Assessing contingent liabilities in public-private partnerships (PPPs)

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Assessing contingent liabilities in public-private partnerships (PPPs)

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Abstract

Public-private partnerships (PPPs) can impose important future cost on the government, which in turn create obligations similar to public debt obligations for financing infrastructure investment. Apart from that, government guarantees, typical in PPP contracts, constitute explicit contingent liabilities. The risk that arises from such guarantees must be transparently valued to assess a country's fiscal profile. In this study, we aim to show that the notion of a PPP as a (set of) contingent claim(s) can also be used to value the PPP public risk. Valuing contingent claims in this manner is important, as it allows us to compare more carefully different set-ups of a PPP. We introduce and analyse the different scenarios that were at the Chilean government's disposal for executing a transport infrastructure project. Our findings reveal that, for the first years of a PPP programme, the burden on the surplus or deficit will be less in the case of the PPP compared to typical public investment. Secondly, the net contingent PPP flows constitute the real effect on the deficit and correspondingly on the public debt and weaken the government's fiscal stance. Finally, we attribute a specific price to the PPP public risk introducing CDS valuation with and without counterparty (government) default.

Keywords: PPP, Guarantees, Public Finance, CDS valuation

JEL classification: H40

1 Introduction

1.1 Public-private partnerships in public policymaking

Public-private partnerships (PPPs) are set between traditional public procurement and full privatization schemes. The production of public goods by the private sector serves various objectives, such as financing fiscal deficits, easing government debt, attracting foreign and domestic investment, liberalizing and deregulating target sectors and improving corporate effectiveness (Megginson and Netter, 2001). PPPs nowadays exist in many advanced and developing countries as a tool to better manage public activities. They are widely implemented in various sectors, such as energy (electricity, gas), water and sewerage, telecommunications, education, health and most commonly, transportation infrastructure (airports, seaports, roads, bridges, rail etc.).

A PPP initiative constitutes a different approach, compared to the case when the government itself invests in producing a good or a service, and finances this investment through government revenues (such as taxation) or via government borrowing. In a PPP, since the private operator is accountable for the start-up capital expenditure of the project, the present capital expenditure of the government remains unaffected. However, the government may be obliged to pay the operator a fee under the PPP contract, or be contractually committed to purchase a predetermined quantity for the specific project or service, thus currently committing to increase its expenditures in the future.

Moreover, PPPs often incorporate explicit contingent liabilities such as: a) obligations to purchase the PPP service or product and b) government guarantees, which take the form of loan guarantees, minimum revenues from services, or ensuring a minimum demand levels. A government guarantee, which is a common feature in a PPP contract, obliges a government to take up an obligation, should a specific event occur and thus constitutes a significant source of public risk.

1.2 Literature and contribution

There is a growing literature that links PPPs and issues, such as fiscal risk, contingent commitments, accounting treatment, classification of the PPP asset and macroeconomic effects.[1] Scholars generally discuss an overall assessment of PPPs, defining them, connecting them to risk transfer and pinpointing the absence of standardized reporting guidelines. The studies cover the aspect of fiscal risk in a framework of government guarantees and the relevant contingent liabilities, many of which arise from PPP agreements. They also refer to PPPs as a method to reverse the declining trend of public investment and stress the imperative need for an internationally accepted accounting treatment and disclosure of PPPs.

Respectively, the key determinants in this process to follow up on are the contingent flows that arise from relevant commitments of the PPP project. In this paper, we focus on the notion of a PPP as a (set of) contingent claim(s), which can also be used to value the public exposures from the PPP. Valuing contingent claims in this manner is important, as it allows us to compare more carefully different set-ups of a PPP. Taking into account risk pricing, we want to investigate the conditions under which governments engage in alternative types of PPPs in order to minimize the net

[1] IMF (2005a), IMF (2005b), IMF (2004a), (IMF 2004b), Hemming (2006), Eurostat (2004), Fourie and Burger (2001), Dewatripont and Legros (2005), Sadka (2006), Navarro (2005), Engel et al. (2008).

negative effects on national debt and to assess the impact of the relevant government guarantees. To do so, we use data from PPPs that were successfully implemented in Chile for developing transportation infrastructure.

The rest of the paper is organized as follows. Section two introduces the Chilean case and the concept of the net contingent flows. In section three, the various scenarios which are used to price the PPP risk are analysed. Finally, section four concludes.

2 Net contingent flows and fiscal implications

2.1 The Chilean case

PPPs were introduced by the Chilean government in the early and mid-1990s in an attempt to attract private capital to support infrastructure investment. The administration realized a programme to finance highways of over 2,000 kilometres with a total investment of US$3.3 billion (Gomez-Lobo and Hinojosa, 2000).

