

Working paper



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The Promise and Peril of Public- Private Partnerships

Lessons from the
Chilean Experience



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Executive Brief

1. This paper uses the experience of Chile and other developing countries to examine the benefits and pitfalls facing a country that embarks on a wide-ranging PPP program.
2. Chile has one of the most successful PPP programs among developing countries. Operational investments reached US\$ 11 billion by 2007 and there are several additional billions under construction or soon to be awarded. These investments have substantially improved the infrastructure and reduced transport costs. Nevertheless, in the past it has had to modify its legislation and approach to PPPs twice, to deal with problems related to PPPs.
3. The advantage of PPPs is that they bundle investment, operations and maintenance, thus reducing life-cycle costs of an infrastructure facility. In the case of highway PPPs, the continuous maintenance of the road is the main advantage.
4. The first problem that faces a prospective user of PPPs is that, contrary to intuition, they do not provide additional resources. Either the investment must be repaid through availability payments and thus the country incurs the same obligations as under a loan. Alternatively, the resources are derived from user fees, and in that case the government could potentially have asked for a loan and built the project, and then would have utilized the user fees to pay for the loans. In both cases, no new resources are generated. Of course, the incentive structure of PPPs and government provision is different, and this provides the advantages and problems of PPPs.
5. Another important problem is that the large increase in public infrastructure activity associated to PPP programs can lead to organizational problems in the PPP unit. In Chile they eventually to a corruption scandal that brought an end to the PPP process for several years, while reforms were carried out.
6. Renegotiations of contracts are a third important problem. In Chile, changes to the original contracts represented 26% of total PPP investments. Since these renegotiations are bilateral, without the element of competition present in the initial award of the PPP, they are expensive and have serious consequences on the sector. These include vulnerability to corruption as well as lack of incentives for correct design of the projects by the Public Works Authority. Renegotiations are necessary in long term contracts such as those of PPPs, but they should not be endemic.
7. This paper describes a series of recommendations in order to reduce the problems observed in Chile, as well as, even more so, in other developing and developed countries.

These include: i) Clear rules of the game, including specific legislation covering independent conflict resolution mechanisms; ii) Cost benefit analysis of all projects, and a hurdle rate for approved projects, specially those that require government payments; iii) Projects have to be in final form before they are awarded, in order to reduce the scope for conflicts; iv) There should be only one principal in those projects in which more than one ministerial bureaucracy is involved; v) There should be a well designed bidding process, with technical and financial qualification rounds before proceeding to a simple economic bid as the award condition. There are other important recommendations, which because of their more specialized character are described in the text of the paper.

8. Finally, the paper suggests that multilateral aid directed at public investment should be partly directed at PPPs, because of the intrinsic advantages of PPPs in many cases, because the multilaterals can leverage their funds, and finally, because they may be more effective at controlling and supervising the behavior of PPP firms.

1 Introduction

The object of this paper is to describe the Chilean experience with PPPs and use it to derive lessons that might be applicable to Rwanda. Chile is an interesting example of relatively successful use of PPPs. Moreover, Chile has one important point of similarity with Rwanda, namely the intrinsically high transport costs to the relevant demand centers. For this reason, Chile has made it an objective of its policy to reduce internal and border (airports, seaports) transport costs in order to reduce this disadvantage. In other respects Chile is different from Rwanda, with a longer independent history, a wealthier economy and higher human development indexes, given that it is a high middle-income economy. Another important characteristic of Chile, and which will become important below, is that corruption levels are low: in fact it is perceived as less corrupt than many European countries, including France.

The Chilean experience with PPPs began quite early and has had a profound impact on the economy, by providing infrastructure of good quality that has reduced internal and border transport, thus minimizing the geographic disadvantage of Chile's location. Nevertheless, the experience has not been free of problems, and as described below, the expansion of PPPs led to the corruption in the PPP unit, the fall of the Public Works Minister and the dismissal and trial of the chief officers of the PPP unit. It has taken several years for the system to recover from that experience. Other important problems are the extent of contract renegotiations, which increase the effective cost of projects, and the lack of independent supervision of PPP contracts and their modifications.

Other Latin American countries have been less successful with PPPs. Argentina changed the relevant legislation so often that it became impossible to know whether the private parties gained or lost, but eventually they were all expropriated by the government, putting an end to the experiment in Argentina. As Argentina, at the same time, expropriated most foreign investments in public services, this has deterred most foreign investment in Argentina. In Mexico, an improvised PPP plan eventually cost taxpayers about US\$12 billion. Only now, under a new PPP law, Mexico seems to be doing well with PPPs. In Colombia, the first PPP Law led to many problems, and the country is now undergoing the fourth incarnation of PPPs, which finally appears to be successful. This last two cases provide another rule: there is a lot to be gained by experience, both internal and from other countries.

There is very little information about PPPs in other countries with developed PPP sectors, except for the UK. In that country, it appears that the Private finance Initiative was designed to keep public investment projects outside the public balance sheet, thus allowing the country to comply with the Maastricht Treaty while not altering its public investment commitments.¹

¹In joint work (with E. Engel and A. Galetovic) we have concluded that the concept of Value for Money (VFM)

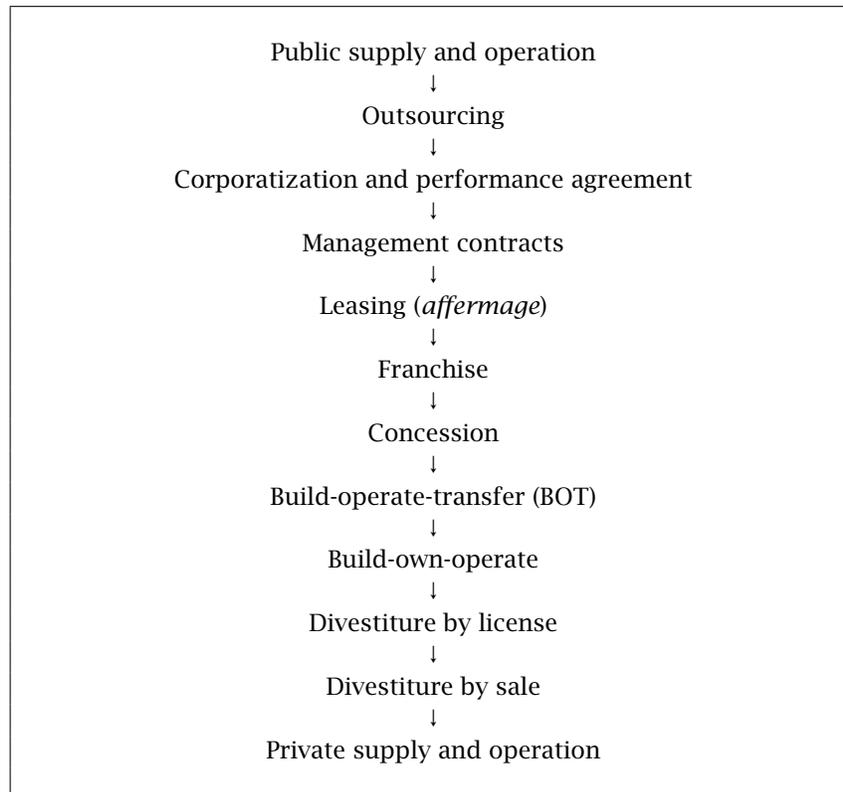
1.1 What is a PPP

While the broad concept of infrastructure comprises telecommunications, energy, sanitation, transport and other sectors, I will only consider issues related to construction infrastructure: road and air transport infrastructure, schools, hospitals, etc and similar projects. Telecommunications, the water and the electric sector can be left to be provided by the market, or by regulated natural monopolies.

There exist three broad approaches to provide infrastructure, which we denote by traditional (or public) provision, public-private partnerships and privatization. None is better than the alternatives in all situations. Depending on the type of infrastructure and the degree of institutional development in a country, the best choice to provide a specific type of facility varies among all three.

There are many different contractual arrangements, some of which are shown in Table 1, based on Guasch (2004). I will use the terms PPP, concession and franchise interchangeably.

Table 1: Types of private participation in infrastructure, from Guasch (2004)



is manipulable, as it depends on several parameters that can be adjusted to obtain the desired results.

Definition While there is no unique definition of a PPP, normally there is participation of the public and private sector, and a contract determines the way in which risk is shared among the two parties. The U.S. National Council for Public-Private Partnerships defines a PPP as

“a contractual agreement between a public agency (federal, state or local) and a private sector entity [whereby] the skills and assets of each [...] are shared in delivering a service or facility for the use of the general public. In addition [...], each party shares in the risks and rewards potential in the delivery of the service and/or facility,”

The Canadian Council for Public-Private Partnerships defines a PPP as

“a cooperative venture between the public and private sectors, built on the expertise of each partner, that best meets clearly defined public needs through the appropriate allocation of resources, risks and rewards.”

