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private sector involvement in public
infrastructure projects**

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6

Public–Private Partnership

A Framework for Private Sector Involvement in Public Infrastructure Projects

Carlos Oliveira Cruz and Nuno F. da Cruz

Introduction

The delivery of public infrastructure has long been a key concern of political leaders, given its impact on economic competitiveness, quality of life, and social and economic cohesion, as well as its role as the backbone of local, regional, and national economic fabrics. Although investment in infrastructure has declined in recent years as a consequence of the economic crisis and its impact on governments' abilities to maintain public expenditure levels, there will be a massive need for investment in infrastructure over the next couple of decades. Governments around the world will need to raise over US \$57 trillion by 2030, according to McKinsey Global Institute (Dobbs et al. 2013). The World Bank (Rodriguez, van den Berg, and McMahon 2012) estimates a staggering US\$22 trillion is needed in developing countries. For water and sanitation projects alone, estimated needs in the short term amount to US \$103 billion per year (Yepes 2008).

Although infrastructure investment is currently a priority for emerging economies (Zhang 2014), there remains a lack of investment in the maintenance of existing infrastructure in advanced economies such as Germany, the United Kingdom, and the United States of America and especially in sectors such as transport or energy distribution (Hull 2008). The need for investment in infrastructure maintenance is already on the agenda of many advanced economies. The US\$300 billion bill for transport infrastructure development, introduced in 2014 by US President Barack Obama, and the Investment Plan

Carlos Oliveira Cruz, Nuno F. da Cruz

for Europe, announced by European Commission President Juncker in November 2014, are good indicators of this concern.

Therefore, regarding infrastructure development, the question to be answered is not whether to invest but rather how. Some basic considerations are in order. First, governments alone are not capable of leveraging such investment levels, and thus private financing is often a requirement. Further, public management of utilities and market-based sectors such as energy, telecommunications, and water supply has for years now been accused of inefficiency and lack of capacity to innovate.¹ Finally, the cost of private financing is higher than direct state funding through bonds or similar mechanisms (Boubakri and Cosset 1998; Megginson, Nash, and van Randenborgh 1994), and past experiences of full privatisation have also fallen short of expectations, leading to undesirable outcomes.² How then can public authorities ensure that value for money will be achieved?

Models for delivering and managing infrastructure have been changing alongside the trend of increased private sector involvement in traditional public administration affairs and sectors (Dunleavy 1986; Miranda and Lerner 1995). The privatisation and/or deregulation wave in many public services, especially transport, has changed the way infrastructure is managed, although private sector participation has not always delivered benefits as expected. For every case of failed privatisation, there are arguments invoked to justify the poor performance of the private sector. Usually these arguments revolve around macroeconomic changes, for example currency devaluation, or overestimated demand or government interference, such as changing the scope of the contracted projects or services, unilateral changes to tariffs, or new regulations.

Given the extreme polarisation of the two classic delivery models—public ownership versus full privatisation—and their associated benefits and pitfalls, public–private partnership (PPP) arrangements emerged as an intermediate model intended to provide the best of both worlds by assigning the private sector with more direct control over operations and allowing the public sector to focus on its core roles and regulatory functions. Public decision-makers and authorities have complex objective functions often involving concerns with public opinion, general welfare, respect for minorities, and other political and electoral matters (Jones 1994) that are difficult to harmonise with the

¹ Whether these accusations have been fair, let alone true, is still a contentious issue and one that is beyond the scope of this chapter. For some of the arguments on the superiority of private management of economically productive public assets, see Yarrow et al. (1986), Vickers and Yarrow (1991), Boycko, Shleifer, and Vishny (1996), Dewenter and Malatesta (2001), Megginson and Netter (2001), or D'Souza and Megginson (1999).

² A classic example is the privatisation of British Rail and subsequent bankruptcy of the new owner, Railtrack (see more in Gibb, Lowndes, and Charlton 1996 or Crompton and Jue 2003).

Public–Private Partnership

commercial management of a utility or public infrastructure asset. Although theoretically capable of capturing the benefits of private management while retaining a strong level of control by public authorities, experience has revealed relevant liabilities linked to the use of the PPP model, particularly when dealing with large capital investments and/or significant revenue risk, as discussed below. Regardless, the use of PPPs has experienced a remarkable expansion over recent decades around the world (see Burger and Hawkesworth 2013) and across different levels of public administration.

PPPs have been pitched as a way to increase the efficiency³ of infrastructure services while providing access to private capital in the context of growing shortages of public funding. Whereas the former should constitute the reasonable rationale for engaging in PPPs, empirical evidence suggests that the latter has been the primary driver for the surge of these arrangements. Until 2011, European Commission rules for the estimation of public deficits allowed governments to leverage the financing of national and local infrastructure development plans via PPPs by isolating their impacts on public budgets (Spackman 2002; EPEC 2010). The expenditure and debt associated with PPPs were considered ‘off balance sheet’, in other words not included in public deficit and debt calculation, thus bypassing budgetary constraints. This technicality distorted the rationale and potential benefits of PPPs and raised some fair criticism about the model: namely, the argument that PPPs were more a fiscal and financial engineering trapdoor than a procurement model to increase the productivity and allocative efficiency of public spending. Furthermore, the off balance sheet treatment provided by the existing public accounting rules allowed for the development of ‘white elephant’ projects with revenue streams that could barely match operating costs, leaving public authorities unable to cope with the debt service (Sadka 2006). The ability to deliver infrastructure now and pay later, sometimes after several mandates, created space for political opportunism where benefits were generated with lagged costs attached.

The PPP procurement model is still experiencing large expansion, particularly in emerging economies in Africa and Asia. But it is also gaining momentum in top performers such as in the USA, where state governments in, for example, Florida, Virginia, and California are producing legislation and promoting public discussions on where and how to use the model as a leverage tool to allow for the rehabilitation and upgrading of basic infrastructure, with a focus on the energy and transport sectors. Much of the expansion in the use of the model is based on the potential advantages of using PPP arrangements, such as the

³ Efficiency can be briefly defined as the ratio of outputs produced to inputs consumed in a certain activity. Efficiency can be increased by reducing inputs for the same level of outputs, increasing outputs for the same level of inputs, or simultaneously increasing outputs and decreasing inputs. In the case of public infrastructure projects and in simple terms, time and cost can be regarded as inputs and quality as the output.