The Chilean PPPs were chosen because of several reasons. First of all, the size of the programme constituted the largest part of the overall public investment and a substantial portion of the country's gross domestic product. These PPPs were therefore very influential, impacting significantly the national accounts. Furthermore, the Chilean PPP scheme was very successful in terms of on-time design and construction development, cost budget accuracy and flexibility when encountering *ex post* problems such as expropriations and the like. Reasons for this success were the programme's straightforward regulatory framework, the concrete structure, the clear bidding process and the steady financing (which was also "protected" by government guarantee provisions). Finally, the validity and reliability of the data of the Chilean PPP projects was a decisive feature in choosing this case study.

Almost 75 per cent of the programme funding for PPPs refers to the main north-south Pan American highway, also known as "Route 5." More specifically, the data include the southern part of the route, which is divided in eight sections and is, in total, about 1,500 kilometres long.[2] All the projects are in full operation, whereas the contracts foresee balanced toll level policy that set roughly equal toll payments in all segments of the expressway.[3] As such, we are able to use an average toll rate for our valuation. Other common features include similar funding level per km and mutual design parameters.

2.2 Guarantees, expected revenues and fiscal balances

The legislature framework in Chile concerning the construction, maintenance and operation of public infrastructure via PPPs incorporated flexible tender procedures, establishment of mutual rights and obligations between the private and the public partner and the use of incentives for private participation (Lorenzen, Barrientos and Babbar, 2004). More specifically, the provision constituted of subsidies, government guarantees and revenue sharing schemes. The guarantees concerned a minimum revenue level that was guaranteed by the government, following the exploitation of road tolls by the private partner(s). On the other side, the

[2] Table 1.A in the appendix summarizes all the data for the Route 5 projects. For simplicity, we do not consider operation and maintenance costs, since they constituted only a small portion of the overall investment for the project.

[3] Average toll per km varies between CH$ 12 and CH$ 13.

government would share project revenues with the private partner in cases when these revenues exceeded specific thresholds which were set within the PPP contracts.

More specifically, the Chilean government initiated the bids with a total revenue guarantee equalling to 70 per cent of the estimated official cost of the project (including investments, operating costs and maintenance costs).[4] Table 2.A in the appendix includes detailed data on the discounted amounts of the guarantees, the expected revenues and the net contingent flows for each project and each year.[5] In the case that the expected revenue from the project is less than the guarantee that is foreseen in the adjudication contracts and their amendments, the remaining amount must be covered by the government. In almost all cases we studied, the guarantee is triggered since the guarantee level is greater than the expected revenue level. The table also shows the net contingent flows for each project, as the difference between expected revenues and guarantees, under the condition that the guarantee is greater than the excepted revenues.

We include these net contingent flows to the actual deficit/surplus of Chile to observe the real effect on the national accounts (data on Chile is obtained from Velasco, 2008). Table 1 shows the initial deficit/surplus for each year, the net contingent flow that is generated from the PPP guarantees and the actual deficit/surplus including these contingent amounts since 2000. This last column thus displays the real effect of the PPP risk which emerges from the guarantees, on the Chilean government deficit/surplus. The net contingent flows start being visible in 2000, when the first guarantees were implemented and either reduce each year's surplus or increase the deficit.

Table 1: Chilean government deficit / surplus deficit and total net contingent flows, million CH$, years 1990-2007

Year	Chilean government deficit/surplus	Total net contingent flow for year	Chilean government deficit/surplus including net contingent flow
1990	234.554	0	234.554
1991	202.020	0	202.020
1992	343.956	0	343.956
1993	273.940	0	273.940
1994	348.149	0	348.149
1995	879.878	0	879.878
1996	685.175	0	685.175
1997	709.336	0	709.336
1998	150.940	0	150.940
1999	-790.491	0	-790.491
2000	-267.082	-877	-267.959
2001	-232.747	-11.615	-244.362
2002	-574.822	-17.834	-592.656
2003	-230.470	-22.728	-253.198
2004	1.244.460	-26.084	1.218.376
2005	3.021.740	-30.844	2.990.896
2006	5.984.100	-35.921	5.948.179
2007	7.551.080	-40.533	7.510.547
Cumulative	**19.533.716**	**-186.435**	**19.347.281**

Sources: 1. Ministry of Finance, Coordinación General de Concesiones, Ministry of Public Works, Santiago, Chile

[4] The 70 per cent (of the official cost) revenue guarantee was chosen due to its direct link with the debt financing of the project. The average debt of the consortium of private partners was 70 per cent of their assets.

[5] Detailed calculations for the expected revenues are available by the authors.