The defining characteristic of a PPP, compared with the traditional approach to the provision of infrastructure, is that it bundles investment and service provision into a single long term contract. For the duration of the PPP contract, which can last for thirty or more years, the concessionaire will finance, build, manage, maintain and control the infrastructure, and will be compensated for these services. The remuneration consists of a combination of user fees and government transfers, which may include subsidies, guarantees, shadow fees and availability payments. By contrast, under the traditional model, the private firm that builds the project has no responsibility over its long term performance after the relatively short term construction warranty has expired. We differentiate between an operations and maintenance contract and a PPP because under a PPP there is a large initial sunk investment which changes the incentives as compared to the case of an O&M contract. This means that the private sponsor only starts to make profits towards the end of the contract. This is shown in Figure 1, which describes the flows of investment debt, revenues and profits over time.²

2 Chile: A brief economic and geographic description

Any analysis of infrastructure in Chile must set out some of the defining characteristics of the country, both geographic and economic.³ Chile is a middle income country with a PPP

²The figure assumes initial investments of (1.2, 1, 1, 0.7), an initial repayment of 0.5 in period 5, growing at 3.5% annually, a 5% growth rate in traffic beginning in the 5th period at 0.7 and an interest rate of 12%.

³This data from Wikipedia or the WDR.

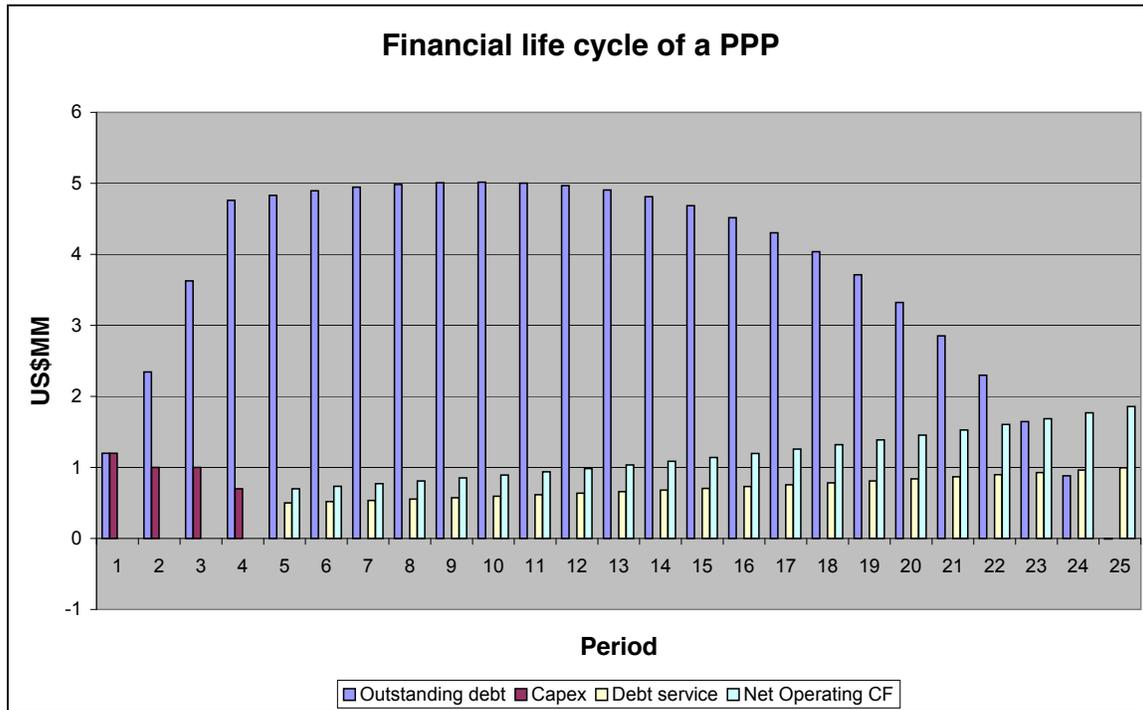


Figure 1: Time Profile of Financial Flows

per capita GDP of US\$ 14,939 (and nominal US\$ 12,285) as of 2010. It has high degrees of income inequality, with a high HDI of 0.783. The population is approximately 17 million, with 85% living in urban areas. International trade (including services) represents about 50-60% of GDP and exports are concentrated in mining, agriculture (fruit and wine), forestry products, fish and services. The country is separated from its neighbors by huge mountain ranges (east), thousands of kilometers of desert (north), the Pacific (west) and by the South Pole to the South so it is isolated and faces large international transport costs. About 8% of land is arable, the rest being dry desert, cold tundra or mountains. For this reason, almost 85% of the population lives close to the Central Valley or on the coast of that region. This corresponds to a fraction of the central map in Figure 2 (they are all on the same scale). Hence, the population density, considering only arable areas, is relatively high compared to other Latin American Countries. The country is highly centralized, with Santiago having 40% of the population and a somewhat higher percentage of the national product.

In brief, Chile is in an intermediate position in regards to development. In other aspects, Rwanda and Chile have some comparable aspects: both countries are at the top of their continents in (relative lack of) corruption.

In terms of its guiding economic principles, Chile is distinguished by an almost totally privatized economy. It has constitutional provision that prohibits State ownership of pro-

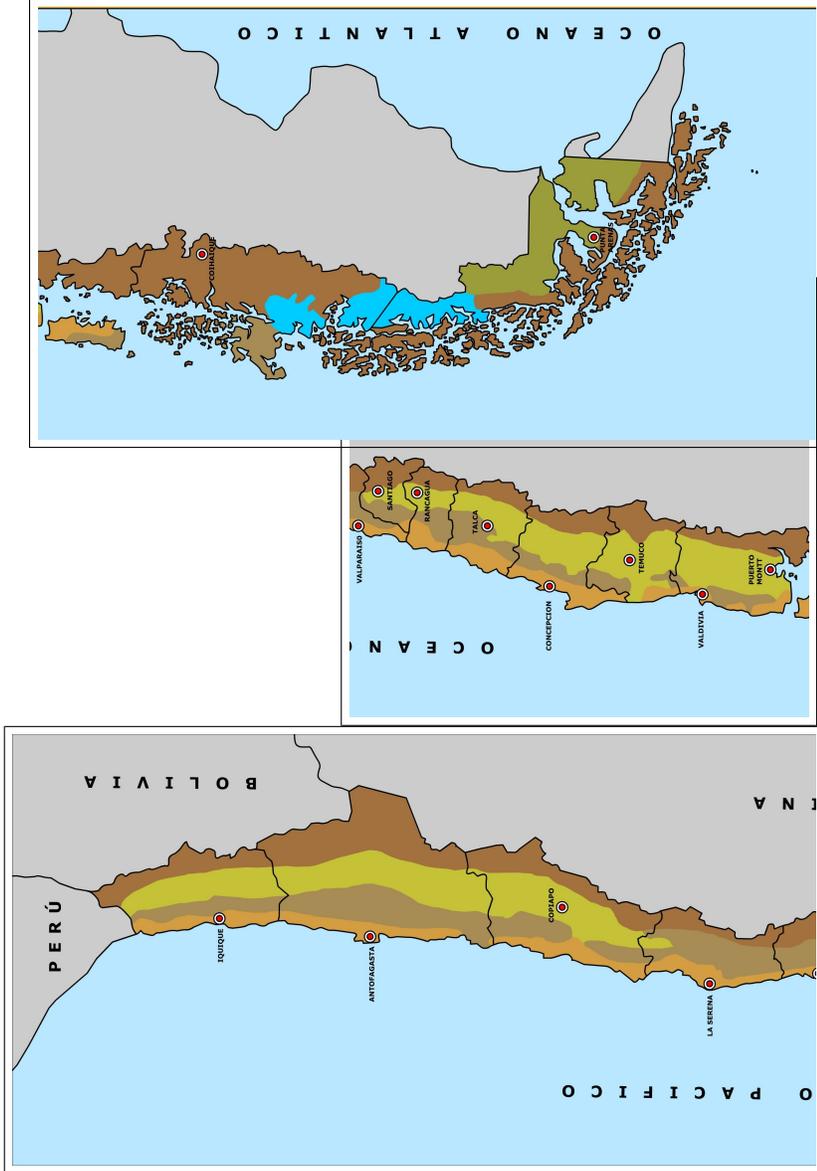


Figure 2: Map of Chile and its central section

Table 2: Comparison variables France, Chile and Rwanda

Name of variable	France	Chile	Rwanda
Literacy rate%	100	99	70
Enrollment tertiary ed.%	55	52	4
PPP GDP capita (US\$)	33,678	14,939	1,148
Exports % of GDP	23	38	9
Rural access to improved water%	100	75	63
Cars per 1000	498	103	2
Corruption Index	25	21	66

Source: World Development Report data website.

ductive firms, except those allowed by specific legislation.⁴ The tariffs are uniform and low at 5%, with the exception of sugar and wheat, which have special protection, specially the first. Moreover, the country has signed Free Trade Agreements with the US, Canada, Mexico, Japan, the EU, the EFTA, South Korea, and other countries representing 90% of its trade, so the average effective tariff is less than 1%. The State does not intervene in the economy, except as a regulator of sectors that are natural monopolies, as a provider of some public goods (research funds and similar), and by the use of means-tested subsidies to individuals, which are very important in the economy.

