# Valuing public-private partnership (PPP) risk: a scenario analysis

Manos Sfakianakis [a, b]

[a] Maastricht Graduate School of Governance, Maastricht University, the Netherlands

[b] Foundation for Research and Technology – Hellas (FORTH), General Secretariat for Research and Technology, Greece

phone numbers: +306944635513, +302810391306

emails: manos.sfakianakis@maastrichtuniversity.nl, sfakm@iesl.forth.gr

**Abstract**

PPPs can impose important future cost on the government, similar to public debt obligations for financing infrastructure investment. Apart from that, government guarantees, typical in PPP contracts, constitute explicit contingent liabilities. In this study, we show that the notion of a PPP as a (set of) contingent claim(s) can also be used to value the PPP risk. We introduce four different scenarios that were at the Chilean government's disposal for executing a transport infrastructure project and analyse the actual and contingent cash flows. We find that there is a positive fiscal impact for the PPP case during the initial years (because the investment cost burdens the private actor) and a negative impact for the years to follow (because of principal and interest payments and foregone revenues). Also, 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 public PPP risk introducing CDS valuation with and without counterparty (government) default.

**Keywords:** government guarantees, net contingent flows, CDS valuation

## 1 Introduction

We define a public-private partnership (PPP) as a contractual agreement for a shift of the supply of a good or a service, or the construction of an infrastructure asset, from the government to the private sector, where efficient risk allocation among the partners, and transparent recording of all government, future and contingent, obligations are of utmost importance. Given that there are numerous definitions of PPPs from different entities (OECD, 2008, IMF, 2004b, EIB, 2004 and Eurostat, 2004) we are providing one which incorporates the effect of public exposure on the national accounts. There are decisive features that characterize a project as a PPP. The private partner a) designs, builds, finances, operates and manages a project; b) transfers the asset back to the public partner; c) receives a stream of payments from the government or charges fees to end users. Other PPP formats include the purchase or lease of an existing government asset by a private actor, with or without the obligation to transfer it back to the public actor.

The remainder of this study continues as follows. First, in section 2, we introduce the details of the Chilean PPP transport infrastructure program. Next, in section 3, we discuss the role of minimum revenue guarantees and expected revenues as parts of the PPP. In section 4, we introduce the different scenarios along which the PPP could have been carried out and, finally, section 5 concludes.

## 2 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 concessions program to finance highways of over 2.000 kilometers with a total investment of US$ 3,3 billion (Gomez-Lobo and Hinojosa 2000). The Chilean PPP experience was chosen because of several reasons. First of all, the size and magnitude of the concessions constituted the largest part of the overall public investment program and a substantial portion of fiscal variables for the years in question, such as the deficit / surplus and the gross domestic product. The program is therefore very influential when assessing the impact on 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). Finally, the

validity and reliability of the data of the Chilean concession program was a decisive feature in choosing this case study.

We proceed with a brief display of the representative PPP projects. Almost 75% of the total volume that was invested through the concessions program 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. The table below shows the main figures and includes an estimation of the average daily traffic.

**Table 1: Route 5 Projects Data**

| Project, Route 5 | Year concession awarded | Year of operation | Investment, in million CH$ | Length in km | Estimated average daily traffic (1996) | 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.*

## 3 Guarantees and expected revenues

The legislature framework in Chile concerning the construction, maintenance and operation of public infrastructure via concessions foresaw the use of incentives for private participation such as minimum revenue guarantees (Lorenzen, Barrientos and Babbar, 2004). Table 2 includes all discounted values for the expected revenues (calculated from table 1 data) and contractual guarantees (derived from the adjudication PPP documents and their amendments) for each section. In any case that the expected revenue from the project is less than the guarantee, then the remaining amount must be covered by the government. In almost all cases the guarantee is triggered. Respectively, the third column for each project shows the net contingent flow as the difference between expected revenues and guarantees. This is the actual effect on the deficit and correspondingly on the public debt, since the government should take into consideration all these net contingent flows in the country's fiscal profile. The last column sums up all cash flows for each year.