2. Authors' calculations

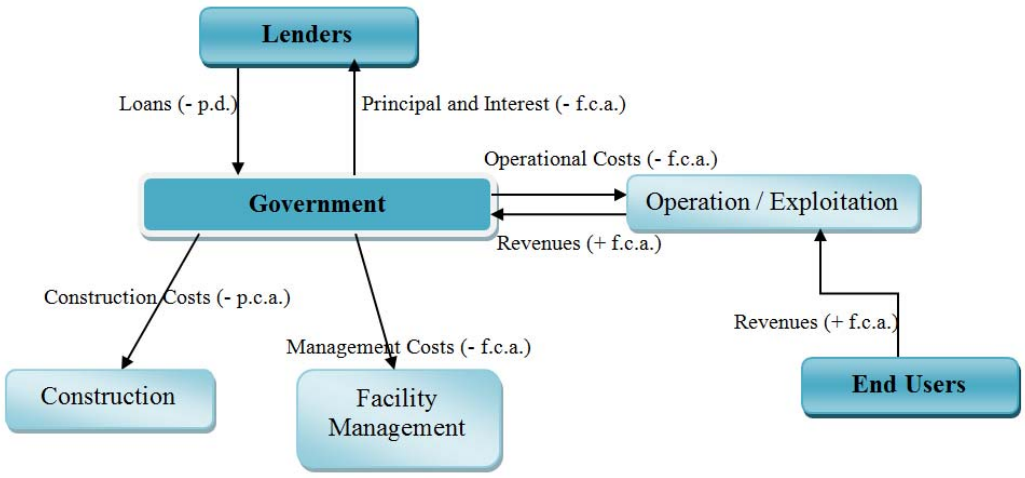
3 Valuing public-private partnership risk: a scenario analysis

Following the calculation of the PPP net contingent flows this part includes the scenario analysis that contributes to the proper valuation of expected cash flows and contingencies that arise from PPP contracts. We will explain four different scenarios, this being the typical public investment, the public private partnership; the public private partnership with credit default swap (CDS) and no counterparty default risk, and the public private partnership with CDS and counterparty default risk.

3.1 Scenario A: Typical public investment / self-finance

Scenario A assumes that the PPP project is *de facto* realized by the government without the participation of the private partner. In figure 1, we develop a flow chart with all the cash inflows and outflows that follow a public investment project, the three basic actors (the lenders, the government and the end-users) and the major procedures (the operation / exploitation, the construction and the facility management). We can observe the positive and negative effects to the public debt and the fiscal accounts (capital and current account) of self-financing an infrastructure project.

Figure 1: Positive and negative effects in public accounts for Scenario A: Typical Public Investment / Self-Finance



Note: p.d.: public debt, f.c.a.: future current account, p.c.a.: present capital account, +: positive effect, -: negative effect

There is a direct effect on the primary balance and the present capital account of the government, since the initial investment cost of the project and its prospective revenue will be included in the deficit or surplus for the years in question. This changes the deficit/surplus of the years following the initiation of the project.

Table 2 presents these figures before and after the investment costs and the project revenues. In principle, the last column of the table shows the effect on the Chilean government deficit/surplus considering that it financed the Route 5 projects. This is the initial deficit/surplus, minus the estimated investment cost, plus the expected discounted revenue for each year. For the years 1995 through 1997 the effect on government surplus is negative; the government surplus decreases due to the total investment cost of seven out of the eight sections of Route 5 that were initiated during

that period.[6] At the same time, there is no expected revenue for these years yet, to counterbalance the negative cost effect. The investment gradually starts to offset after year 1998, when the road is used. For the upcoming years, there is either a decrease in the deficit or an increase in the surplus due to the expected revenues.

Table 2: Chilean government deficit/surplus, investment cost, project revenues, million CH$, years 1990-2007

Year	Chilean government deficit/surplus	Estimated investment cost	Expected project revenue, discounted	Deficit/surplus including the project revenue and cost
1990	234.554	0	0	234.554
1991	202.020	0	0	202.020
1992	343.956	0	0	343.956
1993	273.940	0	0	273.940
1994	348.149	0	0	348.149
1995	879.878	- 72.609	0	807.269
1996	685.175	- 221.386	0	463.789
1997	709.336	- 368.149	0	341.187
1998	150.940	- 345.218	7.101	-187.177
1999	-790.491	0	15.011	-775.480
2000	-267.082	0	16.541	-250.541
2001	-232.747	0	24.912	-207.835
2002	-574.822	0	45.971	-528.851
2003	-230.470	0	43.820	-186.650
2004	1.244.460	0	41.769	1.286.229
2005	3.021.740	0	39.814	3.061.554
2006	5.984.100	0	37.950	6.022.050
2007	7.551.080	0	36.174	7.587.254
Cumulative	**19.533.716**	**- 1.007.362**	**309.063**	**18.835.417**