The private pension funds and the life insurance companies, both created by a 1982 Law, generate large pools of long term savings that can be invested in bonds issued by large projects, such as PPPs.

In general, the guiding principles of non-discrimination and means-tested subsidies to demand have served the political economy well. They have reduced lobbying by private firms for special favors, and the associated possibility of corruption. By redistributing resources efficiently to those who need it most, they also provide support for the continuance of the current, fairly successful economic system.

3 About concessions in Chile

Chile has, by now, a mature and successful highway, seaport and airport concession system, specially when compared to the countries described above. Nevertheless, there have been problems, most notoriously including the magnitude and generality of renegotiations of the original contracts (see Table 3) and episodes of corruption and excess spending.

⁴The State still owns a State Bank (4th ranked), one of the largest copper companies in the world (with 30% of Chile's copper production), the only oil refining company (but refined products can be imported freely), the failing passenger railway company, the successful but non-profit-making Santiago subway and a few additional and relatively unimportant enterprises, most of them for historical reasons. Seaports are state-owned but privately operated, the State acting as a landlord.

3.1 History

In 1991 congress passed a law that allows the government to franchise most public works, including roads and airports.⁵ Under the original law (slightly modified in 1993), 8 projects were awarded.⁶ However, there were several deficiencies in the original legislation that were remedied by the Law N 19.460 of 1996. With the reformed Law, by the end of 2007, 26 highways, 10 airports, 10 public seaports, and several other projects had been concessioned to private firms that invested in, operated and maintained the infrastructure facilities. The total cumulative investment in 50 concessions that had been awarded by the Ministry of Public Works (MOP), is summarized in Table 3, and corresponds to about US\$11.3 billion, about 10% of current Chilean GDP.⁷ Around 88% of that amount has been invested in highways. Since 2008, an additional large number of projects have been auctioned. In 2010, in response to the realization that there were problems with the 1996 legal framework, a major reform introduced additional changes to correct the perceived deficiencies in the system (see below), which has not reduced the interest of firms in the new concessions.

Table 3: Main characteristics of the Chilean PPP system(UF)

	Budgeted cost	Total renegotiated value	Total investment	In-vestment	Fraction of total	Number of works	Fraction of total	Average length of franchise
Ruta 5	71.885.711	20.544.456	92.430.167	0,33	8	0,16	23,8	
Interurban highways	52.951.424	10.453.407	63.404.831	0,22	13	0,26	27,7	
Urban highways	60.613.607	33.288.928	93.902.535	0,33	5	0,1	31,6	
Highways	185.450.742	64.286.791	249.737.533	0,88	26	0,52	27,3	
Airports	8.798.114	1.202.048	10.000.162	0,04	10	0,2	13,1	
Jails	7.414.824	2.661.785	10.076.609	0,04	3	0,06	22,5	
Reservoirs	4.131.579	413.094	4.544.673	0,02	2	0,04	27,5	
Transantiago	4.884.764	645.599	5.530.363	0,02	5	0,1	15,8	
Public Infrastructure	4.243.082	24.153	4.267.235	0,02	4	0,08	23,2	
Other concessions	29.472.363	4.946.679	34.419.042	0,12	24	0,48	18,8	
Total or average	214.923.105	69.233.470	284.156.575	1	50	1	22,7	

Source: EFGH 2008. Note: Currently, 1UF=US\$ 43.

Franchises must be awarded in competitive auctions open to any firm, national or foreign. The law is quite flexible, leaving ample room to adapt the franchise contract to the requirements of each project. In particular, the tendering variables can include the following: user fees, subsidy from the state, duration of the concession, income guaranteed by

⁵DFL 164 of 1991. The Seaport Law N. 19.542 of 1997 allowed franchises on seaports.

⁶Tunnel El Melón in 1993; Camino de la Madera in 1994; Acceso Norte a Concepción, Ruta Santiago-San Antonio, Nogales-Puchuncaví and Ruta 5, Talca-Chillán in 1995; the El Tepual airport and the Santiago Airport Access in 1996.

⁷This figure does not include seaports, which are concessioned in a separate program. It also does not include waterworks, sewage treatment plants, which are almost completely privatized, nor the electric nor the telecoms system, which are private.

the state, revenue paid by the franchise holder to the state for preexisting infrastructure, risk assumed by the bidder during the construction and/or operation stages, quality of the technical offer, fraction of revenue (beyond a certain threshold) shared with the state (or users), and total income from the concession. More recently, the law was reformed and the priority was given to total income from the concession. The recent auctions which have not required subsidies have all been auctioned using this variable (see Table 5).

The usual procedure to finance a highway franchise in Chile involves several stages:

- Bidders must offer call bonds (*bonos de garantía*) that can be called in by the government if the bidder cannot finance the project. Moreover, similar bonds are callable if construction targets are not achieved by predetermined dates or quality maintenance standards are not met.
- Banks lend money for construction of the road. The law stipulates that banks are the only financial institutions that may lend to finance construction.
- After the road is built, the franchise owner can issue bonds backed by toll revenues (securitization). These coupon bonds are usually bought by private pension funds and insurance companies.
- The law stipulates that the franchise owner cannot securitize more than 70% of the debt in order to induce good behavior in the maintenance and operational phase of the franchise.

The law states that the concessionaire must build the project within the time limits established in the contract, providing an uninterrupted service of a quality consistent with the terms of the bid. The Ministry of Public Works (MOP by its Spanish acronym) supervises the construction and operation of the project, and is allowed to fine, suspend or even terminate the concession should the franchise holder fail to meet his obligations. The law also establishes a dispute resolution mechanism to review conflicts between the state and franchise holders.

Highway concessions 26 highways were concessioned between 1993 and 2007 (Table 3), involving investments of about US\$11 billion and which already operative. In addition, 8 additional highway projects are under construction and more recently, three additional projects have been adjudicated.⁸

Projects can be classified into three groups:

⁸Under construction: 1. R5, Puerto Montt-Pargua. 2. R5, Vallenar-Caldera. 3. R160, Coronel-Tres Pinos. 4. C.V. Melipilla-C. de la Fruta. 5. R66, C. de la Fruta. 6. C. Internacional R60. 7. Autopistas R. Antofagasta. 8. Acceso AMB. Recently adjudicated: 1. R5 Serena Vallenar. 2. Acceso Iquique. 3. Acceso Concepción por Cabrero.

- The Pan-American Highway (Ruta 5), which runs from La Serena in the North to Puerto Montt in the South, which was divided into 8 double lane segments and extends over approximately 1,500 kilometers.
- 13 interurban highways. They include some that join Santiago with nearby cities (Los Andes, San Antonio, Valparaíso), and a number of local roads (e.g., Camino de la Madera, Nogales-Puchuncaví, Acceso Norte a Concepción);
- Five urban highways in Santiago

The program was launched in 1993 with the 23-year long El Melón tunnel franchise. The auction mechanism used was unnecessarily complex (see Box 3.1), but this can be forgiven as the initial test of a new system.

BOX 3.1 (El Melón Franchise) *The Chilean concessions program was launched in 1993 with the 23-year long El Melón tunnel franchise. The auction mechanism used was complex. Firms bid on a weighted average of seven variables: annual subsidy by or payment to the state, toll level and structure (composed by six different tolls, with different weights for different classes of vehicles), term of the franchise, minimum income guarantee, degree of construction risk borne by the franchise holder, score on the basis of additional services and CPI adjustment formula. While only two of these variables (toll rate structure and payment to the state) were given weights that would have an effect on the final outcome, the result of the tender was unexpected. Four firms presented bids for the franchise and they all demanded the maximum toll and franchise term allowed by the auction. The selection was decided solely based upon the annual payment to the state. This outcome was inefficient, since a lower toll and a smaller annual payment to the state would have been better. Apparently, the weights on the toll rate variable were set incorrectly. Another surprise was that the winner outbid the second-highest bid by almost a factor of three. ■*

Subsequently MOP experimented with other tendering mechanisms. For example, the Acceso Norte to Concepción, the Nogales-Puchuncaví Road, and the Santiago-San Antonio (Ruta 78) highways were awarded to the firm bidding the lowest toll. By contrast, most segments of the Pan American highway were auctioned using a mechanism that made firms compete first on tolls and then, when a lower bound was reached, on either the shortest franchise term or a yearly payment to the state (which was described as a “payment for pre-existing infrastructure”) since the government wanted similar tolls per kilometer in all of the Pan-American highway. Moreover, some segments, which were thought to be privately unprofitable, were awarded subsidies, which were supposed to be similar to the amounts

collected as payments for existing infrastructure. The highway that joins Santiago with Valparaíso and Viña del Mar in the coast was the first that awarded with a PVR auction (during 2008, several additional projects were awarded using a PVR auction). Most tenders were reasonably competitive, because with few exceptions, the number of bidders was between three and six.