Carlos Oliveira Cruz, Nuno F. da Cruz

possibility of having a more dynamic and goal-oriented approach to the management of public services through specialised international companies with profound know-how and the ability to implement best practices and the most innovative solutions. Furthermore, public debt restrictions also play a fundamental role in the growing use of PPPs. Over the last decades, it has been increasingly difficult for governments to leverage their infrastructure development plans solely with traditional public finance. Most infrastructure systems are capital-intensive and require significant capital availability during construction and/or expansion. Simultaneously, the finance sector sees infrastructure investment as a more stable solution, when compared to traditional investment in stocks and private bonds, providing shareholders and investors with a steadier inflow of capital over the long run. The rate of return may be lower than the equivalent investment in, for example, high-tech companies or financial institution stocks, but the uncertainty is also much lower. The combination of these drivers is the main reason for the acceleration of PPPs at the global scale. Today the discussion, both academic and professional, is mostly about how to improve the design, implementation, and management of PPPs rather than the search for alternatives.

Although the discussion around the emergence of PPPs cannot be disassociated from the discussion of privatisation (Gómez-Ibáñez 2003), these are different concepts, even though they are frequently used interchangeably, with PPP development often referred to as privatisation. It is therefore helpful to clarify the distinction between the two concepts at the outset. Privatisation means the material sale of assets *ad aeternum* or until the public sector buys back or nationalises the assets. In a privatisation process, the private sector can buy a company or a portion of shares, and from that moment on, that company or the shares become the private sector's asset.

PPP arrangements are different. The PPP universe is extremely wide and encompasses a variety of business models and contractual structures, each with distinct institutional strengths and weaknesses. There are several models of PPP—presented in greater detail in the following sections of this chapter—that may or may not include the ownership of assets, but even when the private sector owns an asset, it is for a limited period of time (the duration of the contract). After the termination of the contract, the assets revert to the public sector, which can choose whether to re-enter a PPP agreement or to assume direct management of the asset. Despite this technical but significant distinction, the term 'privatisation' is frequently used to refer to the delegation of responsibilities for operation from the public sector to the private sector in traditionally publicly-owned sectors like transport, environment, energy, and other services of general interest. In general, both in professional outlets and in academic research, most of what is referred to as the privatisation of infrastructure actually refers to PPP implementation and development.

Public–Private Partnership

This chapter presents a discussion on the PPP concept, the different models and approaches being adopted on the ground, and the economic rationale for taking the PPP route. Furthermore, on the basis of a comprehensive review of existing literature and the authors' own empirical research, it provides an ex-post evaluation of the performance and outcomes of PPP arrangements in various infrastructure sectors. The chapter concludes with some guidelines and prospective recommendations about trends concerning the use of PPPs in the medium- to long-term and key success factors for policy-makers and institutional leaders.

Concepts, models, and rationale

Given the prevalence of PPPs in the debate surrounding infrastructure governance and the various options for delivering infrastructure, some clarity regarding concepts, approaches, and rationales is required before more closely examining performance and outcomes.

Privatisation, project finance, and PPPs

As hinted at above, the PPP concept is often misguidedly used interchangeably with the concepts of privatisation and project finance. Under privatisation, the process involves selling assets or shares of a company owning certain assets. In a PPP, the private partner has the right to operate and possibly own an infrastructure asset but only for a pre-determined duration,⁴ unlike privatisation models. 'Project finance' concerns a financial technique in which lenders provide debt based on future cash flows. This is the only real asset, or guaranty, given that the high specificity of the sunk investment in an infrastructure project makes it non-tradable, with little or null book value in case of project default. Much of the interest of the public and private sectors in PPP financing is related to the project finance model that allows companies to leverage their investment capacity without a typical debt consolidation in their books like in corporate finance models. What might seem to be an accounting technicality is actually a large stimulus for private financiers.

The project finance structure of a PPP is highly complex. The structure of financing sources should be expected to change throughout the life cycle of a

⁴ There are cases where the duration is not fixed—for example, variable duration road concessions in Chile (Nombela and de Rus 2004)—but is still temporally constrained. In such a case, the contract will be terminated at some point, and the rule to calculate the moment of contract termination, for example contingent on total revenue, is clearly established upon contract signature.

Carlos Oliveira Cruz, Nuno F. da Cruz

project given mutations in its risk profile. During construction, banks and banking syndicates provide most of the financing and closely monitor contract execution. Even before construction, banks have an active role in the drafting and negotiation of a contract. During operation, when construction risk has dissipated, the profile of lenders can change towards that of bondholders, which have less control of and intervention into the project itself and generally have no interference in contract negotiation or renegotiation (Yescombe 2007). To move towards a model of bondholders, a project needs to have a controlled level of risk and an extremely low value at risk in order to minimise the exposure of the banks to losses.

Models of infrastructure delivery

PPPs are fundamentally a procurement model under which public authorities develop and acquire infrastructure assets and/or public services. Within the models of public procurement, there are traditional public works contracts. Under such an arrangement, governments can, for example, contract construction companies to build an infrastructure asset under particular technical specifications defined by the contracting authority—the government, a governmental agency, or a publicly owned company—and under applicable legislation. Once construction is finished, the public sector owner of the infrastructure asset is responsible for managing the asset and ensuring that services are delivered to the population adequately. In a PPP arrangement, on the other hand, the public authority establishes a long-term contract with the private partner for building or upgrading, managing, and eventually financing the infrastructure.