**Table 2: Guarantees, expected revenues and net contingent flows per section for Route 5 projects, discounted values in million CH$, years 1990-2007**

| Project | Expected Revenues | Guarantees | Net contingent flows |
|---|---|---|---|
| Talca – Chillan | 37.455 | 89.666 | -52.211 |
| Santiago - Los Vilos | 45.609 | 78.500 | -32.891 |
| La Serena - Los Vilos | 15.197 | 35.714 | -20.517 |
| Chillan – Collipulli | 22.519 | 37.324 | -14.805 |
| Temuco - Rio Bueno | 14.358 | 29.774 | -15.416 |
| Rio Bueno - Puerto Montt | 15.728 | 19.996 | -4.268 |
| Collipulli – Temuco | 18.527 | 41.537 | -23.010 |
| Santiago – Talca | 100.157 | 123.474 | -23.317 |
| **Total** | **269.550** | **455.985** | **-186.435** |

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

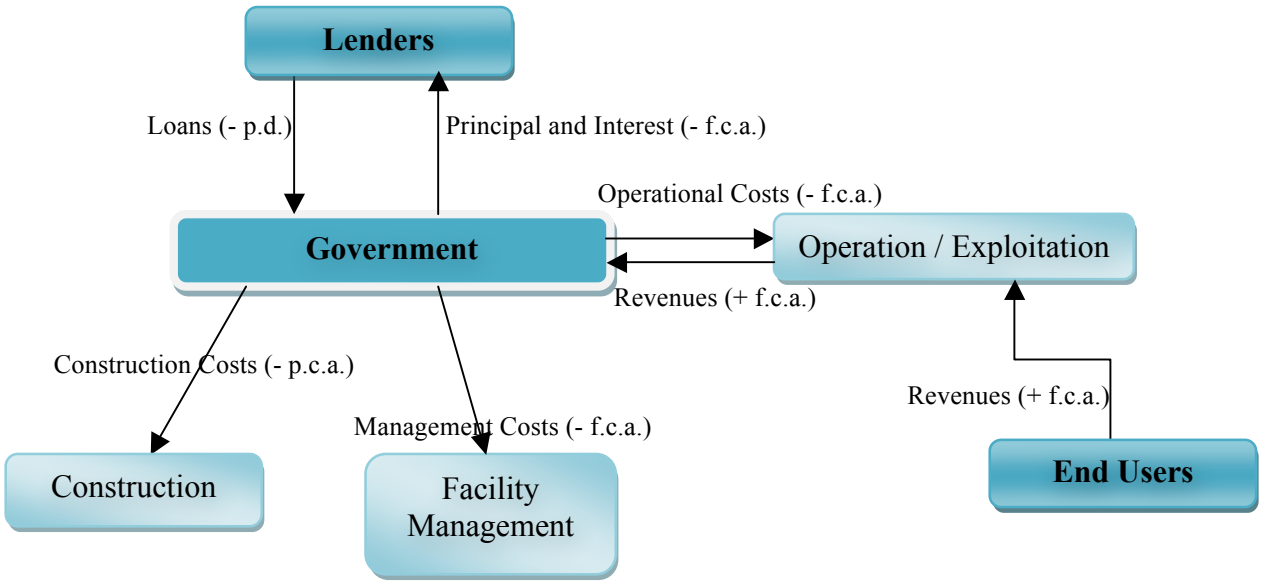
## 4 PPP risk valuation model

This part includes the scenario analysis that contributes to the proper valuation of the contingencies that arise from PPP contracts. We use the data and the results from sections two and three to develop each scenario separately and then we conclude with a general assessment.

### *4.1 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 (lenders, government and project's end users) and the major procedures (operation / exploitation, construction and facility management). We can observe the positive and negative effects of self-financing an infrastructure project to public debt and the fiscal accounts (capital and current account).

**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.*
*Source: Author's contribution.*

Assuming that the Chilean government finances these projects (as pure public investment) via debt, even though public debt increases, the net worth of the government may remain unaffected due to the creation of the infrastructure asset itself. However, 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.

Table 3 presents the surplus / deficit before the investments of the Route 5 projects, the estimated costs incurred with the projects, the total discounted revenues for each year and the surplus / deficit under the assumption that the government realizes the projects via typical public investment. In principle, the last column of the table shows the effect on the Chilean government surplus / deficit considering that it financed the Route 5 projects.[1] For the years 1995 through 1997 the effect on government surplus is negative; the latter decreases due to the total investment cost of seven out of the eight sections of Route 5 that initiate during that period.[2] 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. However, the

[1] It is the initial surplus / deficit, minus the estimated investment cost, plus the expected discounted revenue for each year.
[2] We assume that the year of the award of the concession to the private partner for each project, is the year that the government would realize the investment, if it were to finance the project itself.

revenue for this year is much lower than the estimated cost for the last section of Route 5. As a result the surplus switches into a deficit. For the following years up to 2007, when the government finances no project, there is either an increase in the surplus (years 2004 through 2007) or a decrease in the deficit (years 1999 through 2003) due to the expected revenues.