Route 68, which joins Valparaíso with Santiago, was franchised using a flexible term PVR auction (see Box 3.2).

BOX 3.2 (First PVR Auction) *The Route 68 concession, joining Santiago with Valparaíso and Viña del Mar, was auctioned in February of 1998. It was the first Chilean road franchised with a PVR auction.⁹ Under this scheme, the regulator fixes user fees and announces a discount rate, and the franchise is awarded to the firm that bids the least present value of toll revenue.¹⁰ The franchise ends when the present value of toll revenue is equal to the winning bid. By letting the franchise length depend on demand realizations, PVR auctions reduce risk borne by the franchise holder substantially.¹¹ This should lower the demand for traffic guarantees. The Route 68 concession contemplated major improvements and extensions of the 130 kilometer highway and the construction of three new tunnels. Five firms presented bids, one of which was disqualified on technical grounds. For the first time in the Chilean concessions program, minimum traffic guarantees were optional and at a cost. That the pricing of guarantees by the government was not way off the mark can be inferred from the fact that two of the bidders chose to buy a guarantee, while the winner declined. Bidders could choose between two rates to discount their annual incomes: either a fixed (real) rate of 6.5% or a variable (real) rate given by the average rate of the Chilean financial system for operations between 90 and 365 days. A 4% risk premium was added to both discount rates. Three firms, including the winner, chose the option with a fixed discount rate. Somewhat surprisingly, the present value of revenue demanded by the winner turned out to be below construction and maintenance costs estimated by MOP.*

It is also interesting to mention that the main reason why MOP decided to use the PVR mechanism is that it facilitates defining a fair compensation should the ministry decide to terminate the franchise early. This feature of PVR is relevant in this case since MOP estimates that at some moment before the franchise ends, demand will have increased sufficiently to justify the development of an alternative highway (La Dormida) that competes with Route 68. Thus, the contract of the Route 68 concession allows MOP to buy back the franchise at any

⁹In a series of papers, beginning with Engel et al. [1996], we have highlighted the advantages of this approach and formally derived many of its properties, including scenarios where it is the best possible auction mechanism (see Engel et al. [2001]).

¹⁰The discount rate should be a good estimate of the costs of funds faced by franchise holders and could be variable (such as LIBOR plus some fixed risk premium).

¹¹Associated welfare gains can be considerable. Engel et al. [2001] show that with parameters typical for developing countries, welfare gains are of the order of 30% of the investment in the highway.

moment after the twelfth year of the franchise, compensating the franchise holder with the difference between the winning bid and the revenue already cashed, minus a simple estimate of savings in maintenance and operational costs due to early termination. No such simple compensation is available if the franchise term is fixed.

The particulars of concession contracts vary, but they also share common features. Fifteen out of the 26 highway concessions have been awarded with subsidies and all of them—except for Route 68—received minimum income guarantees. Thus, direct and contingent subsidies are almost a given when it comes to highways. At the same time, 22 highway contracts include revenue sharing between the state and the concessionaire.

One of the main virtues of the Chilean concessions program is that legislation has been effective at dispelling fears of expropriation. An important part of the credit rests with the reforms implemented in Chile since the mid-seventies which considerably strengthened property rights. Perhaps the most evident indicator that there is little fear of expropriation is that concessionaires have been quite happy with the “build now, regulate later” approach followed by MOP—so far there is no independent regulator of concessions, an idea that the industry has vigorously opposed. Nevertheless, there is a legislative proposal in Congress that sets up a supervisory agency, though it has not been approved.

Another merit of the Concessions Law is that it specifies that all concessions must be awarded in competitive auctions, open to foreign firms. This proviso limits the scope for regulatory capture and outright corruption.

One of the main shortcomings of the Chilean concessions program, however, is the lack of an external regulatory framework. MOP has been in charge of designing, implementing, supervising and renegotiating contracts. Each project has been designed independently and its rules are defined by the specific contract. The tension between the pressures for the success of a concessions program measured in terms of construction and the enforcement of contracts is evident. MOP, as most sectoral ministries under similar circumstances, has opted for development over regulation. Moreover, because MOP renegotiates the contracts it has awarded, it has incentives and the opportunity of covering up its mistakes. (For an example, see Box 3.3 which describes the case of Tribasa.)

BOX 3.3 (MOP as contract supervisor) *Tribasa, a large infrastructure company, had been an important participant in the first stage in Mexico’s franchise program. At the time, it was saved from bankruptcy by the Mexican government. Notwithstanding that experience, it became an important and aggressive participant in the initial stages of Chile’s infrastructure program and was awarded three major franchises: Acceso Norte a Concepción, Chillán-Collipulli and Santiago-Los Vilos (which had complementary contracts worth almost 50% of the original project).*

After completing the Acceso Norte a Concepción it ran into liquidity problems and sold Chillán-Collipulli in July 1999. In the year 2000, Tribasa was late in completing the Santiago-Los Vilos section of the Pan American highway. For several months, MOP was willing to allow the delays to accumulate without collecting the guarantees Tribasa had posted. Eventually, public pressure forced MOP to acknowledge there was a breach of contract. The franchise was transferred from Tribasa to another concessionaire without a formal auction procedure.

There is also evidence that MOP has been lax in enforcing concession contracts. For example, a report issued by the National Comptroller (*Contraloría General de la República*) of 2002 concluded that the ministry relied solely on traffic data provided by franchise owners, having neglected to set up independent procedures to collect this information.¹² This is worrisome, since government guarantees are triggered by low traffic flows, so that firms have incentives to underreport traffic.¹³

Finally, MOP has probably auctioned projects with low social returns. Chile has had a social evaluation program of government financed projects for more than three decades. This procedure, which is performed by the Ministry of Planning, ranks projects according to their social return and screens projects with low returns. On occasion, MOP seems to have subverted this procedure, by removing the least cost-effective parts of the projects submitted to the Planning Ministry. The omitted components were reincorporated after the approval and adjudication of the project, via so-called *complementary contracts* with the franchise holder, which are negotiated in private.¹⁴ With regard to traffic guarantees, the Finance Ministry had to develop a methodology to evaluate the expected cost of the guarantees. Finally, In those cases in which subsidies have been provided, the social project evaluations that justify the subsidies have not been made public either.

It has been fortunate that MOP's objective of attracting bidders conflicted with those of the Ministry of Finance, which is responsible for the budgetary process. This has forced a more independent evaluation of the toll road program. Indeed, press reports suggest that on more than one occasion the Ministry of Finance successfully stopped MOP from offering particularly generous government guarantees to franchise holders. More generally, however, MOP can transfer rents to franchise owners via favorable regulations.

Renegotiation of concession contracts During the early years of the franchise program, the government avoided renegotiations even in those cases in which they would have increased welfare, as in the case of the El Melón Tunnel, perhaps to build a reputation for

¹²"Contraloría critica sistema de control de concesiones", *La Tercera*, April 22, 2003.

¹³Moreover, in the case of Route 68, the concession length is inversely related to traffic flows.

¹⁴See "Informe de la U. de Chile revela suerte de embaucamiento del MOP a Mideplan," *La Segunda*, May 13, 2003.

Table 4: Renegotiations and total investment in PPPs in Chile (UF)

	Budgeted investment (Technical offer)	Bilateral renegotiation	Conciliations and arbitration	Total renegotiated	Total investment	Renegotiation as fraction of budgeted	Renegotiation as fraction of investment
Ruta 5	71.885.711	15.866.047	4.678.409	20.544.456	92.430.167	0,29	0,22
Interurban roads	52.951.424	6.972.069	3.481.338	10.453.407	63.404.831	0,2	0,16
Autopistas urbanas	60.613.607	33.288.928	0	33.288.928	93.902.535	0,55	0,35
Highways	185.450.742	56.127.044	8.159.747	64.286.791	249.737.533	0,35	0,26
Airports	8.798.114	1.139.836	62.212	1.202.048	10.000.162	0,14	0,12
Jails	7.414.824	0	2.661.785	2.661.785	10.076.609	0,36	0,26
Reservoirs	4.131.579	197.212	215.882	413.094	4.544.673	0,1	0,09
Transantiago	4.884.764	0	645.599	645.599	5.530.363	0,13	0,12
Public Infrastructure	4.243.082	24.153	0	24.153	4.267.235	0,01	0,01
Other concessions	29.472.363	1.361.201	3.585.478	4.946.679	34.419.042	0,17	0,14
Total or average	214.923.105	57.488.245	11.745.225	69.233.470	284.156.575	0,32	0,24

Source: EFGH 2008.