It is possible to summarise the main organisational forms for delivering public infrastructure according to three broad categories, each of which can be subdivided into several subcategories:

- **Public in-house delivery/management:** This can be performed under different models, such as government department, semi-autonomous entity, or public company. The public sector's relationship with the private sector is limited to contracting out the inputs necessary to perform the activity at hand, for example construction works, acquisition of equipment, and even ancillary tasks via short-term contracts. The public sector retains managerial and operational responsibility and interacts directly with citizens/users, suppliers, and regulatory authorities. Frequently, public authorities regard this model as one under which there is no need for regulation, given that the supplier—the government itself—intrinsically intends to protect the public interest. Not only is this not always true, but experience has shown that there should be a

Public–Private Partnership

clear delimitation of the state's role as an operator, shareholder, regulator, policy-maker, and legitimate representative of the people.

- **Full privatisation or divestiture:** This is the case when a transfer of assets and operational responsibility is unlimited in duration, and the role of the public sector will be restricted to external regulation. There are some examples of full privatisation of public services throughout the world, particularly in the UK, Chile, and the USA. However, in many jurisdictions, for example Thailand, it is a legal requirement to maintain essential public infrastructure assets under the public domain.⁵ In the case of full privatisation or divestiture, relations with users are handled only via the private company.
- **PPP arrangements:** Here the array of options is vast, but the rationale is that a private partner will have the responsibility of managing and delivering services, in some cases co-managing or co-delivering. This relationship is limited in duration, usually to the time necessary to depreciate the investment, for example thirty or forty years; ruled by a contract or series of contracts signed between the partners; and possibly also ruled by an independent sector-specific regulator. Relations with citizens/users depend on the actual model.

Types of PPPs

Within the PPP realm, there are several types of arrangements according to the various characteristics of the project to be developed (Ng and Loosemore 2007). Authors and official public institutions use distinct classifications that are not always compatible, but in general, these classifications are based on four criteria:

- **Financial characteristics of the project:** A PPP is defined as stand-alone when it does not require governmental subsidies, while a PPP is considered subsidised when the stream of revenues is not enough to ensure the economic equilibrium of the project;
- **Governance model:** A PPP can be of a purely contractual nature or of an institutional nature, as discussed further below;
- **Ownership:** The ownership of the assets can remain in the public domain during the whole life cycle or it can be held temporarily by the private

⁵ These legal requirements are generally linked to a political motivation of avoiding the control of infrastructure monopolies by private companies. Governments choose to vertically separate the system, in other words, separate the ownership of the physical infrastructure from service operation or management, allowing for private companies to bid for the control of operation.

Carlos Oliveira Cruz, Nuno F. da Cruz

partner, although the public partner may be required to pay a residual value for the transfer by the end of the contract;

- **Project life cycle stages included in the agreement:** A PPP can include some or all stages of the infrastructure life cycle, for instance design, financing, construction, maintenance, operation, and/or transfer. The classification of PPPs based on these stages gave origin to a series of acronyms that are well known within the PPP expert community: build-own-maintain (BOM), design-build-operate (DBO), design-build-finance-operate (DBFO), build-operate-transfer (BOT), and build-rent-own-transfer (BROT), among others.

These criteria are not mutually exclusive. In fact, it is common to find different classifications for PPP projects based on one or more of these criteria. One of the most commonly used terms to refer to PPPs is ‘concession’. However, a concession is merely one of the many possible forms of PPP, and even this particular form can be used with entirely different business models and contractual structures. Basically, a concession is when the government gives a private entity the sole right to exploit a certain service for a certain period of time (Delmon 2010). In some countries, such as France and Portugal, the term concession was used when private remuneration was only based on user fees and the government did not have to pay any compensation to the private partner, or concessionaire, similar to the ‘administrative concession’ defined in the Brazilian legislation.⁶ The use of the term has evolved, but the distinction between projects that have to be financed by the public sector and those that do not require public financing is still closely linked to the classification of PPP projects. Allen (2001) also uses the presence or absence of public subsidies to support the classification of PPPs and established three distinct types: 1) freestanding projects, for which there are no public subsidies, with the project subsisting on user charges; 2) joint ventures, in which there is a contribution from the public sector, while the concessionaire is responsible for managing the service; and 3) services sold, which corresponds to the case of full privatisation.

A common and clear classification is the one developed by the European Commission establishing two types of PPPs according to the legal status and governance model of the partnership (Yescombe 2007). The first type, contractual PPPs, refers to those cases in which the relationship between the public and private sectors is based solely on a written contract, for instance the aforementioned case of concessions. In this model, the public partner does

⁶ The PPP legislation in Brazil establishes two types of concessions: sponsored concession, which requires governmental subsidies, and administrative concession, for which the revenues generated by the project are sufficient (Pereira 2014).

Public–Private Partnership

not interfere in day-to-day activities, and there is no mixed capital company. In the second type, institutionalised PPPs, the public and the private sectors are partners in a new, third entity or in an existing public company that sells a percentage of its shares. Although necessary, mixed ownership is not sufficient to consider these companies institutionalised PPPs; among other requirements, a limited duration, the existence of a shareholders' agreement, and the transfer of risk the private partner are also mandatory. In the institutionalised PPP model, each partner has its own shares and managerial responsibilities, although most management responsibilities are usually held by the private actor, while the public partner performs an 'internal regulation' (da Cruz and Marques 2012b).

The boundaries of what is and is not a PPP are not always clear. In many countries and institutions it is possible to find contradictory classifications. There seems to be a general consensus, however, that in order for an arrangement to be classified as a PPP, the private sector needs to take on a significant level of risk. In fact, European Commission rules (see EPEC 2010) state that 'most of the project risk' must be transferred to the private sector for it to be considered a PPP arrangement, and for example, the assets may be considered off the public balance sheet.⁷ The problem is that there are no clear, quantitative measures to assess the level of risk allocated to one or more private partners. For example, in a transport project, for example a highway, the demand risk is usually one of the most impactful, but in many transport concessions this risk is greatly reduced, with the government providing revenue guarantees to ensure a more predictable cash flow.

Figure 6.1 presents an overview of several delivery models and defines what can be classified as a PPP arrangement. The scheme represents two main variables—level of control over service delivery and level of control over assets—and for each variable assumes a variation between public control and private control.