Sources: 1. Ministry of Finance, Coordinación General de Concesiones, Ministry of Public Works, Santiago, Chile
2. Author's calculations

Consequently, from a debt sustainability point of view, the investment was realized in a time of Chilean prosperity, allowing the government to conclude a large investment without harming the fiscal position in the long run (and probably leading to benefits in the long run). The fact that the Chilean fiscal conditions are improving throughout the period enhances the affordability of such projects within the government budget constraint, not affecting (indirectly) public debt in the short run.[7]

3.2 Scenario B: public-private partnership

The initial investment for every section of the Route 5 projects is financed by the private consortium and constitutes no burden for the government. More specifically, the Chilean government is not obliged to pay any kind of fee to the road operator, and is not obliged to purchase a predetermined quantity after the road is delivered. As a result, neither the present nor the future public expenditure will bear the burden of either the new project or future PPP payments. The primary deficit will remain unaffected in this context. However, the private partner charges toll fees to

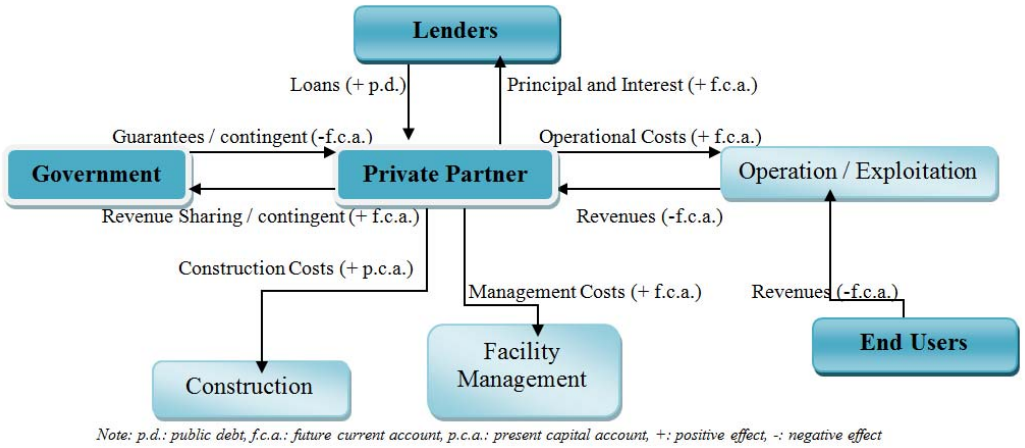
[6] We assume that the year of the award of each project, is the year that the government would fund the investment, if it were to finance the project itself.

[7] The self-finance approach seems to be beneficial in an economy with good fiscal performance. A similar analysis for economies that face difficulties to maintain a sustainable fiscal path would be a good counterfactual scenario and an issue for further research.

end-users. These user fees are a source of revenue that would be collected by the government in the self-finance scenario, raising the government revenue once the road is operational.

Figure 2 shows the positive and negative effects on public debt and the fiscal balances, considering the PPP scenario. The new actor that is added in the flowchart compared to figure 1, is the private partner who now borrows money from an external funder to design, build and finance the project. The private partner undertakes the loans and is responsible for amortization and interest payments to the external lending institute. Alongside, he receives the project's revenue via tolls exploitation and also bears the construction and facility management costs. Moreover, we introduce two new contingent flows for the government, the guarantees with a negative effect on the future current account and the revenue sharing flows with a positive effect on the future current account.

Figure 2: Positive and negative effects in public accounts for Scenario B: Public-Private Partnership (PPP)



Note: p.d.: public debt, f.c.a.: future current account, p.c.a.: present capital account, +: positive effect, -: negative effect