Note: Currently, 1UF=US\$ 40.

not renegotiating (see Box 3.4). But this good intentions did not last and in 2001 conditions changed. Substantial amounts were renegotiated in 2001, 2003, 2005 and 2007. As of the end of 2007, the 50 concessions that MOP awarded between 1993 and 2007 had been renegotiated 144 times, averaging 2.9 per concession. Highways tend to be renegotiated more. The 26 concessions have been renegotiated 109 times, 4.2 per concession. Most renegotiations have led either to increase the payments received by the concessionaire for the original project or to upgrades to the original project.

Renegotiations can be either bilateral or under the supervision of a commission set up to adjudicate disputes. In a bilateral renegotiation MOP and the concessionaire reach an agreement which is not revised by an independent third party. If, on the other hand, the parties fail to agree, they can appeal to a commission which first tries to conciliate and then arbitrates. A little above half of all renegotiations (74 out of 144) have been bilateral. Nevertheless, as can be deduced from Table 4, about 83% of the additional amounts conceded to concessionaires have been granted after a bilateral renegotiation, hence without external scrutiny (see Box 3.4 for an example). Almost all bilateral renegotiations have been initiated by MOP and occurred before the project was completed. By contrast, most renegotiations with a commission have adjudicated conflicts that have occurred after the project was completed.

BOX 3.4 (Renegotiation without supervision by third parties) *After signing the concession contract for Route 78, MOP required additional works that were not included in the original contract. The franchise holder asked for a compensation for the additional construction and the ministry decided to increase tolls by 18.1% during a five year period. No further explanation was given (the public learned of the agreement only after it was signed), and the*

*calculations that led to the compensation were not made public.*¹⁵

The amounts renegotiated are substantial. As can be deduced from Table 14, of the US\$11.3 billion invested in 50 concessions, US\$ 2.7 billion was added after a renegotiation. Of these, at least US\$ 1.4 billion were additional works. In other words, about one in every four dollars invested has been added after the contract was awarded. Alternatively, the total amount invested has been increased by about one-third after the contract has been awarded.

There are several means to increase the concessionaire's revenues or compensate him for additional works, among them direct payments from the government, tariff increases and term extensions. Nevertheless, the most used form of compensation is a direct payment from the government—almost 70% of the total amount renegotiated. This does not mean an immediate impact on the public budget, however. Indeed, two thirds of these direct payments will be paid by future administrations.

4 Corruption in MOP

In 2002 a case of corruption came to light in the PPP unit of MOP. Given the number of projects awarded in the late 90's, there was a strong demand for personnel with experience in PPPs, and the PPP unit started to lose personnel. Given the inflexibility of the Chilean government salaries, it was difficult to raise salaries legally. The PPP started contracting with diverse institutions (universities, for instance), including paper firms, to provide nonexistent services. In turn, these firms and institutions would contract employees in the PPP unit without asking for any work, thus raising their effective remunerations. By this means the unit was able to retain personnel in a moment of high demand for their services in the private sector. However, these and other expenses related to the expansion of the concessions program, plus the costs associated to the commitments acquired in renegotiations, committed the budget of the MOP for several years. Because it was unable to obtain further funds from the Finance Minister, the Public Works minister started negotiating with the PPP providers so that they would contract the paper firms to provide the nonexistent services and pay the employees of the PPP unit. The concessionaires were compensated by being allowed to overcharge in their contract renegotiations.¹⁶

This was an extremely dangerous practice, because there would be no independent checks on the private firms or MOP. When the judges investigating a related corruption case discovered these payouts, then President Lagos came very close to having to resign,

¹⁵See "Estado compensará a privados por concesión", *El Mercurio*, July 15, 1997, page C8.

¹⁶There were also insistent rumors that the private firms involved in PPP were prime donors to the government's political campaigns.

specially because he had been the previous Minister of Public Works. Under his aegis the program had expanded tremendously -which had helped him get elected- and then current Minister of Public Works Carlos Cruz was his instrument. The President managed to extricate himself by agreeing to a total reform of public sector hiring practices, but Minister Carlos Cruz was sacrificed and after years of trial, has been condemned to several years in prison.

The scandal set back the concessions program for various reasons. First, all the higher echelons of the PPP unit were under investigation and had to resign. There were several new Ministers of Public Works, who went into damage containment mode and had no time for reforms or new projects. Moreover, Carlos Cruz had committed all the resources of the MOP for several years so there were no free resources to use in new studies. As a further complication, there was a huge conflict between MOP and the concessionaires of the prisons, and another one with the private partners in the new Justice center. The prison designs were altered by the Justice Department (apparently without the knowledge of the PWA) so that costs jumped and MOP and the concessionaires had problems valuing the changes that are still not totally resolved.

When, after several Ministers, Eduardo Bitrán become the new head of MOP, he decided to reform the legislation so as to give more control to the MOP over the projects and to reduce the extent of renegotiations of contracts. During his period several new projects were studied. He also tried to reform the internal workings of MOP, and eventually this led to his dismissal. But he managed to have his reforms to the Concessions Law approved eventually at the beginning of 2010, though in a diluted form. We are now experiencing a new start to the Concessions program, under the new rules. These seemed to be working well and have not deterred enthusiasm of participants in bidding for projects. In fact, close to two billion dollars have been committed to PPP investment in infrastructure (mainly transport) since 2008, either already under construction or recently adjudicated, and several billions more will be adjudicated in the next two years.

5 Lessons from Chile

The Chilean case, which has had a successful highway PPP program, plus the experience of other countries in which the results have been less fortunate, can lead to useful lessons for a country like Rwanda, which is interested in initiating its own PPP program. The author is aware that there is a difference in the GDP per capita and that the number of skilled and trained cadres is smaller in Rwanda, so the recommendations consider these characteristics, as far as possible.

A first issue is to distinguish between two types of PPPs: those that generate sufficient

Table 5: PVR highway concessions in Chile and winning bids

Name of Project	Month/year auctioned	Winning bid (MMUS\$)
Ruta 68 (Santiago-Valparaíso-Viña del Mar)	02/1998	513
Ruta 160, Tramo Coronel - Tres Pinos	04/2008	342
Acceso Vial Aeropuerto Arturo Merino Benítez	07/2008	56
Conexión Vial Melipilla-Camino de la Fruta	08/2008	46
Ruta 5 Vallenar-Caldera	11/2008	288
Autopista Concepción-Cabrero	01/2011	318
Alternativas de acceso a Iquique	01/2011	167

Source: Dirección de Concesiones, MOP. Exchange rate: 1UF=US\$43

revenues to pay for themselves, and those that do not, and therefore require subsidies. There are some issues that that appear in the first case that are irrelevant in the case of projects needing subsidies, and the difference will be stressed in hat follows.

In Chile, most of the initial highway PPPs did not require explicit subsidies, as they were obvious cases with high demand in a country that was getting wealthier relatively quickly. After these earlier PPPs became operational, the Public Works Authority (MOP or PWA in what follows) started examining additional projects that might require subsidies in addition to user fees. In addition there were other projects in which user fees were never a consideration: jails is the clearest example. Those projects face a different set of problems from those of projects financed with user fees.

5.1 Political economy

The first issue with regards to any PPP program is to understand the political economy implications and be prepared to face them. Otherwise, it is easy to run into serious problems. In that respect, the early Mexican PPP program represents a salutary experience. Mexico privatized highways in the early nineties, without establishing good institutional arrangements for dealing with PPPs. In the ensuing disaster Mexican taxpayers had to pay more than US\$8 billion after renegotiation of the initial contracts, and the projects were not successful.

5.1.1 There is no free lunch

One of the first problems that confronts the government when initiating a PPP program is that resources that had seemed constrained in the past are no longer a problem. Firms are now willing to provide funding for infrastructure projects that were not available be-

fore. However, it is easy to see that these new resources are just a deployment of existing resources and not represent real new resources.

Consider first the example of a PPP project that is completely financed with user fees. The revenue under the contract pays for the initial investment, the operations and maintenance. But the government could have contracted a firm to build the road and contracted another firm for operations and maintenance, paying both with the user fees. Of course, one could argue that due to political considerations, the government was unwilling or unable to set user fees at the appropriate level and that by transferring the project to private management that can be solved. However, there are many examples that show this is not the case. In Chile, for instance, truckers managed to get a reduction in their tolls and the lost revenue had to be made up from government resources. Similarly, in the Indiana Toll Road, the State of Indiana refused to raise tolls under the terms of the PPP contract and compensated the private party from State resources.

Similarly, if the project is financed solely by periodic government payments (the so-called *availability payments*), as in the UK Private Finance Initiative, the resources must be accounted for intertemporally. There is no difference in this case with the government asking for a loan to build, operate and maintain the project. For more details see Engel et al. [2007].