Contractual and institutionalised PPPs

A contractual PPP is typically structured around a special purpose vehicle (SPV) with juridical and economic autonomy and created for the single purpose of managing the project. The accountability implications of SPVs are manifold, but their main feature is the ability to compartmentalise financial risk, curbing the liabilities of shareholders. An SPV is necessary given the financing structure of PPPs. Private financing of projects can be done via

⁷ The European Commission has established three types of risk: construction risk, which is related to the activities of building the infrastructure; availability risk, which is related to maintaining the infrastructure with an adequate level of service; and demand risk, which is related to the inflow of users of the system (EPEC 2010).

Carlos Oliveira Cruz, Nuno F. da Cruz

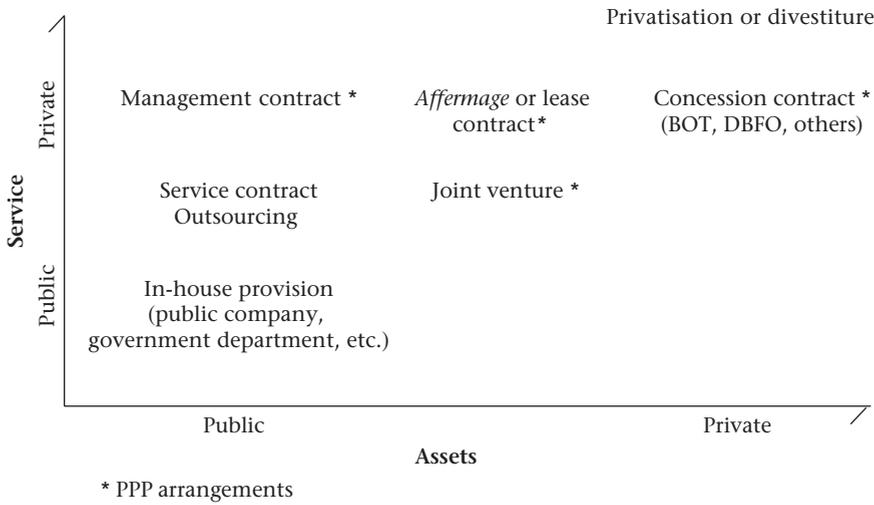


Figure 6.1. Examples of PPP arrangements

Source: Adapted from Delmon (2010)

corporate finance or project finance. The former constitutes a case in which debt is provided upon validation of the credit rating of a company. The latter provides debt based on a project’s cash flow, in this case the SPV. As mentioned above, while in corporate finance the assets of a company are the guarantee against a contracted debt, in project finance cash flow is the main guarantee for a lender. Although not exclusive to PPP projects, this financing structure is a key reason for the proliferation of PPP arrangements over recent years, given its ability to raise credit without leveraging the existing assets of the contracting parties and thus reducing their liabilities significantly. Figure 6.2 presents the typical contractual structure of a concession.

The creation of a purely instrumental SPV is not applicable to the case of institutionalised PPP arrangements. In fact, the creation of a mixed, public-private company is the main purpose of an institutionalised PPP. Unlike contractual PPPs, where the relationship between the partners is established through a rigid written contract and the private partner is solely responsible for delivering the services, with institutionalised PPPs the public and private partners join together in a single company to jointly manage and deliver the services. This complex arrangement is illustrated in Figure 6.3.⁸

In terms of the financing scheme, there are no major differences between contractual or institutionalised PPPs. The differences are mostly in terms of

⁸ Although mixed companies are usually directly responsible for operation and maintenance, particularly in local PPP arrangements, the delegation of these tasks to another entity is also possible.

Public–Private Partnership

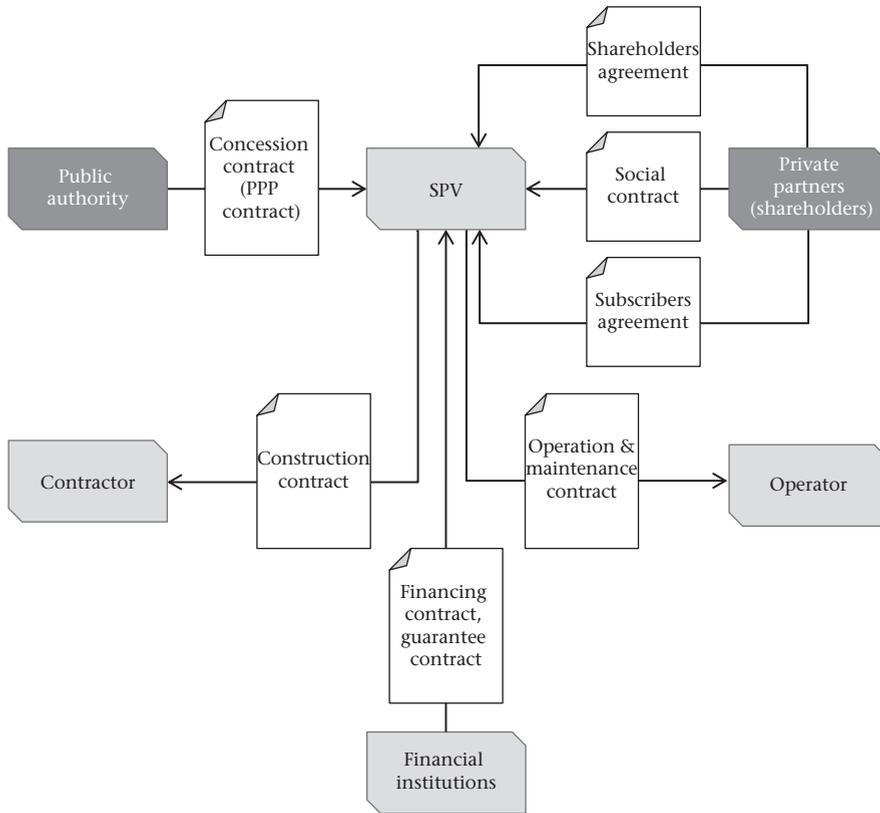


Figure 6.2. Typical contractual structure of a concession, the most common model of contractual PPP

governance. In theory, the mixed company model would allow the devising of a relational agreement capable of coping with unforeseen or unexpected events without the need for costly renegotiations. Moreover, the idea is that the public partner carries out internal regulation with much better access to information. However, evidence shows that the fragilities of the model constrain the theoretical positive outcomes and often result in the poor protection of the public interest (for details on these arrangements, see da Cruz and Marques 2012b).

