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Urban Transport: Can Public-Private Partnerships Work?

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Abstract

Poor maintenance, slow expansion of streets and urban highways and excessive congestion are chronic in many cities. This chapter argues that public-private partnerships (PPPs) can be used to improve the timing of new investments, ensure adequate maintenance of highways and streets and manage congestion with road user charges. Nevertheless, PPPs will only work with timely public planning, deft contract design and enforcement and competent inter jurisdiction coordination. Moreover, to reflect the fact that PPPs do not relieve the public budget and ensure that PPPs are preferred over public provision based on efficiency criteria, fiscal accounting of PPPs must be identical to fiscal accounting of public projects.

¹ Almost all what is of value in this chapter was developed over many years in joint work with Ronald Fischer, and follows work summarized in Engel et al. (2013a). All remaining mistakes and inaccuracies are our fault, however.

1. Introduction: transport and cities

Cities exist, grow and prosper because they take advantage of scale economies and specialization wrought by agglomeration. Nevertheless, growth in output inevitably stresses existing transport infrastructure because it requires space and mobility. Moreover, wealthier people use more space, buy cars and move around more.

To prevent congestion from swamping the benefits of agglomeration and ensure a healthy expansion of the supply of urbanized land, cities must invest in transport infrastructure. Yet the balance between the growing demand for infrastructure and its supply is often difficult to maintain. Poor maintenance of existing streets and highways, slow expansion of capacity and excessive congestion seem to be endemic in many cities around the world.

It seems fair to say that many urban commentators would not agree that slow capacity expansion is a problem. On the contrary, they blame excessive congestion on a somewhat irrational preference for car travel, in their view a harmful side effect of urban life akin to pollution or noise. In this view building more infrastructures, especially highways, just fosters sprawl and is ineffective against congestion---Mogridge's paradox says that people respond to more capacity by driving more and wasting even more time. One of the central tasks of policy makers and planners, thus, is to control and curb the preference for car driving. Among the policies advocated by those favoring this view are zoning regulations to foster compact living, affect the spatial distribution of activities and reduce the number of trips; taxes and restrictions to increase the cost of owning and driving cars; and subsidies to public transportation.

Our perspective in this chapter is rather different. Our premise is that space and mobility are both factors of production and consumption goods with positive income elasticity. That said, the conventional provision of transport infrastructure suffers from three important shortcomings. One is compellingly described by Heggie and Vickers (1998, p. 19):

[Roads] are not managed as part of the market economy with its formidable pricing dynamic. There is no clear price for roads, road expenditures are most often funded from general tax revenues, and the

road agency is not subjected to any rigorous market discipline. This biases managerial incentives. Roads are managed like a social service with multiple goals. Road users pay taxes and user charges, but the proceeds are almost always treated as general tax revenues. Instead of being financed through user charges, roads are thus financed through budget allocations determined as part of the annual budgetary process. These allocations bear little relationship to underlying needs [...] or to users' willingness to pay. There is [...] no direct link between revenues and expenditures [...], no price to ration demand [...], and expenditures are not subjected to the rigorous tests of the marketplace [...].

It is also the case that funding to maintain and expand streets and urban highways is endemically short in many cities. Last, because streets and urban highways are interconnected networks, planning at the city level and coordination among different jurisdictions (e.g. among municipalities or between local and regional or national authorities), is necessary. Yet planners are often hamstrung by lack of both formal authority and real authority to cut through the cobweb wrought by multiple authorities and jurisdictions. Can Public Private Partnerships (PPPs) deal with these problems better than conventional public provision and ensure proper maintenance, timely expansion and less congestion? This is the question we address in this chapter.

2. PPPs: what they can do and what they need to work

2.1 What is a PPP?

Let us begin by briefly describing what a PPP is and how it compares with conventional provision of infrastructure.

When delivering infrastructure, governments face three challenges: deciding what and when to build, building in a cost effective way, and ensuring proper maintenance and service quality thereafter. Until recently, highways were considered public goods. As such, they were built by governments, funded with budget appropriations, and managed by ministries or public agencies. But during the last 25 years many countries have introduced a

different contractual agreement, the so-called public-private partnership or PPP which has been used extensively around the world to build roads, bridges and tunnels.

Figure 1, panel (a) shows how a PPP works. A PPP bundles finance, construction and operation into a single long-term service contract between the government's procurement authority and a stand-alone private firm---the so called special purpose vehicle (SPV). The SPV is in charge of building and operating a legally and economically self-contained project for a long time---usually between 10 and 30 years.