3.3 Scenario C: public-private partnership with CDS / no counterparty default risk

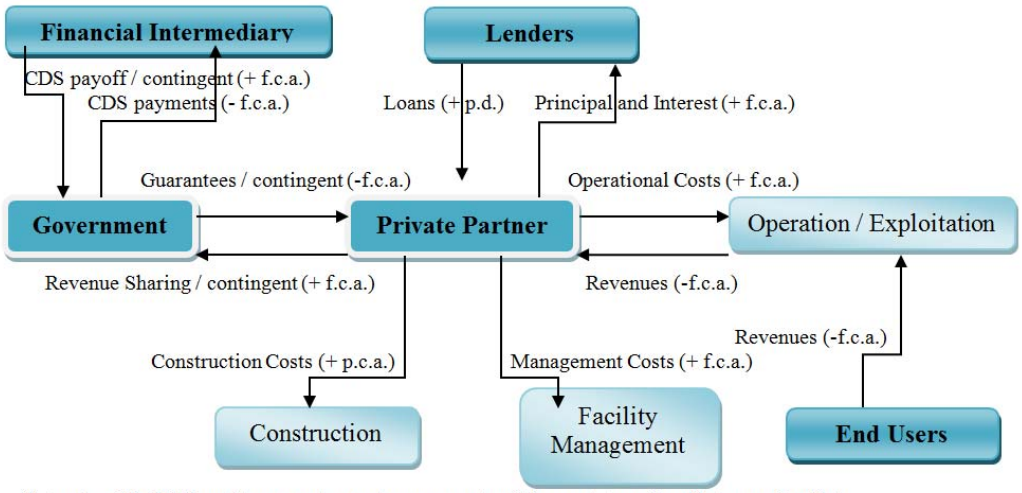
The valuation of the contingencies in the form of PPP guarantees is achieved using derivatives valuation techniques and more specifically the CDS valuation.[8] This scenario assesses the price of the guarantee without considering counterparty risk. This guarantee is directly linked to the credit risk of the project and the CDS can serve as a tool to reduce the credit risk exposure of the government. The credit event in this case is the triggering of the minimum revenue guarantee. If the toll revenue falls behind the specific threshold that is foreseen in the PPP contract, then the government will have to activate the guarantee. However, it can buy protection against this possibility, by insuring via a CDS the contingent amount that it will reimburse the private partner.

The present scenario with the CDS and the effects of the PPP on the debt and on the fiscal balances is shown in figure 3. Compared to the previous scenario of the plain PPP arrangement, most of the cash flows and the basic actors are the same. The four actors are the government, the private partner, the lenders and the end-users, while the flows of payments concerning loans, construction and maintenance costs,

[8] For the valuation of the risk that arises from PPP contingencies, we calculate the payoff from a typical CDS using the methodology and assumptions described in Hull (2006).

revenues and the contingent flows (guarantees and the revenue sharing scheme) have the same direction. We introduce a new basic actor who issues the CDS. This is a financial intermediary, for example an insurance company. There are two flows between this intermediary and the government: a cash outflow from the government - which is the purchaser of the swap - in the form of periodic payments towards the intermediary until the private partner defaults (or until the expiration of the CDS) and a contingent cash inflow towards the government, which is the payoff in the case of the private partner default. This flow of actual and contingent amounts is also applicable in the fourth scenario of a PPP with CDS and counterparty default risk.

Figure 3: Positive and negative effects in public accounts for Scenarios C and D: Public-Private Partnership with credit default swap



Note: p.d.: public debt, f.c.a.: future current account, p.c.a.: present capital account, +: positive effect, -: negative effect

To value the PPP risk via the CDS we first need to address the projects' default probabilities. According to each project's credit ratings we calculate the unconditional default probabilities using an average default rate.[9] We then proceed with computing the CDS as the present value of the expected payoff of the PPP investment minus the present value of the CDS payments made by the government, plus any accrual payments.[10] Table 3 consolidates all calculations of the expected CDS payments, payoffs and accruals.

[9] The rates and respective default probabilities were retrieved from Standard and Poor's "Understanding Standard and Poor's Ratings Definitions." The authors have calculated the relevant survival probabilities.

[10] We assume a discount rate (LIBOR average) of 4,91 per cent, a recovery rate (R) of 40 per cent (typically used for the calculation of a CDS), halfway-year defaults and yearly CDS payments. The present value of the payoff is the discounted value of the probability of default multiplied by (1 – R) for each year of the contract. The expected payments of the PPP are the sum of the discounted values of the probability of survival multiplied by the rate at which payments are made per year. The authors have available the detailed calculations per year and per project for all the aforementioned figures.

Table 3: Expected CDS payments, accruals and payoffs

Project	Expected Payment	Expected Accrual	Expected Payoff
Talca – Chillan	6,9467*s	0,0100*s	0,0120
Santiago - Los Vilos	6,0372*s	0,0480*s	0,0576
La Serena - Los Vilos	5,4581*s	0,0191*s	0,0230
Chillan – Collipulli	4,7432*s	0,0377*s	0,0453
Temuco - Rio Bueno	5,0220*s	0,0008*s	0,0009
Rio Bueno - Puerto Montt	4,8992*s	0,0172*s	0,0206
Collipulli – Temuco	4,1629*s	0,0060*s	0,0072
Santiago – Talca	4,3673*s	0,0063*s	0,0075
Total	**41,6366*s**	**0,1451*s**	**0,1742**