Occasionally, public authorities engage with private actors in initiatives that are not framed in the two models described above and outlined in Figures 6.2 and 6.3. This third type of PPPs may be referred to as collaborative PPPs. These initiatives correspond to either 1) development projects from which both public and private partners can extract benefits, in other words since the objectives of all parties are naturally aligned, there is no need for formal contractual incentives; or 2) projects championed and financed by the public authority, with input from both for-profit and non-profit players actively sought, in other

Carlos Oliveira Cruz, Nuno F. da Cruz

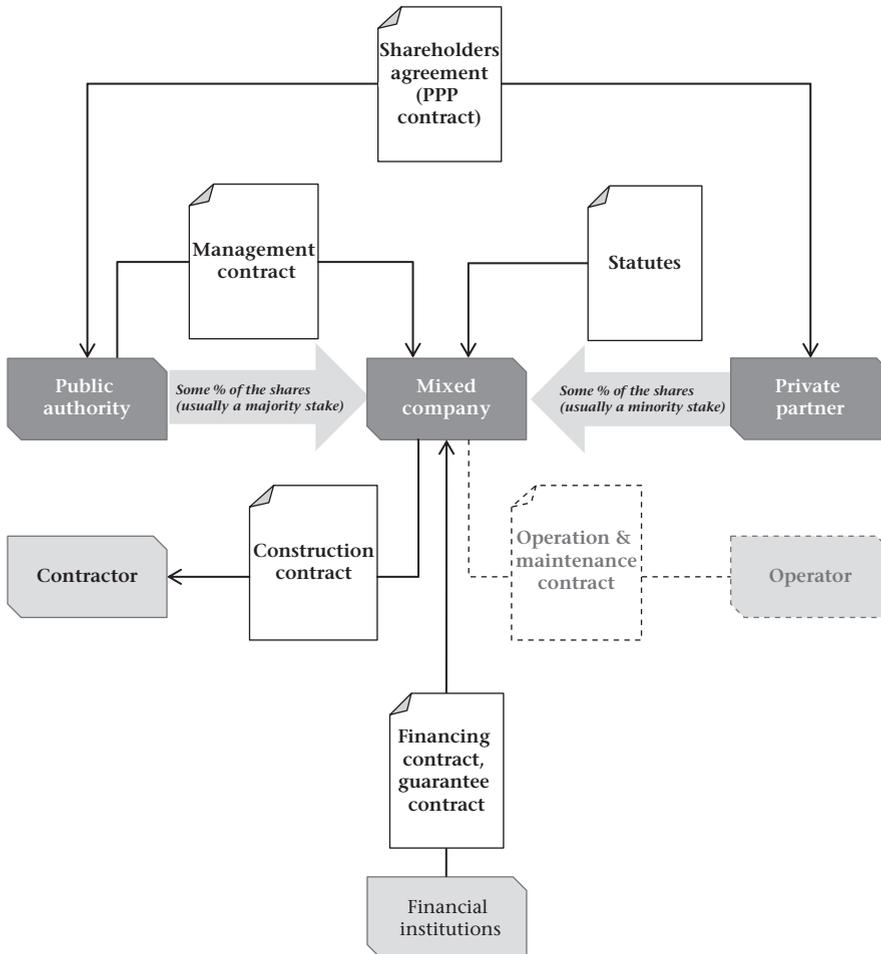


Figure 6.3. Typical contractual structure of an institutionalised PPP

words, the opinions of these players are regarded as important for the success of those publicly led initiatives. Common examples include land development and urban regeneration projects. Instead of contracts, these collaborations are often framed by protocols. Among other technicalities, the absence of sunk investments on non-tradable assets and of transfer of risks to private actors are key aspects that do not conform to the PPP concept as it is defined above.

Economic rationale

Even though the topic of PPPs warrants discussions around wider political economy, agency, and behavioural and institutional issues, in order to

Public–Private Partnership

understand the concept of PPP it is fundamental to grasp the economic motivations behind the model. Project finance leveraged in debt and equity from the private sector is more expensive than traditional public financing. Private debt or equity requires a higher return than risk-free debt, for example public debt or bonds, given the need to charge a risk premium.

So, if financing through PPPs is substantially more expensive, why even consider adopting the model? The answer to this question lies within the economics of PPPs. The economics of PPPs are built upon a generalised assumption of achieving cheaper infrastructure, quicker delivery, and/or better quality of service—or in reality, an efficient trade-off between these often conflicting objectives—due to three main intrinsic characteristics: adopting a whole life cycle approach, better control over time and cost, and more efficient private management.

Technically, the integration of several stages of an infrastructure project, such as design, construction, and maintenance, should allow for achieving lower life cycle costs. The rationale behind this is fairly simple. Traditional public work contracts are focused on decreasing the cost of construction, which may not minimise total life cycle costs. For example, an increase in cost during construction due to using costlier but also more durable materials may result in even higher savings during the maintenance phase. The bundling of stages provides an incentive to rationalise costs, thus decreasing the overall cost of infrastructure provision during the entire life cycle. The focus of the project managers is no longer to minimise the CAPEX⁹ but rather to minimise the TOTEX.¹⁰ In a typical PPP scheme, for example a BOT concession, in addition to optimisation of the TOTEX, there is assurance for the contracting entity that, given a proper competitive environment, the potential private partners will cover all available technology and best practices in their bids, thus increasing the probability of finding an optimal solution.