On the financing side, the SPV pledges the cash flows generated by the project, which may come from tolls or payments from the government, to pay back both equity and debt financiers.² Because the focus of the SPV is narrow, there is little scope to divert funds to other divisions, and PPP deals are usually highly leveraged.

On the production side, the SPV is in charge of hiring a firm to build the facilities and then of operating the project and maintaining the infrastructure. After the contract ends, assets revert to the government.

It is useful to contrast a PPP with conventional provision. As Figure 1, panel (b) shows, under conventional provision the government directly deals with financiers, the builder and the operator. On the financing side, the project is financed with public debt and budget appropriations. On the production side, a government agency hires the builder and then the operator. This basic structure admits many variations, usually influenced and sometimes determined by the particulars of the laws and institutions of countries, regions and cities. Sometimes only one public institution (e.g. a ministry of the central government or a city authority) is in charge of the whole process. But quite often tasks are split between different levels of government, agencies or even within the same government institution. It is important to keep this fact in mind, because in practice PPPs have been usually inserted in this preexisting structure and inherited many of its shortcomings. If they are used in cities, it is naive to expect that radical institutional reform will be adopted before introducing them.

Note also that Figure 1 omits the source of funding---tolls or government transfers. This omission is intentional, for both PPPs and conventionally procured projects may rely on

² This financing technique is known as project finance. See Yescombe (2002, 2007).

one, the other or a combination of both. In practice there are many public toll roads around the world and, conversely, many PPPs are funded with budget appropriations.

2.2 When?

Part of the appeal of PPPs stems from the glaring shortcomings of public provision. When PPPs began to spread around the world many believed that private participation in infrastructure would by itself improve performance. To some extent, this prejudice is warranted. Public agencies in charge of infrastructure projects (e.g. ministries of public works, city governments or municipalities) tend to have multiple objectives and are accountable to multiple principals, which weakens incentives. Moreover, for good reasons management practices in the public sector are more rigid and public agencies are constrained by annual budgets. Public managers can neither use the earnings of their organization to reward employee's performance nor freely allocate factors of production—constraints imposed by the legislature and the administration limit hiring, purchasing, contracting and organizational structures.³ These constraints also imply that the design of institutions that manage infrastructure is seldom concerned with efficient scale and scope. Thus, while many infrastructure projects are large enough to require independent management and most scale and scope economies can be internalized by specialized service providers---e.g. construction companies or maintenance contractors---, public agencies tend to be mega managers in charge of all the infrastructure of a given jurisdiction (sometimes the whole country) whose size is well beyond the efficient scale of operation. When thinking about infrastructure in cities, poor maintenance of streets and urban highways is perhaps partly due to excessive scale of the institutions in charge of them.

PPPs, by contrast, are the opposite type of organization. Because each project is managed by an SPV, their focus is narrow and incentives naturally sharp. Moreover, because SPVs are private firms, management is not constrained by public sector rigidities and their goal is private gain. Last, it is far easier to pitch each PPP to its efficient scale of

³ See Wilson (1987, ch. 7).

operation. All in all, PPPs substitute private management practices, incentives and focus for public sector rigidities, weak incentives and excessive scale.

In retrospect, however, it is easy to see that the view initially held by many that “privatization” via PPPs would work as liberalization of, say, international trade or goods markets, was naïve. PPPs do not release governments from most of their duties. On the contrary, with single-project firms and temporary concessions, the government retains discretion to plan and coordinate network expansion as demand grows over time. Just as with public provision, performance heavily depends on the quality of public project selection and appraisal. Moreover, public authorities must still manage externalities, ensure rights of way so that projects can be built, enforce project delivery and monitor contract execution thereafter. Thus, while PPPs take some responsibilities off the government’s shoulders, at the same time they make the task of public authorities even harder because they have an additional agent to deal with.

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2.3 How?

An economic characteristic that is central to transport infrastructure is that there is large, mainly exogenous demand risk---it is next to impossible to predict initial use and its growth rate. Demand forecasts depend on estimates of the macroeconomic cycle, which are tied to

the aggregate performance of the economy, and estimates of microeconomic conditions, which reflect local demand fluctuations. It may also stem from uncertainty about changes in the income elasticity of demand for motor vehicles and, when tolls are charged, uncertainty about the toll elasticity. Either of these sources of risk may throw off demand forecasts, which are usually inaccurate in the short term (three to five years) and all but useless in the long term.