Clearly then, again there are no additional resources from PPPs. Intermediate cases, which combine user fees and availability payments also have the same problem. The apparent freeing of normal financial constraints can lead to overspending and misallocation of resources, as in the case of Mexico.

Box 5.1 explains the exception: a case where PPPs do allow for increasing resources to a debt-constrained economy.

BOX 5.1 (A Role for Multilaterals?) *Consider a poor cash-constrained country, which desires to build a revenue generating infrastructure project. If it tries to obtain a loan to build the project, using the fact that it can repay the loan with the revenues generated by the project, commercial lenders will refuse, because the revenues of a cash generating project can be appropriated to other purposes rather than repaying. As it is almost impossible to provide guarantees preventing this possibility, a PPP organized as a SPV (Single Purpose Vehicle) is the appropriate mechanism to protect the private investors in the project. However, the flow of cash derived from the sunk investment of profitable projects is an attractive target for expropriation by credit constrained governments.*

To reduce this possibility, these projects are often “protected” by receiving partial funding from multilateral banks. Multilateral banks “protect” the project from being ex-

propriated by the clauses associated to their lending. It is important to note that the loans and equity participation of Multilateral Banks are privileged [Buiter and Fries, 2002]. First, because of the repeated interactions between borrowing countries and multilaterals, which promise future lending only if the terms of current loans are in compliance. Though there are exceptions to this policy, see Buiter and Fries [2002]. Second, because the claims of multilaterals have priority over the international reserves of the country and these claims are senior to those of bilateral and commercial creditors in case of financial distress. Third, the multilateral banks are active in protecting their equity investments in national and international courts of law, and the reputation for this policy increases the cost of noncompliance. This explains the value of the participation of the private investment arm of the multilateral banks in PPP projects in developing countries. By their normally careful lending procedures, multilateral banks can also promote funding by providing information about the quality of the projects in which they invest. We further explore the use of multilaterals to help provide PPP investment in a borrowing constrained country in section 6. We explore this issue in section 6.

5.1.2 Organizational problems

Even when the government recognizes that there are costs to a PPP program and that the associated resources are not free, the expansion of the Public Works program usually associated to PPPs can lead to various organizational problems, including corruption. First, the increased demand for experienced manpower can lead to defections from the bureaucracy just when the requirement is greatest for trained personnel. In turn, this can lead the PWA to design ingenious means to increase the remunerations of employees, as occurred in Chile with disastrous effects. Second, the pressures to expedite projects when resources are finally available may lead to breaching rules and constraints on the system that protect the public. Third, in trying to keep the private investors happy, the Public Works ministry may sacrifice rules and regulations. In turn, the firms may offer extremely good terms in the expectation of changing the conditions after adjudication of the contract.

In this, there is no difference between what occurs in normal public works contracts and under PPPs. What is unusual however, is the extent of resources that can be tapped under a PPP program, and it is this abundance that causes the characteristic problems associated to PPP programs in their initial stages.

5.1.3 Foreign pressure

One of the problems associated to PPP programs is that usually the firms involved have global scope and can count on lobbying their home countries for support in any disputes. This may make it more difficult to maintain the contract conditions in the face of difficulties and obstacles.

It must be remembered that not all PPP projects are profitable to the private sponsors and that some make losses, which is the counterpart of other projects being very profitable. The higher the risk facing a project, the higher the expected return.

5.1.4 Contract renegotiation

Closely linked to the previous issues is the problem of contract renegotiation. It is reasonable to assume that over time, long run contracts have to be renegotiated in the face of changing conditions. However, the contractual changes should not make the project more profitable for the firm (in the sense of not receiving rents, not that it does not make a normal return on capital adjusted for risk). Otherwise the initial competition for the PPP contract becomes a sham.¹⁷ Thus, even though renegotiations can be appropriate in certain circumstances, they can also generate serious problems when used indiscriminately.

First, because in contrast to the situation in the bidding stage for the contract, in which firms compete, there is now a situation of bilateral monopoly. Under these conditions, the private party can improve over its original situation, obtaining rents (this is why construction companies always like to renegotiate contracts and add improvements to a project). Second, given that the negotiation is not public and there are large amounts at stake, corruption is a possibility or can be suspected by the public (even when it does not exist). Third, renegotiation of contracts can cover oversights by the Public Works Agency, so it encourages a tendency to plan indulgently and not prepare projects carefully. Fourth, it can be a way of escaping budgetary control, since additional works that are included in a renegotiation process are usually not included in the budget, and their compensation may be loaded towards payments by future governments. This excess spending by renegotiation is exemplified by Minister Carlos Cruz in Chile. For these same reasons, renegotiations of contracts can be used to compensate a firm for financial support in a political campaign. Finally, a country that is known to renegotiate contracts tends to attract firms that are good at this task, at the expense of other more technical abilities.

Hence contract renegotiation is a serious problem for PPPs, and due to its special characteristics, is more serious with PPPs than under traditional infrastructure provision. The explanation is that an agreement between the private party and the PWA does not have to

¹⁷Guasch's "sanctity of the bid." Guasch [2004, p. 37]

be paid at the moment, but the compensation can be delayed into the future. This is not possible under traditional infrastructure provision, in which the firm doing the construction of the facility needs to be paid without delays. An example is the case of the PPP for the Chicago Skyway, in which the toll increases were loaded towards the future, so that the lease agreement did not become too unpopular.

5.1.5 Good maintenance

Perhaps the biggest advantage to poor country of a PPP is the possibility of timely maintenance. For diverse political economy reasons, routine maintenance is not carried out in underdeveloped countries with any consistency. This implies that roads deteriorate and are often in bad shape, increasing transport costs. Moreover, the eventual repairs are much more expensive than with timely and routine maintenance. PPPs have the advantage of ensuring maintenance, considering that the firm is exposed, having invested a large amount in the project that will only be recovered close to the end of the project. See Figure 1.

5.1.6 End of contract

A problem occurs at the end of the contract, as the private party no longer has an interest in the proper maintenance of the road. In order to provide the correct incentives, the government should require that the private party post bonds that will be cashed if the road requires repairs, and that will help pay for them. One advantage is that the bank that supplies the bonds will pressure the private party into taking good care of the road until the end of the contract.

5.1.7 Insurance

In case of natural catastrophe that causes serious damage to the infrastructure facility, it is convenient to require the private party to always have enough insurance to cover the necessary repairs. Otherwise, the road may remain in disrepair while the PPP, unable to get funds (because it is overstretched and the project is now unprofitable—an example of debt overhang—) but does not want to lose the contract and make a total loss.

Even then, it might be convenient to include a clause that totally or partially stops payments on the services of the infrastructure when it is impaired by a natural disaster. This serves two purposes: in the case in which user fees are an important component of the firm's remuneration, it provides a *quid pro quo* balance between benefits from the roads and the obligation to pay by users that legitimizes the system. Second, the firm will have to add insurance for loss profits due to the catastrophe, and the insurance company will pressure the firm into repairing the infrastructure facility as quickly as possible. Chilean

experience after the 1988 earthquake shows is difficult for the PWA to pressure firms so that they fix the problems quickly, possibly because of the mixed objectives of the PWA, see section 5.2.5.

5.2 Prerequisites for success in PPP provision

This section includes diverse recommendations that should help avoid some of the problem that have plagued PPP programs in many countries, including those in Chile.

5.2.1 Clear rules

It is better to have specific legislation to deal with PPP contracts, which involve a firm and the government in long lasting contracts. This reduces the setup costs of contracts and creates a framework for dealing with conflicts rather than dealing with them in a case-by-case basis. By reducing the risk and the space for discretion or for judicial conflicts, a good legal framework reduces the risks facing market participants and therefore the return they require on their investments. Just as an example, the first Chilean legislation allowing PPPs was introduced in 1991. This framework was only used in one PPP case, after which it was reformed and improved in 1996, just before the big expansion in the PPP program that totally changed infrastructure in Chile. That legal framework showed itself to be to excessively favorable to the private parties in the case of the prison PPPs. It also led to an excessive expansion of the system and had to be reformed in 2010. Under the new legal regime, the PPP program has regained strength. In particular, legal rules should define an efficient and equitable conflict resolution mechanism.

5.2.2 Cost benefit analysis

When a project generates sufficient user fee revenue to pay for itself, the need for cost-benefit analysis is reduced, because, unless it produces large negative externalities, private profitability implies social profitability and therefore there is a market test of the project. However, in most cases the projects require subsidies (direct availability payments, through demand guarantees, etc) and in this case the previous comment does not apply. The resources used to subsidize the project are scarce and have alternative uses so the investment in the project must be shown to be at least sufficiently good, i.e., it should pass a hurdle rate of social cost-benefit profitability. This means that in general projects should be subjected to cost-benefit analysis. A further advantage of a systematic procedure of cost-benefit analysis is that it protects the government, and in particular the economic authorities and the public works authority, from political pressures.