Construction cost and time overruns have long been critical issues for engineering and technical designers as well as planners in the public sector, and there is unquestionably a general tendency towards skewed frequency distributions, in that overruns are extremely common and often very lengthy and costly, whereas timely and on-budget completions are very rare. There are several reasons to explain the bias towards cost overruns in public infrastructure projects, most of them related to the complexity of projects such as airports, dams, bridges, and ports and also due to the dynamic economic

⁹ CAPEX is the capital expenditure, that is the cost of acquiring, building, and/or improving a long-term physical asset.

¹⁰ TOTEX is the sum of all capital expenditure: the asset, a subsystem, or a component, including the acquisition cost, the operating costs, and the residual value if negative, for example dismantling or disposal.

Carlos Oliveira Cruz, Nuno F. da Cruz

and political contexts in which these projects are planned and designed (Flyvbjerg, Skamris Holm, and Buhl 2003; Anziger and Kostka and Sovacool, et al. in this volume).

Finally, the perhaps less technical feature is also the most contentious. Indeed, one of the main normative beliefs behind the PPP alternative is that the private sector is more efficient, in other words capable of producing more outputs with fewer inputs, than the public sector in delivering infrastructure services. The rationale for this argument of higher private sector efficiency is associated with the competition to access the market. Demsetz (1968) defined the processes of competition for the market and competition in the market. Most infrastructure PPPs are focused essentially on competition for the market, given that the object of a PPP is usually a natural monopoly and therefore immune to ex-post competition. The effect of this ex-ante competition, however, can only be achieved and retained through a regulatory model that removes barriers to entry, enforces efficiency, and fosters the incumbent to continuously improve its performance, hence avoiding a rent-seeking attitude where contract drafting and management are key. The not exclusive but certainly important function of the regulator is to replace the competition in the market.

Optimal risk allocation and value for money maximisation

Another indispensable aspect in any discussion of PPPs is risk analysis and risk sharing. In this case, risk should be regarded as any present or future action or event capable of influencing a project's forecasted variables, especially costs or revenues, either negatively, in terms of downside risks, or positively, in terms of upside risks. Risk analysis for a PPP arrangement is generally structured around a risk matrix, which should contain at least two key elements: an exhaustive identification of the risks involved and a clear allocation of those risks, that is whether a given risk is a public, private, or shared responsibility. A third element is also desirable: a quantitative or qualitative evaluation of risks that predicts the likelihood and project impacts of each risk and suggests actions to prevent or mitigate the risks.

The allocation of risk is not a straightforward task. Principal-agent theory indicates that each risk should be allocated to the agent best suited to control or influence it (Jensen and Meckling 1976). Furthermore, the more risk assumed by a private partner, the higher the risk premium. This means that the private sector is able to assume some level of risk but will demand remuneration in exchange for coping with it. Transferring all risks to the private sector might therefore not be the best solution, since there are risks, for instance legal risks, that the private sector is not properly equipped to manage.

Public–Private Partnership

Forcing the private sector to accept all risks may result in an extremely high risk premium, jeopardising the potential value for money of a PPP.¹¹

In sum, it is essential to ensure an effective risk allocation that avoids a moral hazard problem, which occurs when a private partner assumes risks on paper but, because of contractual clauses detailing exceptions that shift risk back to the public sector, does not actually have to take on the costs of such risks in the event that they materialise during a project. Information asymmetry is once again at the root of economic theory's explanation for the moral hazard problem (Arrow 1971). Private partners are often large multinational firms or operators with many years of experience and projects in several jurisdictions. Because they are involved in the daily management and delivery of projects, they hold privileged information about business and operational activities when compared to the public sector entities.

Facing reality

Understanding the concepts, approaches, and rationales behind PPPs, we now turn to empirical evidence regarding their performance and outcomes in infrastructure in order to determine whether expectations tend to meet reality.

Cost of financing

As discussed in the previous section, a higher cost of capital for private financing is an expected feature of PPPs. However, empirical evidence suggests that the expected savings from other theoretical features of PPPs consistently fail to outweigh these higher financing costs.

Shaoul, Stafford, and Stapleton (2006) analysed eight concession contracts in the road sector in the UK and found an after-tax return on capital of 29 per cent and a cost of capital of 11 per cent, versus a cost of capital of 4.5 per cent for public finance—what the authors claim to be 'highway robbery'. In a similar study, Acerete et al. (2010) examined Spanish road concessions and found that after nine years, accumulated costs had surpassed original construction costs: the actual cost of the concessions was higher than the initial forecasted investment for construction and maintenance. A similar conclusion was reached by Fernandes, Ferreira, and Moura (2016), who analysed seven Portuguese shadow toll road concessions. In this case, the authors estimated that the interest paid to lenders and shareholders represented around 28 per cent of the total shadow tolls paid by the government, a

¹¹ Value for money can be understood as a measure of utility in public spending. Value for money tests are based on the estimation of the expected life cycle costs of a public delivery model.

Carlos Oliveira Cruz, Nuno F. da Cruz

value similar to the entire construction cost—31 per cent of the total shadow tolls—and more than double the operating cost, at 15 per cent. The overall conclusion is that the cost of financing PPPs is excessively high, consuming vast resources from citizens/users and governments.

Efficiency and on-budget and on-time performance

There are several empirical examples of the superiority of private over public management of infrastructure services. For example, in the water sector, private management has been associated with more effective reductions in water losses (Andrés et al. 2008) of both technical, such as pipe leaks, and commercial, such as illegal connections, natures (Gassner, Popov, and Pushak 2009). It should be noted, however, that gains in efficiency are often associated with employee layoffs: in Latin America, 20 to 65 per cent of employees were laid off after privatisation (Marin 2012). Even in the transport sector, there is evidence of highly intense labour use by private companies, sometimes leading to a 42 per cent lower average cost per vehicle-kilometre, as reported in an analysis of the Spanish transport market (De Rus and Nombela 1997).