**Table 3: Chilean government Surplus / Deficit, Investment Cost, Project Revenues, million CH$, years 1990-2007**

| Year | Chilean government Surplus / Deficit | Estimated Investment Cost | Expected project revenue, Discounted | Surplus / Deficit 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*

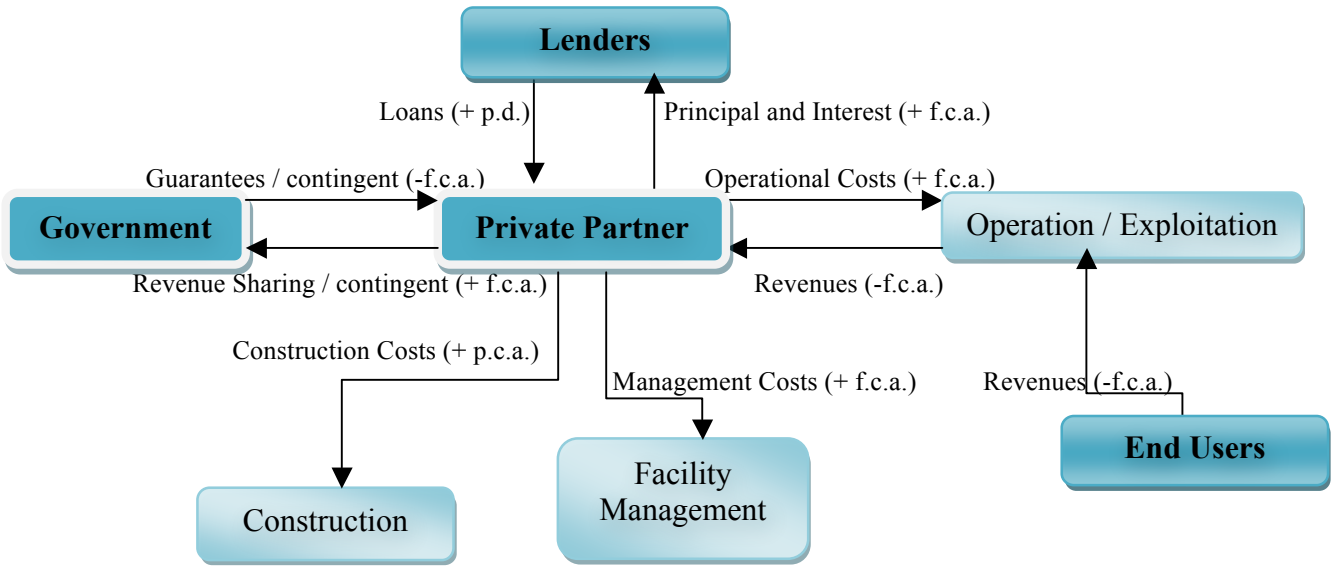
### *4.2 Scenario B: public-private partnership*

The initial investment for every section of the Route 5 projects is financed by the private consortium and constitutes no burden for the government. Furthermore, the Chilean government is not obliged to pay any kind of fee to the road operator. As a result, the present capital expenditure but also the future current expenditure of the government is not affected by concession payments. The primary deficit will remain unaffected in this context. However, the private partner charges toll fees to end-users. These user fees are a source of revenue that would be collected by the government, raising the current government revenue and either increasing the government surplus or decreasing the government deficit for the years of operations. To sum up, the initial cost and the potential revenues of the investment are not included either in the public

expenditure or in the public revenue, but in the expenditure and revenues of the private sector.

We develop Figure 2, which shows the positive and negative effects on public debt and the fiscal balances, considering a PPP scenario vis-à-vis typical public investment. The new actor that is added in this flowchart compared to Figure 1, is the private partner who now borrows to design, construct and finance the project. The private partner undertakes the loans and is responsible for amortization and interest payments. At the same time it reimburses the income of the project in the form of revenue inflows via the road exploitation and bears the construction and facility management costs. Lastly, 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. Both of them are contingent since they depend on specific events to occur.