Consider, for example, the Dulles Greenway, a 14 mile (22.5 km) road joining Leesburg, Virginia, with Dulles airport in the Washington, D.C., area. When the concession was granted in the mid-1990s, two consulting companies independently forecast a ridership of 35,000 vehicles a day if the toll was set at U.S.\$1.75. Actual traffic turned out to be 8,500 vehicles a day, partly because consultants underestimated how much users dislike paying tolls and partly because they did not take into account the State of Virginia's widening of the congested and untolled Route 7, which serves the same users. While in this case demand risk was partly policy related it was beyond the firm's control and thus exogenous.

The presence of large demand risk implies that risk sharing is an essential element in the design of a PPP contract. Consider first PPPs that can be funded with tolls. Despite large demand uncertainty, it is often the case that tolls will eventually pay for the project, with the question being how long it will take. For example, even though demand for the Dulles Greenway turned out to be much lower than expected, accumulated toll revenue would have eventually paid for capital and operating expenses. For projects which will eventually pay for themselves a particular type of flexible-term contract, known as a present-value-of-revenue (PVR) contract, offers a number of attractive properties. Under a PVR contract, the regulator sets the discount rate and toll schedule, and firms bid the present value of toll revenue they desire. The firm that makes the lowest bid wins, and the contract term lasts until the winning firm collects the toll revenue it demanded in its bid.

A PVR contract reduces risk: when demand is lower than expected, the franchise period is longer, while the period is shorter if demand is unexpectedly high. Under the assumption that the project is profitable in the long run so that repayment eventually can occur, all demand-side risks have been eliminated. This significantly reduces the risk premium demanded by the firm vis-à-vis fixed term concessions (for example, by an amount equal to

one-third of the upfront investment in the case considered by Engel, Fischer, and Galetovic, 2001, and by an even larger amount in the case considered in Albalade and Bel, 2009). This should attract investors at lower interest rates than fixed term PPPs. Annual user fee revenues are the same under both franchises, but the franchise term is variable under PVR. If demand is low, the franchise holder of a fixed-term contract may default; in contrast, a PVR concession is extended until user fee revenue equals the bid, which rules out default. The PVR bondholders do not know when they will be repaid, but that is less costly than not being paid at all. Another advantage of reducing demand risk is that it mitigates the winner's curse and bids become more cost oriented (Tirole, 1997).

The flexibility incorporated into PVR contracts is convenient for urban highways. Setting the appropriate ex ante toll for these projects is a complex task. Unless traffic forecasters are unusually fortunate in their estimates, the resulting tolls are likely to be incorrect—sometimes so low that they create congestion, other times so high that the highway is underutilized. In a PVR franchise, the regulator could set tolls efficiently to alleviate congestion, without distorting the incentives of the concessionaire.

When tolls are not feasible the government can pay a fixed periodic fee, contingent on the service quality standard being met---the so-called availability contract. Availability contracts have become increasingly popular in many countries, including France, the United Kingdom, and the United States. The government selects an SPV to build public infrastructure. In exchange for the project services, the government pays the SPV a fee called a *unitary payment*, which covers principal and interest on the debt plus a return to the SPV's shareholders, known as the sponsors or the private party. In addition, the SPV receives an amount based on the expected operating cost for the services, which covers the costs of operations, maintenance, and service provision. The government guarantees that the quality of service keeps to the standards specified in the concession contract by making regular payments conditional on the contracted service being available.

Availability contracts are often auctioned to the firm that demands the lowest annual payment. The resulting contract then involves no demand risk. Availability payments pay for the upfront investment, and the concessionaire makes a normal profit on this investment regardless of demand realizations. This contract is optimal if no tolls can be charged.

Availability contracts can also be used to maintain a network. For example, in the summer of 2007, Missouri's Department of Transportation selected a single consortium to rebuild or replace 800 bridges in need of repair and manage them for a minimum of 25 years. The rebuilding and maintenance costs were estimated to lie between US\$400 million and US\$600 million, with the State of Missouri making annual payments once the works were completed. The contract provides strong incentives for the consortium, via fines that apply if contract specifications are not met. For example, the company must pay \$500 per bridge per day for delays beyond the original construction deadline, US\$2,000 per day of closure, and US\$2,000 per day per structure that fails to meet quality levels set out in the contract. Similarly, cities could allocate the maintenance of streets to a concessionaire in exchange of meeting service standards.

