Government liability limited to outstanding debt, but usually debt holders have step in rights to prevent concessionaire termination
- **Termination as a result of force majeure**—Government liability limited to outstanding debt and unrecovered equity; and
- **Termination by Government or CA**—Government liability limited to unrecovered equity, outstanding equity, break fees and other termination costs, and an allowance for future profits foregone.

In all cases the Government, on payment of the amount specified in the termination clause typically acquires ownership of all rights, intellectual property, and physical assets of the PPP. This means that the actual cost of termination is the difference between the termination payments and the net realisable assets of the PPP. The Government could monetise the value of the PPP assets through a sale or re-concessioning process. The assets and rights acquired could have substantial value and thus reduce the gross liability for termination by the Government.

That magnitude of the liability on termination by the Government varies according to the stages of the PPP:

- Prior to contract award—little or no contingent liabilities
- Between contract award and financial close—contingent liabilities begin to arise
- Between financial close and start of commercial operations—contingent liabilities rise rapidly in proportion to construction costs and reach a maximum just before the start of commercial operations; and

- During commercial operations—contingent liabilities begin to decline as the investors recover their investment over the concession period.

Prior to contract award

Prior to the award of a contract, that is during the PPP development and bidding phases, it is unlikely that any contingent liability for the Government would arise. There may be an undertaking to refund some part of the bid costs for shortlisted investors, but this is a direct liability, not a contingent liability.

It would be unusual for the Government to make any financial commitment to bidders in the event that the Government decides not to proceed with an award of contract.

Between contract award and financial close

However, after the award of a contract to the successful bidder, contingent liabilities begin to arise. The CA and the Government have made binding commitments to the concessionaire. If they fail to meet those commitments, or otherwise terminate the contract, then the concessionaire is entitled to compensation.

Prior to financial close, the concessionaire's costs would consist largely of costs for detailed engineering design, commitment fees for debt, equity raising costs and various legal and administrative activities.

We estimate that for a typical PPP project, a concessionaire's costs up to financial close would low (in the order of 10 percent of the total project cost) and thus this would be the maximum contingent liability.

On termination, the Government would acquire all rights to the project and intellectual property such as the detailed engineering design. Potentially they would also gain access to any debt facilities established by the concessionaire. It is unlikely that these rights would be of any material value so we have ignored them in our estimate of the net contingent liabilities in this stage of the PPP.

Between financial close and start of commercial operations

After financial close, a project's contingent liabilities will rise rapidly as actual construction of the project takes place and reach a maximum at the start of commercial operations.

A contingent liability event that resulted from total failure of a PPP at this stage (such as force majeure or termination by the Government) could at a maximum be valued at the total investment plus costs associated with termination—for example break fees for debt, compensation for future profits and similar costs.

We estimate that for a typical PPP project, the maximum value of the contingent liability up to the commencement of operation would be the total project costs plus an additional premium in the order of 10 percent to cover the costs of termination.

The contingent liability would rise progressively to this point during the construction phase.

On termination, the Government would acquire all rights to the project and all assets. However, it is likely that a partially constructed project would be a relatively low value, requiring considerable costs to recommence construction and complete construction. For this reason, we estimate that the gross contingent liabilities should only be discounted by perhaps 20 percent for the value of partial construction to determine the net contingent liabilities in this stage of the PPP.

During commercial operations

Once commercial operations commence, contingent liabilities would begin to decline as the equity and debt holders recover their investment over the concession period.

On termination, during the operations phase the Government would acquire an operating facility and one that would likely have material value. For any project involving large capital expenditure, once the capital has been suck, the continued operation is likely to be cash flow positive and thus profitable.

This means that the rights and assets acquired on termination would be valuable. We estimate that the gross contingent liabilities during operations be discounted by perhaps 33 percent to determine the net contingent liabilities in this stage of the PPP.

4.2 Probability of Failures

To assess the probability of failure of an individual PPP, we start by looking at average failure rates of PPPs in low and middle income countries. We then apply modifiers to that average rate that takes amount of the characteristics of the individual PPP that might increase or decrease risk over the average.

Average PPP failure rates

The source of data for the average failure rate of PPPs is the World Bank PPIAF database, described below in Box 3.1.

Box 4.1: World Bank PPIAF Database

The Private Participation in Infrastructure (PPI) Database has data on more than 10,000 projects in 150 low- and middle-income countries. The leading source on PPI trends in the developing world, the database covers projects in transport, energy, telecommunications, and water and sewerage. Data cover the contractual arrangements, the sources and destinations of investment flows, and information on the main investors.

The database is a joint product of the World Bank's Infrastructure Economics and Finance Department and PPIAF.

Source: **http://www.ppiaf.org/page/knowledge-center/private-participation-infrastructure-database**

From the database we have extracted the total number of active PPPs—that is under construction, distressed or operational for the water, transportation and energy sectors. We have ignored cancelled projects as they never reach award status and thus never give rise to contingent liabilities.