Already some time ago, empirical evidence suggested that PPP schemes could provide better cost and time performance during construction (Flyvbjerg, Skamris Holm, and Buhl 2003, 2004; Grimsey and Lewis 2002). More recently, some authors have focused their research on comparing performance regarding construction costs (Raisbeck, Duffield, and Xu 2010), while others have focused on time performance (Hampton, Baldwin, and Holt 2012), but the conclusions are consistent. It is important to note that for the public sector, in terms of financial burden, a PPP is similar to a price cap construction contract for the TOTEX, all else being equal. The problem arises when the context, particularly regarding policies, changes, leading to inevitable and very expensive renegotiations. In fact, PPP contracts often contain triggers that deploy renegotiation if certain expectations do not materialise or if certain variables fluctuate beyond a specific threshold. The renegotiation process occurs without competitive pressure from other bidders, which makes prices detach from true costs, and often in an environment of significant asymmetric information in which the private incumbent is equipped with more and better information than the public partner.

Contract incompleteness and renegotiations

Renegotiations take place when an existing contract is no longer suitable to regulate the relationship between partners and does not truly conform to reality. In some way, renegotiations can be a measure of success in the sense that the need to resort to renegotiation indicates a contract failure. Such

Public–Private Partnership

contract failure and the need for renegotiations are the result of the unavoidable incompleteness of long-term agreements. Concerning the incomplete nature of contracts, Tirole (1986) claimed that the impossibility of foreseeing all possible contingencies and circumstances should make agents aware of the potential for future renegotiations. Even earlier, Williamson (1976) asserted that the franchising of natural monopolies may suffer from what were then designated ‘contractual disabilities’. The merit of contractual regulation, as in the case of PPPs, over ‘institutional regulation’ undertaken by external regulators is to avoid the discretionary behaviour of regulators (Gómez-Ibáñez 2003). But the empirical evidence around renegotiations and particularly their negative outcomes for the public interest has raised several critiques and concerns about the real-world use of the PPP model. The incomplete nature of contracts assumes a particular relevance in PPPs given their duration, the investment outlays involved, and the essential nature of the services in question. Over the course of thirty or forty years, social, political, and economic backgrounds will very likely change significantly, which in turn makes contracts more vulnerable to incompleteness.

In theory, renegotiations per se are not necessarily negative for the public interest. Given the long-term nature of a PPP relationship and the bounded rationality that affects the drafting of the original contract, when partners face new circumstances or events during the execution of a contract, it might be beneficial for both agents to discuss and rearrange the terms of the partnership in order to accommodate those changes. Potentially, this could allow the partners to mutually mitigate unwelcome effects, that is downside risk, or reap the benefits of new opportunities, that is upside risk (da Cruz and Marques 2012a). The unavoidable but controlled losses or the seized and originally unexpected gains could then be shared by the partners, depending on the risk matrix agreed upon beforehand.

The problem is that reality usually turns out quite differently. There is burgeoning empirical evidence of a systematic bias towards harmful disadvantages for the public sector (Cruz and Marques 2014; Guasch 2004; Sarmiento and Renneboog 2014). Guasch (2004) found that over 50 per cent of PPP contract renegotiations in Latin America had one of more of the following outcomes: delays in investment, tariff increases, increase in costs with automatic pass-through to tariff increases, and reduction of investment obligations. In all of these cases, the results of the renegotiation had a major negative impact for the public interest.

There are several reasons for this. First, most renegotiations occur in response to unilateral decisions that have been undertaken by the public partner and that negatively impact the PPP agreement by changing, for instance, the scope of the concession, the investment plan, or the legal and regulatory framework. Given these new changes and requirements deployed

Carlos Oliveira Cruz, Nuno F. da Cruz

by the governmental authority, a private partner then requests renegotiation of a contract. Second, renegotiations occur in a non-competitive and unbalanced environment where a private partner holds more and better information. Even with the strong involvement of the public authority in monitoring and controlling a project, a private partner will always retain more know-how and data regarding the project or service because it is in charge of delivery.¹² And in fact, public authorities are usually not that committed to effective contract monitoring and management. This third factor—poor managerial capacity of the public sector—is the result of two drivers. First, the public authority generally employs significant resources in a PPP process until contract signature, after which there is a typical alienation towards the project, in that there is a sense of delegation of responsibilities.¹³ Second, growing budgetary constraints and the outsourcing of governmental functions decrease the public sector's capacity.

Given the generally negative public interest outcome of renegotiations, the problem becomes a massive one considering the frequency with which renegotiations tend to occur. A good example of this situation is Portugal, which has been very enthusiastic in developing PPPs in a range of sectors since the early 1990s and which today is burdened with active PPPs accounting for over 1 per cent of GDP annually and €25 billion in gross payment responsibilities until 2050 (only central government PPPs) (Cruz and Marques 2013). As shown in Figure 6.4, which presents an overview of 112 renegotiation processes that occurred between 1995 and 2012 in Portugal in several sectors, the percentage of contracts renegotiated is very high—100 per cent for roads, railways, and water systems. Moreover, first renegotiations tend to happen extremely early on in the contracts: most concession contracts have durations of twenty, thirty or forty years, and the majority of renegotiations took place within the first five years. Finally, another alarming result is that the same contract is frequently renegotiated. Indeed, the consequences and likelihood of renegotiation represent a major weakness of the PPP framework.

¹² In institutionalised PPPs, the information asymmetry problem may not be so accentuated because the public partner is also involved in day-to-day management. However, this creates a situation in which the public authority acts as an operator and a regulator simultaneously, which at times may generate conflicts of interest. Indeed, as discussed in da Cruz and Marques (2012b) the problems with mixed companies are slightly different from the problems with the more common purely contractual PPPs.

¹³ Nevertheless, the ultimate responsibility for making essential public infrastructure services available to the population will always lie with the public authorities. Irrespective of the producer, which may be private, the provider is the competent public authority. From a citizen's perspective, the ownership or governance model of the producer is not relevant. That is, the public authority actually delegates tasks, not responsibilities.