2.4 The role of institutions

PPPs cannot exist in a country unless certain preconditions are met. Most importantly, there must be some certainty about the continued protection of property rights, including those arising from contracts with the government agency that signs the contract. Otherwise, private firms will not commit large upfront investments that will be paid by future revenue flows (tolls and availability payments), or if they do, they will demand a prohibitively high premium to bear this risk. A well-developed financial market also helps because it allows firms to securitize the project locally after it is built, without paying large premiums to compensate for exchange rate uncertainty and country risk. PPPs are not an option when property rights protection is weak, and the government should then strive to improve public provision for infrastructure provision.

3. Pitfalls with PPPs

3.1 Public finance and PPPs

Perhaps the main misconception about PPPs is that they liberate public funds. In reality, they affect the intertemporal government budget in much the same way as public provision. It is true that with a PPP the current government saves the initial investment outlay. But then it either relinquishes future user fee revenue (if the PPP is funded with tolls) or future tax revenues (if the PPP is funded with payments from the government budget). Hence there is no *prima facie* financial reason to prefer PPPs over public provision.

Confusion about the intertemporal nature of PPPs is behind one of the most glaring and widespread defects of PPP programs, their use to anticipate spending. Because fiscal accounting rules keep most PPPs off the balance sheet, governments have used them to sidestep the normal budgetary process, much in the same way that off-balance sheet vehicles helped banks to elude capital requirements and prudential regulation during the recent financial crisis.

Similarly, some governments have used PPPs to sell the cash flows of existing infrastructure, and used part of the proceeds to finance current expenditures; this danger seems to be rather large in cities as the recent case of the Chicago Skyway suggests.⁴ The Chicago Skyway is a 7.8 mile (12.6 km) six-lane median-divided toll road in Chicago, Illinois, which links downtown Chicago to the Illinois-Indiana state line. The Skyway was initially developed by the City of Chicago in 1959, with bond financing linked to toll revenue. However, the City was unable to raise tolls enough to service the debt and had to be ordered by the courts to increase user fees. Even then, the first principal payment (after paying off all interest due) was only made in 1991, when the financial situation of the project improved due to congestion on alternative non-toll roads. After retiring the original bonds in 1994, the city made no further toll adjustments until it leased the project in 2005.

From this point on, the city started using the revenue from the Skyway to fund other transportation projects and began to anticipate the revenues from the Skyway by issuing

⁴ This is based on Cheng (2010).

bonds in 1996 for the same purpose. In 2004 the City issued a Request for Qualifications that brought in five qualified bidders for a 99 year lease of the Chicago Skyway. The bidders competed for the operations and maintenance of the highway in exchange for toll revenues according to a predetermined toll schedule. There were three active bidders, with an undisclosed reservation price estimated to lie between \$700 million and \$800 million. The winning bid of \$1.83 billion was submitted by Cintra-Maquarie. The other two bids were well under a billion dollars, providing some indications of the winner's curse. Cheng (2010) estimates that under all reasonable demand scenarios, Cintra-Maquarie paid too much for the project.

Three points stand out from this case study. First, major toll increases were pushed into the future, past the end of the then-current mayor's term of office. Second, before leasing the Skyway, the city procured an exemption from leasehold taxes for the facility, thus raising its current value at the expense of future revenues. Finally, the lease term proposed originally was 55 years, but the actual lease was 99 years at the insistence of potential bidders. A possible explanation for the insistence of bidders for an extremely long lease term could be associated tax advantages. A private entity with a sufficiently long lease gains asset ownership and can include depreciation as an expense for federal tax purposes. As reported in the company's financial statement, the depreciation expense for 2009 and 2010 amounted to \$18.9 million for the Chicago Skyway.⁵ Cheng (2010) shows that the PPP was financially convenient for the city, because only under implausibly optimistic expectations of traffic growth and an undemonstrated ability to raise tolls would it have been able to generate the amount of discounted revenue it received from the winning bid. There are other potential efficiency gains from private management (more efficient maintenance and operations), but their impact is relatively minor (operating costs fell by 11 percent, a gain of \$1 million a year). Efficiency gains should thus have a correspondingly small impact on the overall valuation of the facility.

The short-term political benefits of the program were important. Part of the debt was used to retire Skyway bonds and City debt, and \$500 million was put into a long-term reserve. The remaining \$475 million went into discretionary funds, of which the City had spent 83 percent as of 2010.

⁵ For the Indiana Toll Road, depreciation expenses during 2009-2010 added to \$73.6 million.

What can be done against spending anticipation and accounting shenanigans? It can be shown that from the point of view of their fiscal impact, PPPs should be treated much like public projects.⁶ Hence, whatever accounting rules are followed with conventional provision, these should also be used to account for PPPs. Nevertheless, few if any *national* governments have adopted sound accounting rules and one suspects that neither will cities keen to experiment with PPPs. Until this occurs spending anticipation will remain a driver behind PPPs.