5.2.3 Projects in final form

There is a common tendency, observed in Mexico, Colombia (first generation projects) and other countries, including Chile, for projects designs not to be in their final stage before the project is awarded as a PPP. In Mexico, some projects did not have any details before they were franchised.

One reason for this is the pressure to build that is inherent in Public Works Authorities, coupled to lack of resources for project development. In general there are several stages in the development of a project, with each design having increasing detail and smaller cost uncertainty, but these stages are expensive and take time. Nevertheless these are resources that are well spent since they can avoid the problems of the Mexican or Colombian programs. The cost to government of renegotiations of incomplete projects can be huge. There are various mechanisms to reduce the design cost or to tack them onto the successful bidder of the project, and these should be used intelligently, but projects should be in final design form before being franchised.

5.2.4 Transparency

The procedures for awarding the project should be transparent and open to the public for inspection. This means putting all information on the project and regarding the contract on the internet (of course this does not necessarily include the detailed engineering plans, at least before the auction for the project). Transparency of this sort attracts participants because they have more trust that the rules are not discretionary. In addition, after the contract is signed, the winning offer, as well as the losing offers should be made public.¹⁸ Even more importantly, any changes in the contracts or renegotiations of the contracts should also be publicly available, preferably on the internet. By being available for the public to examine, they put pressure on government negotiators not to be too accommodating to private firms and this improves their bargaining position. In addition, losing participants can be sure that the initial winning offer was not a stratagem that was later compensated by contract renegotiations that favor the firm. This makes it more attractive to participate in projects, by knowing that other firms are not at a disadvantage.

5.2.5 Independent supervision and conflict resolution mechanisms

The Public Works Authority (Ministry of Public Works) is usually committed to the development of new projects and therefore wants to attract as much investment as possible into the sector. This means that supervision and regulation is not a first priority and when

¹⁸The slight danger of this being used for collusion of participant firms can be reduced by trying to attract new firms for new projects.

conflicts occur, the PWA is willing to sacrifice the interests of the public in order not to antagonize the firms in the PPP sector.

Because of this conflict of interests, it is best to separate the functions of supervision and conflict resolution from the PWA. If resources exist, and independent supervisory agency that takes care of supervision of all public work contracts and projects can lead to better outcomes than the combined objectives of a single entity.

In addition, there will be frequent conflicts between the PWA and the private sponsor of the PPP. The judiciary is too slow and too inexperienced to solve these conflicts satisfactorily. For this reason it is useful to have an specialized, independent Panel that evaluates and decides on these conflicts (with the possibility of appeal to its decisions). By having experienced members, speed of resolution and a track record, this type of mechanism contributes to confidence on the PPP system and therefore promotes interest on and reduces the return required by participants in PPP projects.

5.2.6 Unsolicited proposals

Once there is a mechanism for PPPs, unsolicited proposals will arrive and there should be a mechanism for dealing with them, because in some cases the proposals are innovative and should be encouraged. This requires the development of mechanisms for compensating the private parties for their ideas without affecting the transparency and efficiency of PPP awards (see Hodges and Dellacha [2007]) for an examination of alternatives. In some countries (Chile, for instance) the proponent has an advantage in the competitive auction for the project (or the proponent can transfer its option). Its bid is chosen if it is no more than say, 5% or 10% off the best bid. In other countries, the proponent can match the best offer. The problems with these approaches is that the advantage possessed by the proponent may detract from participation in the auction, and therefore lead to projects awarded with little competition.

We have proposed a mechanism that separates the proposal stage from the award stage.¹⁹ Each year only a small number of proposals are chosen by the PWA, rewarding the selected proponents with a fixed prize that is sufficiently appealing to attract good projects. The prize is paid by the PWA, but it is reimbursed by the winner of the project once it is awarded under standard competitive conditions. This proposal combines incentives for good unsolicited proposals while not altering the competitiveness and transparency of the award process.

¹⁹E. Engel, A. Galetovic and myself.

5.2.7 Only one principal

At times PPPs will be developed for other Ministries and not for the Public Works Authority, but the PWA might still have overall control due to its experience with PPPs. In that case the *split authority problem* may arise. This occurs when the private party has two principals with different objectives and probably little communication. This occurred in Chile with the prison PPPs. The Justice Ministry would order modifications to the initial design and the PPP would overcharge for them, leading to conflicts with the PWA and enormous expenses and delays. In fact, some jails have still not been finished, almost five years after their expected completion date, and they have been enormously expensive for government. The reformed PPP Law solved that issue by explicitly declaring that in all PPP projects, all modifications that were not approved by the PWA were made under the exclusive responsibility of the private party and the State was not liable for them.

5.2.8 Qualification

There should be several stages in a PPP process, after the design is finalized. First a road show to potential participants. Then a qualification stage in which objective measures are used to disqualify firms that are clearly incapable of the task. In a third round, firms should compete with a technical proposal to address the project and to show the ability to attract finance for the project. At this stage the participants should post bonds that provide evidence of financial support. An unfortunate situation occurred in several early PPPs in Colombia, where the winning firms were unable to obtain finance for their projects.

5.2.9 Economic bids

After the qualification process the remaining firms should compete on the basis of a simple and meaningful economic variable. See figure 3 for the winning bid for the Coronel-Tres Pinos Route 160 PPP. The winning PVR bid (see 5.2.11) asked for a present value of user fee revenue equivalent to approximately US\$341 MM auctioned in 2008. Note that in figure 3, the PWA has set a limit on the PVR value (of US\$473MM) after which the competition switches to asking for the minimum subsidy.²⁰

5.2.10 User pay

Having users pay has several political economy advantages. First, when the project is financed solely out of user fees, those who benefit from the project pay for it, a case in which the usual distributional or regional lobbying pressures to invest in particular infrastructure

²⁰I believe this last to be a mistake and propose an alternative in section 5.2.11.

CONCESION RUTA 160, TRAMO TRES PINOS
- ACCESO NORTE A CORONEL

ANEXO Nº 1: FORMULARIO DE OFERTA ECONOMICA

IDENTIFICACION DEL LICITANTE O GRUPO LICITANTE:

ACCIONA CONCESIONES RUTA 160

Acepta el Mecanismo de Ingresos Mínimos Garantizados, según lo indicado en el artículo 1.12.7.1 de las Bases de Licitación.

Si

(Indicar SI o NO)

TRAMO AL QUE POSTULA: (Completar CON A o B según el Tramo al que Postula)

TRAMO: A

FACTOR DE LICITACION (Completar):

TRAMO	Valor de ITC.	Valor de S.
A	<u>7.950.000.-</u> U.F.	0 U.F. (cero Unidades de Fomento)
B	11.000.000 U.F. (once millones de Unidades de Fomento)	_____ U.F.

Notas:

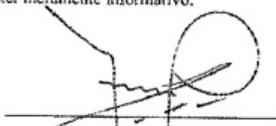
1) ITC: Corresponde al monto de los Ingresos Totales de la Concesión que el Licitante o Grupo Licitante postule obtener de la Concesión, calculado en valor presente, en U.F., sin decimales. El monto a solicitar por el Licitante o Grupo Licitante no podrá ser mayor que U.F. 11.000.000 (once millones de Unidades de Fomento).

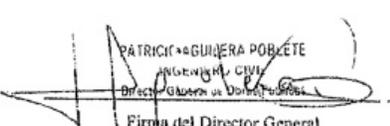
2) S: Corresponde a la cuota de Subsidio a la construcción de las Obras que el Licitante o Grupo Licitante postule obtener de la Concesión, en U.F., sin decimales. El monto a solicitar por el Licitante o Grupo Licitante no podrá ser mayor que U.F. 518.000 (quinientas dieciocho mil Unidades de Fomento).

Para efectos de la valorización de los ingresos para el cálculo del VPIm, según lo indicado en el artículo 1.7.7.1 de las Bases de Licitación, el Licitante o Grupo Licitante debe indicar que tipo de Tasa de Descuento utilizará para estos efectos (Marcar con una cruz (X) donde corresponda):

Tasa Fija	<input checked="" type="checkbox"/>	Tasa Variable	<input type="checkbox"/>
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Declaramos que la presente Oferta ha sido formulada teniendo en cuenta exclusivamente nuestras propias estimaciones, y que los antecedentes y datos proporcionados por el Ministerio de Obras Públicas tienen un carácter meramente informativo.


Firma Representante ante el MOP (*)


PATRICIA GUAJERA POBLETE

Directora General
de Obras Públicas

(*) Representante Designado de Acuerdo al artículo 1.5.5 letra A) Documento Nº 3 de las Bases de Licitación.