Source: Authors' calculations
Note: The expected payoff is the expected amount that shall be paid in case the private partner defaults

The total expected payments for CDS, adding up all the reference years and projects, are 41,6366s and the total accrual payments are 0,1451s, with *s* being the CDS spread. The sum (41,7817s) constitutes the total of CDS payments for the periods in question, while the total expected payoffs in case the private partner defaults are 0,1742. Equating these figures, gives us the value of *s*: 41,7817s = 0,1742 and s = 0,00417. This implies that the mid-market CDS spread should be 0,00417 times the notional principal or 41,7 basis points per year. In absolute terms, if we consider that the notional principal is the maximum amount of the guarantees that are covered via the CDS, then the mid-market CDS spread is the total discounted values of the guarantees times the spread, so 459.023*0,00417= 1.914 million CH$.[11] This is the price of the risk exposure for the government using the CDS spread as a measure for the guarantee valuation.

3.4 Scenario D: public-private partnership with CDS / counterparty default risk

The last scenario still uses the above valuation to price PPP guarantees and the assumption that the government insures the project via a CDS, but also considers the default risk of the government.[12] This assumption is especially relevant in developing countries with unstable economies. The process and the requisites for the calculations are similar to the case of no counterparty default risk in scenario C.

We use credit ratings for both the reference entity and the counterparty. If the credit index for the reference entity falls below its default barrier before the credit index for the counterparty does so, payments continue up to the time of default with a final accrual payment. If the counterparty defaults first and the credit index for the counterparty falls below its default barrier before the credit index for the reference entity does so, payments continue up to the time of the default, with no final accrual payment. In the first case there is a payoff while in the second case there is no payoff. If neither the counterparty nor the reference entity default, then payments continue for the whole lifetime of the CDS and there is no payoff.

In order to estimate the CDS spread in this case, we have to recalculate the CDS expected payments incorporating this time the default probability of the counterparty, this being the Chilean government. Since the accruals and the payoffs do not apply in the case that the counterparty defaults first, their figures are the same

[11] The discounted values of the minimum income guarantees amount to 459.023 million CH$. This is the sum of the guarantee totals for all projects as they appear in Table 2.A of the appendix.
[12] For example, the government may not meet its contractual obligations in the form of payments, fees or guarantees towards the private partner.

as calculated in Scenario C previously. However, we have to re-compute each expected CDS payment, taking into consideration the default probabilities of Chile. Using the default and survival probabilities of the Chilean government, we obtain a new present value of the CDS payments containing the risk of default from the counterparty.

Table 4: Expected CDS payments including counterparty default

Project	Expected Payment, Discounted
Talca – Chillan	6,9291s
Santiago - Los Vilos	6,0204s
La Serena - Los Vilos	5,4412s
Chillan – Collipulli	4,7273s
Temuco - Rio Bueno	5,0049s
Rio Bueno - Puerto Montt	4,8826s
Collipulli – Temuco	4,1476s
Santiago – Talca	4,3512s
Total	**41,5043s**

Source: Authors' calculations

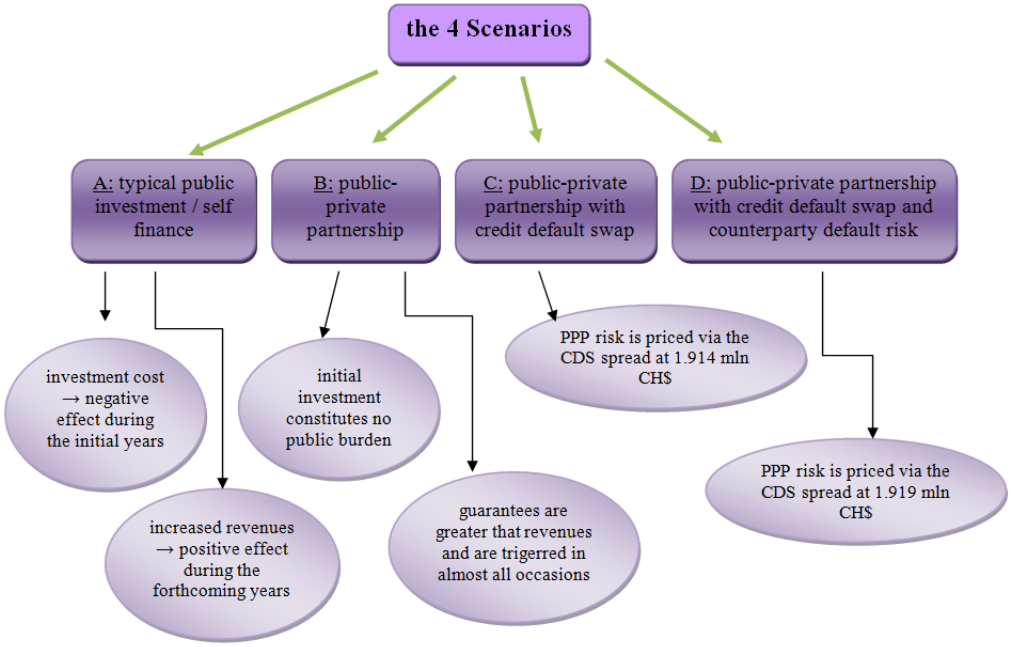
Table 4 shows the expected payments of a CDS including the counterparty (Chilean government) default risk.[13] The total expected payments for this scenario is 41,5043s and, given that the total accrual payments are 0,1451s, the total payments for the CDS with counterparty default risk is 41,6494s. Then, since the total expected payoffs are 0,1742, the CDS spread is 0,00418.[14] In absolute terms, the mid-market spread for a CDS with counterparty default risk is 459.023*0,00418=1.919 million CH$. This is the actual price of the government risk, incorporating the counterparty's probability of default as well. The result is, as expected, higher compared to scenario C because it also incorporates and additional type of risk. However, the difference is minimal since Chile has very high survival probability rates.