3.2 PPPs and renegotiations

PPP concessions are routinely renegotiated, often to the detriment of the public purse. Industry participants often claim that circumstances change over the life of a concession. While there is some truth to this argument, it ignores that renegotiations often occur shortly after contracts are awarded and that they tend to favour concessionaires. For example, 78 percent of the amounts awarded in renegotiations of PPPs in Chile were brokered during construction, shortly after the concession was awarded (Engel, Fischer, Galetovic and Hermosilla, 2009). And most renegotiations imply paying more for the works than originally contracted. Thus, while in principle renegotiations may allow governments to expropriate concessionaires after they have sunk their investment, in practice it seems that the private partner benefits the most.

Contract renegotiation may be justifiable when the environment changes, new information arises, or design errors are discovered. In these cases, all parties, including the public, may gain from renegotiation. In other cases, however, the only reason to modify the contract has been to benefit either the procuring authority (in the case of expropriation of the PPP, for example) or the project sponsor (by helping a failing project, offering a term extension or lowering the technical standards)—or both these parties at the expense of users or taxpayers. In practice, it is difficult to discriminate between justifiable and unjustifiable renegotiations. Even when renegotiations are justifiable, the resulting agreement may not be fair, given that renegotiations occur in a situation of bilateral monopoly.

⁶ See Engel et al. (2013b).

To make opportunistic renegotiations less likely, an independent panel of experts should ensure that the change in discounted profits that results for the concessionaire from any proposed contract renegotiation is close to zero. A recent wave of reforms of existing PPP legislation in various countries in Latin America has implemented proposals along these lines.

3.4 Flexibility and adaptation to changing circumstances

Circumstances change over the life of a long-term contract. If demand grows faster than expected, the PPP facility may need to be enlarged before the current concession ends; or if the original user-fee schedule proves to be inadequate, it may become desirable to change it. In those cases, one would like to grant the regulator flexibility to change the contract and, perhaps, even to terminate it unilaterally. This would facilitate regulatory takings, however, so many contract clauses restrict discretion to protect concessionaires.

The tension between protecting the concessionaire from regulatory takings and avoiding the costs of inflexibility can be illustrated with a recent U.S. PPP concessions. In 1995, the California Department of Transportation (Caltrans), awarded a 35-year concession for a 10-mile segment of the four-lane Riverside Freeway (also called State Route 91) between the Orange-Riverside county line and the Costa Mesa Freeway (State Route 55) to a private firm, California Private Transportation Corporation (CPTC). Motorists use the express lanes to avoid congestion in the non-tolled lanes, paying up to almost \$11 for a round trip. The concessionaire was allowed to raise tolls to relieve congestion, which it did several times. By the late 1990s, 33,000 daily trips brought the express lanes to the brink of congestion at peak time, turning the concession into a financial success. At the same time and for the same reasons, users in the non-toll public lanes were suffering congestion, and an expansion became urgent. Nevertheless, the contract included a non-compete clause that prevented Caltrans from raising capacity at Riverside Freeway without CPTC's consent during the 35 years of the concession. Caltrans tried to go around the clause, arguing that expansions were necessary to prevent accidents, but CPTC filed a lawsuit. The settlement stated that non-compete clauses were meant to ensure the financial viability of CPTC and

that they restrict Caltrans's right to adversely affect the project's traffic or revenues. Consequently, no new lanes could be built.

Protracted negotiations ensued, and eventually the Orange County Transportation Authority (OCA) was empowered to negotiate the purchase of the tolled lanes. Unfortunately, the value of the toll road was controversial since, strictly speaking, it should have been the present value of profits from the State Route 91 Express Lanes had the franchise continued as originally planned. Although the lanes cost \$130 million to build, initially the company's value was set at \$274 million in a controversial (and ultimately unsuccessful) attempt at a buyout by a nonprofit associated with Orange County. After several years of negotiations, with frustrated commuters stuck in traffic in the meantime, the express lanes were bought in January 2003 by OCTA for \$207.5 million. The purchase was enabled by the California legislature, which gave the OCTA the authority to collect tolls and pay related financing costs and also eliminated noncompete provisions in the franchise agreement to allow for needed improvements on State Route 91.