**Figure 2: Positive and negative effects in public accounts for Scenario B: PPP**




*Note: p.d.: public debt, f.c.a.: future current account, p.c.a.: present capital account, +: positive effect, -: negative effect.*
*Source: Author's contribution.*

In principle, the deficit / surplus of the Chilean government in this scenario is the actual surplus / deficit as it appears in the national accounts. In table 4, we evaluate the effect on the government deficit / surplus by cross-comparing this latter case with the typical public investment.

**Table 4: Chilean government Surplus / Deficit, Typical Public Investment vs. Public-Private Partnership, million CH$, years 1990-2007**

| Year | Difference in Surplus / Deficit, Typical Public Investment minus Public-Private Partnership |
|---|---|
| **1990** | 0 |
| **1991** | 0 |
| **1992** | 0 |
| **1993** | 0 |
| **1994** | 0 |
| **1995** | -72.609 |
| **1996** | -221.386 |
| **1997** | -368.149 |
| **1998** | -338.117 |
| **1999** | 15.011 |
| **2000** | 16.541 |
| **2001** | 24.912 |
| **2002** | 45.971 |
| **2003** | 43.820 |
| **2004** | 41.769 |
| **2005** | 39.814 |
| **2006** | 37.950 |
| **2007** | 36.174 |
| **Cumulative** | **-698.299** |

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

For years 1995, 1996 and 1997 when there was a surplus, the initial cost of almost all of the projects for Route 5 would decrease this surplus at a great amount, totaling around 662 billion CH$, if the investment had been self-financed by the government. Due to the very high cost of the last project (345 billion CH$) this difference is even greater for the next year 1998, when the fiscal condition appears to be more deteriorated, since there is a government budget deficit. This extra public funding would increase the deficit due to the high cost of the investment, while little extra revenue would be generated by a single section in operation (Talca-Chillan). From this year onwards though and as more sections would enter into operation, the government would start collecting revenues from toll exploitation, which would have a positive effect. As we can indeed observe for the period 1999-2007, the differential is positive.

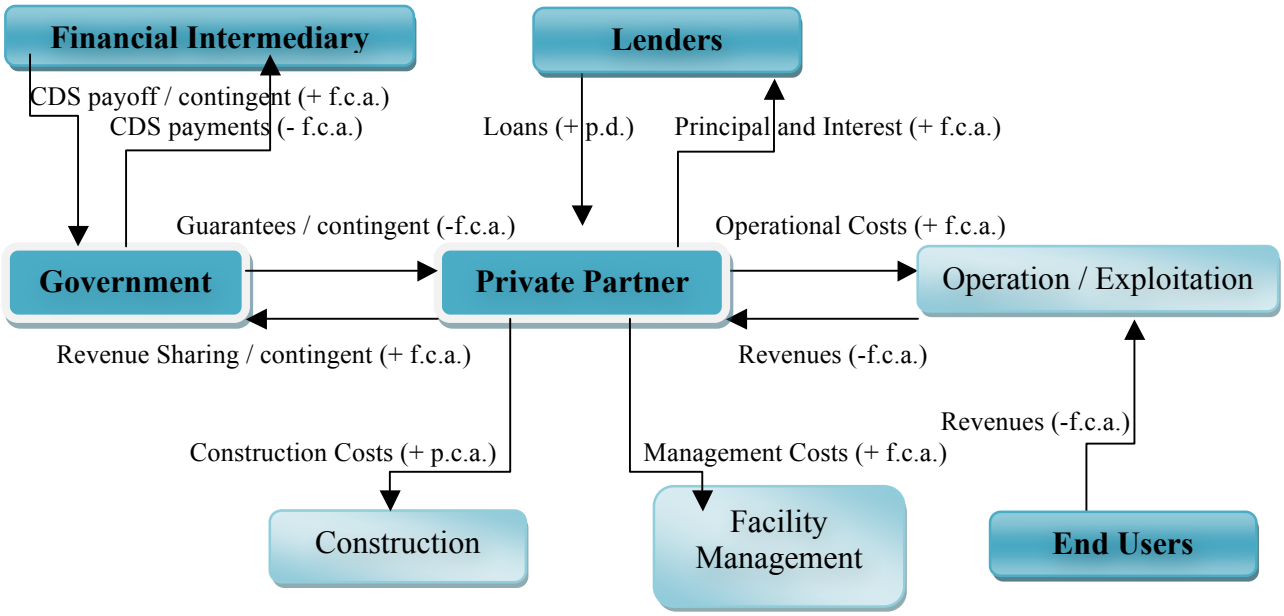
### *4.3 Scenario C: public-private partnership with credit default swap / no counterparty default risk*