The Chilean experience, due to the successful PPP programme in terms of design, development and transparency, provided us with an effective unit of analysis for the application of the scenario based model. In the figure below, we summarize our findings for each of the aforementioned scenarios.

[13] The default and survival probabilities, as well as the detailed calculations for the expected payments incorporating the counterparty default risk are available by the authors.

[14] This means that the mid-market CDS spread should be 0,00418 times the notional principal or 41,8 basis points per year.

Figure 4: Scenario-based model for PPP risk valuation



4 Conclusion

4.1 Using private methods to assess public project risk in PPPs

The main purpose of this paper is to propose a method that can be adapted to any country's PPP programme and evaluate the effect that the PPP risk imposes on the national accounts. The contribution of the paper has two aspects. We introduce a novel finance technique to value the PPP risk and we present the various inflows and outflows that are realized with each different scenario.

More precisely, the four scenarios are described as follows. The first scenario presents the case where all PPP projects are financed by the government as typical public investment. There is a direct effect on the present capital account of the government from the initial investment which is gradually counterbalanced by positive flows from user fees. In the PPP scenario, we introduce the fiscal effect of the net contingent flows for the government, as the difference between expected revenues and guarantees, should the latter be called. In the third and in the fourth scenario, we assume that the government can reduce its risk exposure from the guarantee, by buying protection against the probability of default via a CDS. We calculate the mid-market CDS spread with (fourth scenario) and without (third scenario) considering the government's probability of default. In this way, we evaluate the price of the public risk exposure in a PPP.

4.2 Public commitments and policy lessons

Policymakers must consider that the potential public-side obligations of PPPs, which are difficult to evaluate and often overlooked, are a feature of PPPs that may attribute to incomplete contracting. These commitments constitute by definition future liabilities for the government, should a specific event occur. Governments typically do not concentrate on the risk that comes from default of either the private partner or themselves, when assessing their overall risk profile. However, pricing of this risk is very important in terms of the proper valuation of the public debt because it

influences on debt dynamics. If governments do not consider the risk that originates from contingent commitments, then (new) government debt may not be appropriately assessed. The proposed valuation method gives policymakers the opportunity to capture all negative contingent cash flows that government commitments may cause.

Currently, the financial crisis in Europe already shows that in any developing or developed country, it is likely that financial situations were not utterly and correctly assessed. There is a momentum now that stresses that policymakers and practitioners should monitor national governments better in their financial performance. In the EU, this translated to percentage thresholds for public debts and deficits and the European Commission committed itself to monitoring, as well as penalizing default of the set thresholds. When calculating these debt rates, PPP commitments in case of defaults should be taken into account, as otherwise countries might be able to hide public future liabilities. If anything, the current cases in Europe show that default by countries as well as private partners is likely to occur, if public fiscal balances deteriorate nationally or globally.

The viewpoint of PPP contingencies (and the relevant risk) together with the cash flow analysis address an interesting policy lesson. PPPs are very close to a typical public investment from a government's perspective. This is because, a) explicit contingent obligations that arise from PPPs can be considered similar to sovereign debt commitments that result from public borrowing, and b) project costs in terms of construction and operation or other cash outflows will - at some point in the future – burden the taxpayers. As is clear from our discussion, the proper valuation of the risks involved will ensure that government guarantees strike a balance between making the PPP financially viable, without creating the wrong incentives for the private and/or the public party.