In principle, the government should be able to unilaterally buy back the concession, provided that it pays a fair compensation for the profits forgone by the franchise holder—that is, the expected present value of future profits had the concession continued under the original terms. The problem is that with a fixed-term concession, like Orange County's State Route 91, this amount cannot be deduced from accounting data and is highly subjective. Neither discretion nor bilateral bargaining leads to an efficient solution.

Engel et al. have shown that either a PVR contract (in the case of projects funded with tolls) or an availability contract can be structured so that the government retains almost full flexibility, while the concessionaire is protected against arbitrary takings. For example, in the case of PVR, it suffices to add a clause allowing the regulator to buy out the franchise by paying the difference between the winning bid and the discounted value of collected toll revenue at the time of repurchase (minus a simple estimate of savings in maintenance and operations expenditures due to early termination). The compensation in the case of an availability contract is similar. In both cases the government bears the risk of early termination, which is desirable because this risk is beyond the concessionaire's control. Termination under PVR or availability contracts is independent of future demand and is therefore verifiable. Thus, the winning bid minus the payments already received by the

concessionaire equals the fair compensation. In this case, the government cancels the contract only if doing so is efficient. Because the government can cancel the contract at its discretion, renegotiations are no longer protracted or inefficient.

3.3 Coordination, multiple jurisdictions and decentralization

Urban regulation developed in industrialized countries during the nineteenth and early twentieth centuries to control negative externalities, which are inherent to cities. In principle, there are several ways of mitigating externalities, like taxes, controls, private bargaining or contracts. In practice, however, they are almost exclusively managed with top-down controls and regulations. The result has been a system of laws, controls, planning regulations and zoning laws, specifying what can be done and where. This system is in charge of many authorities--- national, regional, city and local governments. Sometimes, even authority within one level of government is dispersed among different agencies. As a result jurisdictional conflicts are quite common. Perhaps one of the main challenges faced by a PPP program is to become enmeshed in this preexisting system and deal with it. There are no general rules that say how this is to be done, because the distribution of decision power varies from country to country.

The tension between PPPs and preexisting urban regulations and institutions is rather fundamental. As we have already said, a successful PPP program requires long-term public planning. Moreover, a planner must have formal and real authority to implement and execute it. But the plan's execution will inevitable involve dealing with other agencies and different levels of government. Many times these agencies will have a say in what can be done, when it can be done and how; sometimes they may be pivotal to ensure the projects' execution. Moreover, the interests of each local authority may clash with the interest of society overall, especially when one jurisdiction bears costs wrought by the infrastructure but few of the benefits. Of course, achieving inter jurisdiction coordination is hard enough under conventional provision. But PPPs add an additional layer of complexity because there is a long-lived contractual obligation with the concessionaire. Somewhat paradoxically, this contract makes inter jurisdiction coordination harder, because they add

another constraint to the set of agreements that can be reached between different authorities. To some extent, PPPs may also stand in tension with decentralization, as the need for planning, and coordination may require local governments to surrender part of their authority to the agency in charge of the PPP program.

3.4 The PPP premium

A recurrent criticism of PPPs is that they cost more per dollar of financing than public debt—the so-called PPP premium. The numbers that have been quoted for this cost difference vary widely. According to Yescombe (2007, p. 18), the cost of capital for a PPP used to be 200-300 basis points higher than the cost of public funds. This cost has doubled since the credit crisis. He also shows that the spread over the lender's cost of funds lies in the range of 75-150 basis points, with highway projects being on the upper limit (Yescombe, 2007, p. 150). Hence, the argument goes, when governments decide between public provision and PPPs, they tradeoff a lower cost of funds under public provision against the supposedly higher efficiency of a PPP.

Other authors, however, argue that there is no PPP premium. One line of argument claims that bondholder risk under public provision is subsumed under general government default risk. Moreover, public debt is cheaper because the public implicitly absorbs the risk through potentially higher taxes or lower public expenditures in case of imminent default on all government debt.

Financial economists distinguish between systematic risk—those that vary systematically with the market or the economy—and project-specific risk. The project's systematic risk cannot be diversified and should affect public and private financing costs in the same way. On the face of it, is there a reason to think that the public sector can be better at diversifying exogenous, non-systematic risks than PPP financiers? The answer is probably “no.”

Consider exogenous demand risk first. In the case of highways one can show that even if the government had an advantage in risk-bearing, either a PVR or availability contract assigns all exogenous risk to the government. Consider next endogenous risks, which the

concessionaire can control. One of the main points of a PPP is to shift these risks to the concessionaire to prevent moral hazard and strengthen incentives to cut costs and provide adequate service quality. Unless the concessionaire is risk neutral, he will charge for bearing that risk. Moreover, these risks are not diversifiable in the capital market; if they could be diversified, then there would be no incentive to improve performance in the first place and the agent would indulge in moral hazard! It follows that the question is whether shifting risks to the concessionaire buys an improvement in performance that justifies the higher cost of risk bearing.