The valuation of the contingencies in the form of PPP guarantees is achieved using derivatives valuation techniques and more specifically the credit default swap (CDS) valuation (Hull, 2006). This scenario assesses the price of the guarantee

without considering counterparty risk. 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 of default, by insuring via a CDS, the contingent amount that it will reimburse the private partner.[3]

The present scenario (and also scenario D) with the credit default swap and the effects of PPP flows on the debt and on the fiscal balances is shown in Figure 3.

**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.*
*Source: Author's contribution.*

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, 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. There are two flows between this intermediary and the government: a cash outflow (periodic payment) from the government[4] and a

[3] The application of CDSs is not limited only to revenue guarantees. It can also be extended to other cases of government contingencies and for a wider range of PPP projects.
[4] Until / if the private partner defaults or until the end of the PPP contract, if the private partner does not default.

contingent cash inflow (the payoff) towards the government in the case of the private partner default.

After calculating the default and survival probabilities (Standard & Poor's, 2009a), we compute the CDS spread through the present values of the expected payments and the expected payoffs.[5] Then, the value of the credit default swap is the present value of the expected payoff minus the present value of the CDS payments made by the government. The expected payments will be the total of the discounted annual values of the probability of survival times the rate at which payments are made per year. To this amount, we must add the sum of the final accrual payments which are again calculated via default probabilities. These two amounts constitute the total present value of the expected payments of the swap. Finally, the present value of the payoff is the discounted value of the probability of default times 1 – R (where R is the recovery rate) for each year of the contract. In this way, we obtain the CDS spread for the government insurance against the possibility of default by the private partner. Table 5 consolidates all calculations of the expected CDS payments, accruals and payoffs.

**Table 5: Expected CDS payments, accruals and payoffs, Route 5 projects**

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

*Source: Author's calculations*

The total expected payments adding up all the reference years and projects are 41,6366s and the total accrual payments are 0,1451s. Their sum, which is 41,7817s (41,6366s + 0,1451s) constitutes the total CDS payments for the period in question. Finally, the summation of all expected payoffs is 0,1742. Equating the two amounts of payments and payoffs will give us the CDS spread for the period in question: 41,7817s = 0,1742 → s = 0,00417. This means that the mid-market CDS spread

[5] We assume a discount rate (LIBOR average) of 4,91%, a recovery rate of 40%, halfway-year defaults and yearly CDS payments.

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[6] times the spread, so 459.023*0,00417= 1.914 million CH$. This is the price of the risk exposure for the government using the CDS spread as a measure for the guarantee valuation.

### *4.4 Scenario D: public-private partnership with credit default swap / counterparty default risk*

The last scenario uses the above valuation to price PPP guarantees and the assumption that the government insures the project via a credit default swap, but also considers the counterparty default risk of the public entity.

We incorporate credit ratings for both the reference entity and the counterparty (Standard & Poor's, 2009a). 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 life of the credit default swap and there is no payoff.

In order to calculate the CDS spread, 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 calculation is the same as computed in Scenario C. However, we have to re-compute each expected CDS payment, taking into consideration the default and survival probabilities of a Chilean government bond.

[6] Amounting to 459.023 million CH$ as computed by the author from the adjudication documents.

**Table 6: Expected CDS payments including counterparty default, Route 5 projects**

| 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: Author's calculations*

Table 6 shows the expected payments of a CDS including the counterparty default risk by the government. 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 41,5043s + 0,1451s = 41,6494s. Then since the total expected payoffs are 0,1742, the CDS spread for the period in question is given by: 41,6494s = 0,1742 → s = 0,00418. This means that the mid-market CDS spread should be 0,00418 times the notional principal or 41,8 basis points per year. In absolute terms, the mid market spread for a CDS with counterparty default risk is the total discounted values of the guarantees - as the notional principal - times the spread, so 459.023*0,00418= 1.919 million CH$. This is the actual price of the risk that the government takes as measured via a CDS, incorporating the counterparty's probability of default.