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Appendix

Table 1.A: Route 5 Projects Data

Project, Route 5	Year project awarded	Year of operation	Investment in million CH$	Length in km	Estimated average daily traffic	Duration in years
Talca – Chillan	1995	1998	72.609	192	9.000	10
Santiago - Los Vilos	1996	1999	112.136	218	9.200	23
La Serena - Los Vilos	1996	2000	109.250	228	2.500	25
Chillan – Collipulli	1997	2001	93.924	160	5.900	22
Temuco - Rio Bueno	1997	2001	85.119	172	3.500	25
Rio Bueno - Puerto Montt	1997	2001	88.054	136	5.800	25
Collipulli – Temuco	1997	2002	101.052	163	5.700	25
Santiago – Talca	1998	2002	345.218	266	18.000	25
TOTAL	-	-	**1.007.362**	**1.535**	**59.600**	-

Source: Coordinación General de Concesiones, Ministry of Public Works, Santiago, Chile

Table 2.A: Detailed data on guarantees, expected revenues and net contingent flows for Route 5 projects, discounted values in million CH$, years 1998-2007

Year	Talca - Chillan			Santiago - Los Vilos			La Serena - Los Vilos			Chillan - Collipulli		
	Revenues	Guarantees	Net flow	Revenues	Guarantees	Net flow	Revenues	Guarantees	Net flow	Revenues	Guarantees	Net flow
1998	7.101	0	0	0	0	0	0	0	0	0	0	0
1999	6.769	0	0	8.242	0	0	0	0	0	0	0	0
2000	6.452	0	0	7.857	0	0	2.233	3.110	-877	0	0	0
2001	6.150	10.802	-4.652	7.489	9.477	-1.988	2.129	4.303	-2.174	3.698	4.924	-1.226
2002	5.862	11.443	-5.581	7.138	10.004	-2.866	2.029	4.411	-2.382	3.524	5.053	-1.529
2003	5.588	12.205	-6.617	6.804	10.620	-3.816	1.934	4.553	-2.619	3.360	5.220	-1.860
2004	5.326	12.726	-7.400	6.486	11.018	-4.532	1.843	4.596	-2.753	3.202	5.260	-2.058
2005	5.077	13.544	-8.467	6.182	11.672	-5.490	1.757	4.736	-2.979	3.052	5.423	-2.371
2006	4.839	14.292	-9.453	5.893	12.450	-6.557	1.675	4.915	-3.240	2.910	5.628	-2.718
2007	4.613	14.655	-10.042	5.617	13.261	-7.644	1.597	5.090	-3.493	2.773	5.817	-3.044
Total	**57.777**	**89.666**	**-52.211**	**61.708**	**78.500**	**-32.891**	**15.197**	**35.714**	**-20.517**	**22.519**	**37.324**	**-14.805**

Year	Temuco - Rio Bueno			Rio Bueno - Puerto Montt			Collipulli - Temuco			Santiago - Talca			Total contingent net flow for year
	Revenues	Guarantees	Net flow	Revenues	Guarantees	Net flow	Revenues	Guarantees	Net flow	Revenues	Guarantees	Net flow	
1998	0	0	0	0	0	0	0	0	0	0	0	0	**0**
1999	0	0	0	0	0	0	0	0	0	0	0	0	**0**
2000	0	0	0	0	0	0	0	0	0	0	0	0	**-877**
2001	2.358	3.934	-1.576	3.090	3.036	0	0	0	0	0	0	0	**-11.615**
2002	2.247	4.034	-1.787	2.945	3.119	-174	3.469	6.483	-3.014	18.755	19.256	-501	**-17.834**
2003	2.142	4.156	-2.014	2.807	3.218	-411	3.307	6.690	-3.383	17.877	19.885	-2.008	**-22.728**
2004	2.042	4.201	-2.159	2.676	3.251	-575	3.152	6.746	-3.594	17.041	20.055	-3.014	**-26.084**
2005	1.946	4.324	-2.378	2.551	3.344	-793	3.005	6.951	-3.946	16.243	20.663	-4.420	**-30.844**
2006	1.855	4.483	-2.628	2.431	3.469	-1.038	2.864	7.209	-4.345	15.483	21.426	-5.943	**-35.921**
2007	1.768	4.642	-2.874	2.318	3.595	-1.277	2.730	7.458	-4.728	14.758	22.190	-7.432	**-40.533**
Total	**14.358**	**29.774**	**-15.416**	**18.818**	**23.033**	**-4.269**	**18.527**	**41.537**	**-23.010**	**100.157**	**123.474**	**-23.317**	**-186.435**

Sources: 1. Coordinación General de Concesiones, Ministry of Public Works, Santiago, Chile
2. Authors' calculations

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