Note also that should the government use an incentive contract to improve performance under public provision, it would have to transfer risks to an agent and pay him accordingly. The cost of preventing moral hazard under public provision---a risk premium---, should then be added to the public sector cost of financing. Of course, such an adjustment is never done before comparing---hence the PPP premium.

4. A case of prescient planning and successful PPP implementation

Figure 2 shows a map of Santiago, Chile's capital city.⁷ Between 2000 and 2008 a 225 km long system (140 miles) of urban highways, which is shown in blue lines, was built in Santiago. The system was divided in 8 PPP concessions. Most of the funding of the \$3 bn. investment comes from tolls paid by users over 20 to 30 years. Tolls are charged according to usage and time of the day with an electronic device attached to each car, which registers both the location and the time. Each month, users receive a bill and pay it like any another utility. Tolls vary according to congestion and were fixed in each PPP contract.

How was it possible to build this system of highways in less than 10 years? The PPP program was planned and executed by a PPP division in the Ministry of Public Works, which has authority over streets and highways that span several municipalities. Urban PPPs were part of a broader national plan to upgrade Chile's interurban highways via PPP concession. The program began in the early nineties and law was passed in 1996 to regulate

⁷ According to the latest census, taken in 2011, 6,2 million inhabit Santiago's metropolitan area (*Gran Santiago*), and the city covers 711,2 square km (71.120 ha or 274,6 square miles). Densities are 8,700 inhabitants per square km, 87 per ha or 22,578 per square mile. *Gran Santiago* is divided in 37 municipalities.

concessions. Studies to build urban highways in Santiago began in the early nineties, and PPPs were put to tender between 2000 and 2005.

Yet the origin of a system of urban highways dates back almost 60 years to the late 50s and early 60s. In 1960 the Ministry of Public works issued its Santiago plan PRIS (Spanish acronym for intercomunal urban regulation plan. Planners anticipated that Santiago's rapid growth, which had begun in the 1940s, would change its nature.⁸ Santiago would no longer merely grow around the traditional center, but would eventually become a polycentric city covering a substantial and ever-expanding area. It was therefore crucial to plan and build streets communicating subcenters and municipalities of the metropolitan area, avoiding radial trips passing through the center of town. The plan thus anticipated the investments in transport that would become necessary in the future, reserved strips of land for future roads, and set to gradually execute the investments to put the plan to work. When PPPs came 40 years later most roads were already there, though in need of a substantial upgrade. Thus, Santiago's successful urban highway PPP program shows why prescient planning and coordination is necessary.

5. Conclusion

We began this chapter asking whether PPPs can help to improve maintenance of streets and urban highways, ensure timely expansion of capacity and relieve excessive congestion. Our conclusion is that PPPs can help, but cannot substitute for good government. On the contrary, in many dimensions the task of governments is harder and more demanding under PPPs. To conclude we briefly summarize the role that PPPs can play in the provision of urban transport infrastructure.

PPPs can go a long way ensuring that transport infrastructure is properly maintained. They are structured on a long-term contract that forces the government to fund the SPV in charge of the infrastructure. Moreover, if adequate maintenance and service standards are

⁸ Between 1940 and 1960 Santiago's population roughly doubled, from about one to two million. Santiago's surface doubled as well, from about 100 square km to 200 square km (10,000 to 20,000 ha or 38 to 77 square miles). By 1970 population would increase by another million and surface would grow an additional 100 square km.

written into the contract and noncompliance punished, it will be in the concessionaire's interest to comply.

In addition, PPPs foster productive efficiency, because the concessionaire is a private firm and is not hamstrung by the typical constraints that a public manager must obey. On the contrary, it can freely choose factors of production and reward them contingent on performance. Moreover, the SPV has a narrow focus, answers to only one principal and its scale and scope can be made to fit the efficient scale to perform the task at hand.

While it is not necessary to fund PPPs with tolls, PPPs seem to offer an opportunity to make tolls politically acceptable. Because free-flow tolling is now feasible, tolls could be charged to address congestion externalities, ensure an adequate mix between public and private transportation and partly finance maintenance and new infrastructure. Indeed, there is no good argument of principle against charging for transport infrastructure: there is congestion, streets, highways are rival goods, and technology now makes them excludable. Moreover, it can be shown that making users pay for infrastructure is good public finance. Perhaps we should pay for using streets just as we pay for water, electricity or garbage collection.