Figure 3: Scan of the winning bid for the Coronel-Tres Pinos R160 PPP. 1UF=US\$43.

projects disappear or are reduced. Second, even when users only pay for a fraction of the total costs there is still some empowerment of the public. This means that the public will act as an additional supervisor of the quality of the project. Finally, it is a test of the quality of a project that users are willing to pay for it.

5.2.11 PVR or similar

We have proposed that in those cases in which user fees are sufficient to pay for the project, in many cases PVR is a adjudication mechanism that leads to better results in PPP projects.²¹ PVR is an auction in which firms compete on the basis of the expected discounted revenue they require from the project. The discount rate is the market discount rate of the period, plus a risk factor reflecting construction cost risks. This procedure is simple and has several benefits. It is used by Chile and Portugal and is under study in other countries. The main advantages of the method are the reduction in demand risk and the fact that it defines a fair compensation in case the concession must be terminated ahead of time.

First, consider demand risk. Since the PPP will eventually accumulate sufficient user fee revenue (otherwise the project was probably a white elephant and therefore PVR works as a test for white elephants), the firm faces no risk of demand. Assuming standard risk coefficients and Chilean data, we have estimated a cost reduction of 30% due to decreased demand risk [Engel et al., 2001].

Second, given a reasonable good estimate of maintenance and operational costs (which are basically linear in use in the case of highways), it is possible to define fair compensation for early termination of the contract as the difference between the value of winning PVR and the net present value of accrued user fee revenue, minus minus the avoided operations and maintenance costs. This is very useful when it is necessary to change the contract because congestion has increased before it was expected, and additional infrastructure is needed. In a new auction, the cost of compensation can be included, so the government faces no short-term budgetary cost It can also be used o terminate a contract which has not worked correctly of for any other reason.

In addition, by their nature, PVR contracts cannot be renegotiated by extension of terms. Thus some of the ways in which the value that is renegotiated is hidden from the public (term extension or higher tolls -whose eventual present value is unknown to the public-, for instance) disappear.

There is one important caveat to the method, which makes it applicable to only some projects: it provides no incentives to increase demand for the project. This is not important

²¹Engel et al. [2001], for example.

for roads, or the landing strip of an airport, or the basic infrastructure of a seaport, but it means that it is not useful for railways, or the operations of a seaport or an airport, for example.²²

We (with E. Engel and A. Galetovic) have also proposed an extension for projects that do not reach financial closure close without subsidies, but the procedure might be complicated to implement. As a second best, but simpler alternative, I propose the following extension of standard PVR: the government offers a defined subsidy (which could be paid over time, as an availability payment) that transforms the project into one to which normal PVR can be applied. This might not be optimal but is a simple extension of PVR that keeps many of its properties, for example its risk reduction and fair compensation aspects, among other advantages. This might be useful in low demand highway projects, for instance.

6 Proposal: Private finance and multilaterals in low income countries

The following proposal is designed for large PPP projects in low income countries which face credit constraints in developing public investment projects. The assumption is that these projects cannot achieve financial closure from user fee revenue and require subsidies. However, the working assumption is that the government does not have enough resources to pay the subsidies, because it is credit constrained. That is to say, even if the project is privately profitable, the government cannot generate enough confidence for lenders (or even PPP firms) to appear). However, the country can access multilateral grants and concessional loans. As a final assumption, there is a lack of qualified human resources in the country.

The idea is to allow the multilateral to use its resources to participate in PPPs. Thus the multilateral agency would be used both for help with financial as well as the human resource constraints. The reason to use PPPs rather than the alternatives is that, as mentioned before, bundling reduces life cycle costs, there are higher on-time and on-completion costs and in the case of roads, better maintenance. Finally, relatively small user fees can be used to empower users to put pressure on the PWA and on the controller of the PPP to maintain service quality.

The government, with the help of the multilateral should prepare a well defined project (that has passed a social cost-benefit hurdle rate) and call for an international competition for the award of the project. The winning firm has to form an SPV to carry out the

²²Moreover, when in use, it should be linked to strong incentives to finish the project under schedule (for instance by forfeiting an increasing percentage of the requested present value for delays), because it does not have the intrinsic incentives for early construction of fixed term contracts.

project, and keep enough equity in the projects to keep incentives aligned. The finance requirements for the remainder of the initial investment are provided by multilaterals and by international private banks, whose loans are guaranteed by the presence of the multilateral with skin in the game.

Once the project become operational, the payment is derived from availability payments (from gov't and from grants), plus revenues from user fees (if any). After it becomes operational, the SPV issues bonds backed by the availability payments and user fee revenues. In order to provide backing and reputation, and to align the incentives of the multilateral with those of buyers of bonds, the multilateral buys a fraction of the bond issue, thus leveraging the resources of the multilateral.²³ Multilateral involvement is also important in the supervision of service quality, where it is a complement to public pressures.²⁴ For this reason user fees should be low enough not to exclude many users, but high enough that users consider it considered a contribution to the project and are therefore empowered.

7 Conclusions

In a comparison with most developing countries and their own PPP experiences, Chile comes out fairly well. However, even in this fairly successful case there were serious problems.

First, the successful concessions were those for highways and seaports (which are governed by a different law and government organization) and next the airports. The other concessions (jails, hospitals, water reservoirs, Justice Centers), have not been particularly successful and in some cases, downright disasters. The experience of the UK and Australia suggest that one advantage of PPPs in complex projects such as schools, prisons and hospitals is that they get completed on time and closer to the budgeted cost.²⁵ There are two caveats to be made to this observation. First, this does not mean that a PPP is better than public provision, because these are not the only elements that should be considered on choosing a PPP. Second, because these results can be reproduced with a fixed cost contract with graduated fines and rewards for late or early delivery of the project, implying that the cost and timeliness advantage of PPPs over public provision is due to ill-designed contracts.

Second, there is the mistaken notion that PPPs release public funds. In most cases, this does not happen and the inter-temporal budget constraint facing the government is as tight as before. The exception is the to be case of credit constrained governments, but

²³I am assuming projects that increase the revenues of the government in the short to medium run, perhaps indirectly, through increased economic activity.

²⁴The previous analysis optimistically assumes an efficient multilateral organization and often, this may not be the case.

²⁵This was also the case of Colombia in its first, failed generation of highway PPPs.

only under certain conditions and still limited by the extent of multilateral support (so the resources are not really “free”). The notion that these funds are free tends to create a wave of investment proposals and a hyperactivity of the PPP sector which is very dangerous. It can lead to over-commitment of future resources (UK), enormous current budgetary costs due to improvised projects (Mexico), early stages of corruption (Chile) and similar problems.

Third, it is important to beware of the perils of renegotiating contracts. Though flexibility is necessary in a long term contract, it should not be used systematically to correct design problems or to add new works without a competitive process. That voids the competitive process used in adjudicating the project, one of the main sources of the advantages of PPPs.

Fourth, the contract should be correctly designed in order to assign risks to the parties that can control them (and also absorb them, see Irwin [2007]). This means that in cases in which there is little control of demand, it is better to assign demand risk to the government rather than to the PPP. This implies that PVR should be used in highways and similar projects. Moreover, when there exists the possibility of repurchasing the project, PVR is a good option because it defines an objective and fair compensation.

PPPs are a fruitful mechanism, but they can be dangerous. In this sense, for complex facilities, governments should also explore the alternative of privatization as a regulated project, while providing means-tested subsidies to demand.

References

- William Buitter and Steven Fries. What should the multilateral development banks do? Working Paper 74, European Bank for Reconstruction and Development, London, UK, June 2002.
- Eduardo Engel, Ronald Fischer, and Alexander Galetovic. Licitación de carreteras en Chile. *Estudios Públicos*, (61):5-38, 1996.
- Eduardo Engel, Ronald Fischer, and Alexander Galetovic. Least-present-value-of revenue auctions and highway franchising. *Journal of Political Economy*, 109(5):993-1020, 2001.
- Eduardo Engel, Ronald Fischer, and Alexander Galetovic. The basic public finance of public-private partnerships. Working paper 13284, NBER, accepted by the *Journal of the European Economic Association* (2011), July 2007.
- Eduardo Engel, Ronald Fischer, and Alexander Galetovic. The economics of infrastructure finance: Public-private partnerships *versus* public provision. *European Investment Bank Papers*, 15(1), 2010.
- José Luis Guasch. *Granting and Renegotiating Infrastructure Concessions: Doing it Right*. The World Bank, Washington, 2004.
- John T. Hodges and Georgina Dellacha. Unsolicited infrastructure proposals: How some countries introduce competition and transparency. Working paper 1, Public-Private Infrastructure Advisory Facility (PPIAF), PPIAF c/o World Bank, 1818 H. Street, Washington, DC 20433, 2007.
- Tim Irwin. *Government Guarantees: Allocating and Valuing Risk in Privately Financed Infrastructure Projects*. The World Bank, 2007.

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