## 5 Conclusion and future research prospects

The Chilean experience, due to the successful PPP program in terms of design, development and transparent regulation, provided us with an effective unit of analysis for the application of the scenario based model. In Scenario A, during the initial years of the PPP program, there is a negative effect on the government surplus, because of the primary investment cost of many projects and with limited concurrent revenue cash inflows (since the projects were in no or early operation). For the years to follow, when no start-up investment is financed by the government, there is either an increase in the surplus or a decrease in the deficit, due to increased PPP revenues. In Scenario B, we introduce the aspect of net contingent flows through the revenue guarantee scheme. In almost all cases, the guarantee is triggered since the relevant amount is

greater than the expected revenue. These contingent flows are the real effect on the deficit and correspondingly on the public debt and weaken the fiscal position of the government.

The valuation of the contingencies in the form of PPP guarantees is achieved using derivatives (CDS) valuation techniques in the last two scenarios. We consider as the notional principal, the maximum discounted amount of the guarantees that are covered via the CDS. We then compute the mid market CDS spread excluding and including counterparty (government) default. The risk price in the latter case is higher, since the guarantee - covering the government's default as well - is now more "expensive."

On this framework, we propose three paths for future research. Firstly, the valuation all future direct and indirect public commitments can be supported by the development of a solid database of public contingent PPP obligations on country (or even EU) level. To this effect, we will be able to apply more sophisticated finance methodologies. Secondly, apart from capturing demand risk through the guarantee pricing, we can also evaluate other types of PPP risk utilizing similar techniques. For example, supply risk can be identified through construction and operation discrepancies, financial risk can be estimated from fluctuations of risky variables such as interest and exchange rates and residual value risk can be approached by asset valuation principles. Finally, we propose the tracing of transport infrastructure PPPs as a portfolio of projects. This will allow the treatment of a PPP program as an infrastructure portfolio and the implementation of simple methods from the relevant portfolio theory to assess the PPP's (social) return and risk.

## References

Akitoby, B., Hemming, R. & Schwarz, G., 2007. "Public Investment and Public-Private Partnerships," *International Monetary Fund Economic Issues Series*, 40, International Monetary Fund, Washington D.C.

European Investment Bank (EIB), 2004. "The EIB's Role in Public-Private Partnerships (PPPs)," *European Investment Bank (EIB)*, Luxembourg

Eurostat, 2004. "Treatment of Public-Private Partnerships," *News Release No. 18*, Brussels

Gomez-Lobo, A. & Hinojosa, S., 2000. "Broad Roads in a Thin Country," *World Bank Policy Research Working Paper*, No. 2279, the World Bank, Washington D.C.

Hemming, R., 2006. "Public-Private Partnerships, Government Guarantees and Fiscal Risk," *International Monetary Fund, Fiscal Affairs Department*, International Monetary Fund, Washington D.C.

Hull, J., 2006. "Options, futures, and other derivatives," 6th edition, *Chapter 27: Credit Derivatives*. New Jersey: Prentice Hall

International Monetary Fund (IMF), 2004a. "Public Investment and Fiscal Policy," *International Monetary Fund, Fiscal Affairs Department, Policy Development and Review Department*, International Monetary Fund, Washington D.C.

_____, 2004b. "Public-Private Partnerships," *International Monetary Fund, Fiscal Affairs Department*, International Monetary Fund, Washington D.C.

Lorenzen, C., Barrientos, M. E. & Babbar, S., 2004. "Toll Road Concessions: The Chilean experience," *World Bank PFG Discussion Paper Series*, No. 124, the World Bank, Washington D.C.

Navarro, A., 2005. "The Treatment of Public-Private Partnership Assets in the GFSM 2001 Framework," *IMF Research Paper*, International Monetary Fund, Washington D.C.

Organization for Economic Co-operation and Development (OECD), 2008. "Public-Private Partnerships: In Pursuit of Risk Sharing and Value for Money," *OECD Publications,* Paris

Standard & Poor's, 2009a. "Standard and Poor's Ratings Definitions," 30/04/2009, *www.standardandpoors.com*, New York

_____, 2009b. "Understanding Standard and Poor's Ratings Definitions," 03/06/2009, *www.standardandpoors.com*, New York

Velasco, A., 2008. "Public Finance Report 2008," Ministry of Finance of Chile, *www.hacienda.gov.cl*, Santiago