Of course, tolls would need to be regulated by a public body. Moreover, SPVs cannot ensure proper and timely expansion of transport networks, because planning, a long-term endeavor, must remain in the hands of a public body with authority to reach inter jurisdiction coordination and ensure rights of way. Also, a public body must be in charge of project delivery and another of monitoring contract compliance and enforcing service standards. If these preconditions are met, PPPs are certainly suited to build, operate and maintain urban highways. But they can also be used to maintain streets. To do so, a city can be divided in different sectors and each allocated to a firm in charge to maintain it under a long term contract.

The final observations are three precautions that should be borne in mind before embarking on a PPP program. First, PPPs should be chosen only if they improve efficiency. On the contrary, PPPs should not be chosen on the basis of their impact on the current public budget because from the fiscal point of view they have the same impact on the intertemporal budget as conventional provision. So far few if any countries have modified their accounting rules to acknowledge this fact and it seems unlikely that city governments

will do so. The temptation to use PPPs to anticipate spending is strong and casts doubts on their desirability.

Second, in a PPP the concessionaire's expenses are front-loaded, while revenue collection is back-loaded. This cash flow stream can only be attractive to private firms if they are reasonably confident that revenue streams will not be expropriated, that is, if the rules of law and property rights are strong. By contrast, when regulatory takings or expropriations are likely, only less risky, traditional public provision of infrastructure facilities is feasible, because the firm is paid earlier in the life of the infrastructure, on the basis of completed work. This basic insight suggests that PPPs are unattractive for many low-income countries with weak institutions and governments

Last, PPPs need even more sophisticated governance and public intervention than conventional provision: planning and project delivery; contract monitoring and enforcement; and inter-jurisdiction coordination. These tasks are imperfectly performed today and there is no reason to think that the mere adoption of PPPs will improve institutions. On the contrary, experience so far suggests that there are many pitfalls, and inadequate governance has been the rule.

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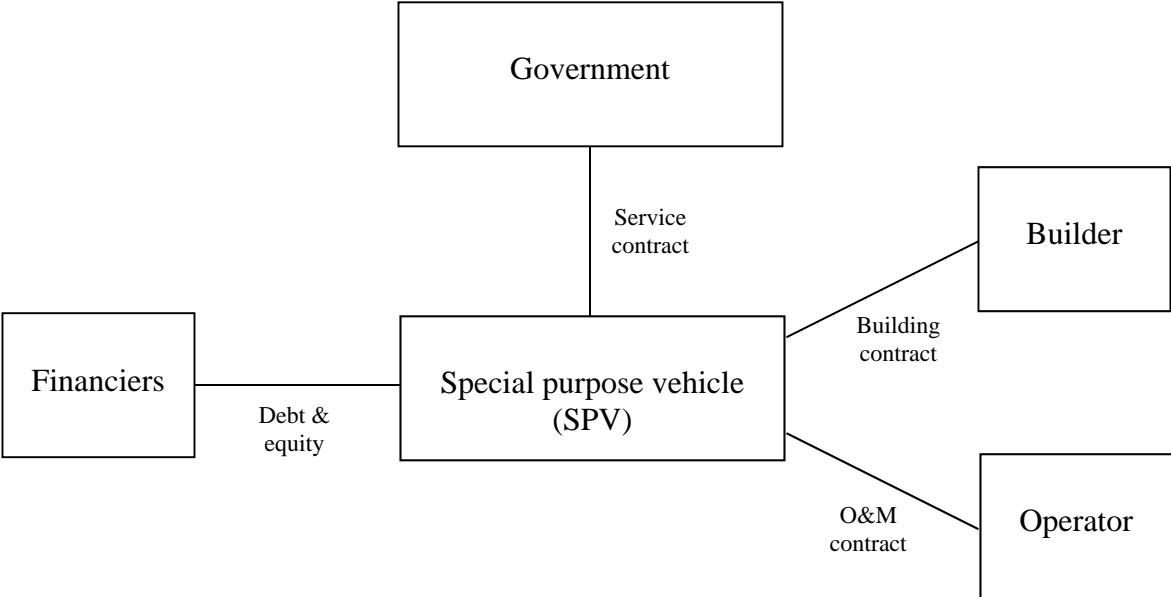
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Figure 1
Contracting under PPPs and conventional provision

(a) PPPs



(b) Conventional provision