We have categorised this data for all PPPs in low and middle income countries, in East Asia and South Asia and the Pacific, and China itself.

The resulting failure rates—that is "distressed" projects are shown in Table 4.1.

Table 4.1: PPP Failure Rates

Region	Total PPPs	Distressed PPPs	Rate
All regions	7452	257	3.4%
East & South Asia	2963	15	0.3%
China	1274	0	0.0%

Source: World Bank PPIAF database, March 2016

In the absence of further detailed data on the failure rate of PPPs in China, we suggest using the "All Regions" as the "basic" or average failure rate. This could potentially be increased to be higher than average given that the immaturity of PPP development in Chongqing.

Risk Factors

This basic risk of failure could be increased or decreased by factors relating to the individual PPP project.

Those factors are related to the status of the project and the nature of the project.

We show some indicative adjustments to the average risk in Table 4.2.

Table 4.2: Risk Factors

Basic Failure Rate	3.40%
Project Status	
– Up to financial close—medium risk	3.40%
– Up to COD—high risk	5.10%
– After COD + one year--high risk	5.10%
– After COD+ more than one year—medium risk	3.40%
Other Factors	
- Majority liability in USD	+ 0.2%
- Unsolicited Procurement	+ 0.2%
- Demand Risk (all or majority)	+ 0.2%
- Availability Payment	- 0.2%

We classify medium risk as equivalent to the average or basic risk of 3.4 percent and have increased or decreased it by 50 percent for high and low risk.

To than project risk, we then add or subtract 0.2 percent to account for the specific features of the project:

- **Majority liability in USD or other foreign currency** we assess as high risk as a result of a potential for a currency collapse or currency incontrovertibility
- **Unsolicited procurement** we assess as higher risk as such projects proceed outside of the Government's long term infrastructure development
- The extent of **demand risk** also increases risks in that the likelihood of financial stress is increased if demand projections are unrealistic; and
- Conversely we see a PPP with **availability payments** as low risk.

Diversity & systemic adjustments

Once the size of the liability and the probability for failure has been calculated for each individual PPP project, then the sum of all PPPs should be adjusted by two further factors—diversity benefits and systemic failure.

Diversity adjustment would require discounting the sum of all individual liabilities as the actual liability in any year is likely to be less than the maximum estimated for each PPP. Simultaneous failures are less likely and individual failures may crystallise liabilities less than that assumed in the calculation.

A **systemic adjustment** would increase the sum of all individual liabilities and there is likely to be some correlation between failures of individual PPP projects. They may be a problem with a particular sector that impacts multiple PPPs or the Government may be under fiscal stress.

It is difficult to quantify either of these adjustments and given that the estimates of liability and probability for individual PPPs are high level, it is not clear that introducing diversity and systemic adjustments would materially improve the overall accuracy of the estimate. This is especially so given that they may largely offset each other.

Appendix A: Sample Calculation

	Sample Calculation of Contingent Liabilities													
	Project Name	Cost	Status	Award Date	Start Date	Period	Procurement	$US?	Demand Risk	CL Value	Stutus Risk	Modifiers	Total Risk	Value
1	Light Rail Transit System	$ 655.0	Operational	2000	2000	25	Solicited	No	No	$ 181.6	3.4%	0.0%	3.4%	$ 6.2
2	Metro Transit System	$ 1,442.2	Operational	2015	2015	32	Solicited	No	No	$ 1,075.8	3.4%	0.0%	3.4%	$ 36.6
3	Water Utility Privatisation	$ 7,000.0	Operational	1997	1997	25	Solicited	Yes	Yes	$ 1,293.6	3.4%	0.4%	3.8%	$ 49.2
4	Expressway Project	$ 1,233.89	Construction	2015	2020	35	Solicited	No	Yes	$ 246.8	5.1%	0.2%	5.3%	$ 13.1
5	Expressway Link	$ 444.4	Awarded	2016	2020	35	Solicited	No	Yes	$ 44.4	3.4%	0.2%	3.6%	$ 1.6
		$ 10,775.6								$ 2,842.2				$ 106.6
	Note: Indicative Data Only													

T: +1 (202) 466-6790
F: +1 (202) 466-6797
1747 Pennsylvania Avenue
NW 12th Floor
WASHINGTON DC 20006
United States of America

T: +1 (646) 632-3770
F: +1 (212) 682-0278
200 Park Avenue Suite 1744
NEW YORK NY 10166
United States of America

T: +61 (2) 9231 6862
Level 1, 27-31 Macquarie Place
SYDNEY NSW 2000
Australia

T: +64 (4) 913 2800
F: +64 (4) 913 2808
Level 2, 88 The Terrace
PO Box 10-225
WELLINGTON 6143
New Zealand

T: +57 (1) 646 6626
F: +57 (1) 646 6850
Calle 100 No. 7-33
Torre 1, Piso 14
BOGOTÁ
Colombia

T: +33 (1) 73 44 26 97
F: +33 (1) 73 44 26 01
6, Rue Duret
PARIS 75116
France
---------- www.castalia-advisors.com