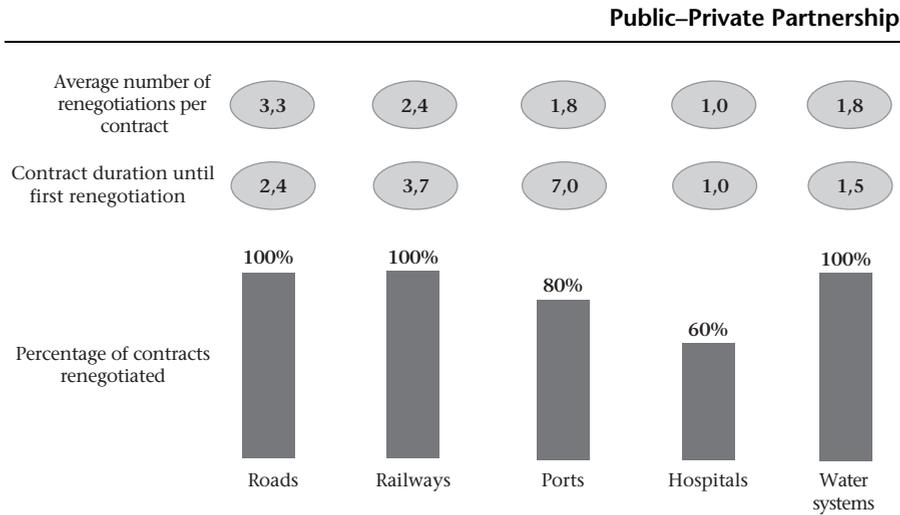


Figure 6.4. Renegotiations in 112 Portuguese PPPs between 1995 and 2012

The road ahead for PPPs

The global experience with PPP arrangements has been largely trial-and-error, with expensive lessons for governments, citizens/users, and much more rarely, private partners. The underlying economic principle of PPPs is achieving higher value for money, in other words better services at lower costs. But the complexity and liabilities inherent to the model have often eroded any advantages of bringing competitive market pressure to public infrastructure sectors. The PPP model has, simultaneously, fierce advocates and fierce critics, but the latter group have not been able to provide feasible alternatives to finance public infrastructure without private involvement, or realistic alternatives to use private financing in entirely different arrangements. The trend therefore has been to incrementally build upon and improve existing PPP models.

It is unlikely that the recourse to private financing will decrease any time in the near future. While infrastructure assets continue to deteriorate and maintenance deficits persist in developed economies, there is a growing search for maximising efficiency and productivity in public services and infrastructure. Often the neoliberal assumption that private management is better suited to accomplish these objectives still prevails. Furthermore, a crucial driver for the growth of PPPs has been the fact that the main financiers promote the use of this procurement model. Development banks, multilateral agencies, sovereign funds, and bilateral governmental financing agreements have all promoted the use of PPPs for infrastructure development, and in most cases, financing is even conditional on heavy private sector involvement in the project. Development banks are actively supporting building government capacity to create a fertile basis for private sector growth and participation in public

Carlos Oliveira Cruz, Nuno F. da Cruz

infrastructure delivery. This occurs not only in emerging countries but also in advanced economies. The bailouts of Greece, Ireland, and Portugal are recent examples of financial aid conditioned to a reform programme with an overall strategy of opening infrastructure services to a greater private sector participation in the form of PPPs or full privatisations.

Nevertheless, the use of the PPP model is at a crossroads. The documented failures of the past use of PPPs—particularly concerning renegotiations, their harmful results, and the excessive capital costs—have led policy-makers to seek out new models for partnering. An example currently gaining momentum is the non-profit distribution (NPD) scheme, developed in Scotland and worth £3.5 billion. Deriving from the well-known private finance initiative (PFI) model, the NPD scheme represented an innovative relationship model between the public and the private sectors (Hellowell and Pollock 2009). The main innovation of the NPD model is that it caps the level of returns and reinvests in non-profit activities any surplus that might arise from the development of a project. The search for these more collaborative models aims at coping with the idea that during contract execution, private partners can engage in opportunistic rent-seeking strategies and obtain large economic surpluses. This model also tries to prevent strategic behaviour, for example lowball bidding, in expectation of post-award gains after renegotiation. But other, more conservative alternatives are being considered to decrease capital costs, for example debt funding competition. Under this model, it is possible to achieve a lower capital cost. After the contract is signed, the private and public sector jointly search for the most favourable financing source(s).

The profile of projects is also changing. The literature suggests that projects are evolving towards high-value transactions, in some cases bundling smaller-scale dispersed projects into a single large transaction, similar to the Pennsylvania Rapid Bridge Replacement Project in the USA or the Secondary School Building Modernisation Programme in Portugal (da Cruz and Marques 2012a). Governments are becoming more and more creative in extracting potential benefits from private sector expertise. For instance, in order to improve the selection mechanism of projects, countries such as Brazil are promoting market-led, unsolicited proposals. This model places on the private sector the responsibility or the initiative for analysing and selecting those projects with higher returns. However, although allowing for a first screening of financially viable projects, this model does not ensure a comprehensive analysis of infrastructure needs or the maximisation of social welfare.

In conclusion, the market for PPP development is growing, and so is the appetite of private financiers and governments. In 2014, the G20 launched the G20 Global Infrastructure Initiative, a multi-year programme to support public and private investment in quality infrastructure, acknowledging the need for structuring knowledge and know-how and helping governments to

Public–Private Partnership

successfully deliver needed infrastructure while engaging private financing. Success in the design and implementation of PPP projects depends on a myriad of factors, but one arises as most relevant for the years to come: building up trust between the public and private sectors. The pitfalls in the use of PPPs—particularly the costly renegotiations, rent-seeking strategies by private sector bidders, and unilateral changes by governments—have all converged to an environment where a lack of trust inevitably leads to higher risk premiums, more expensive projects, and ultimately inability to deliver projects successfully.

Building trust is required at different levels. At a strategic level, political commitment assumes a fundamental role in the good governance of infrastructure projects. Infrastructure projects are often used by the opposition as a political battleground against incumbent governments, transforming the process of infrastructure delivery into a long-lasting stop-and-go motion. At a tactical level, trust should be built by setting up proper institutional bodies in order to assure the steady and reputable governance of infrastructure delivery programmes that particularly aim at attracting relevant private sector interest and participation. At the operational level, trust is promoted through transparent, clear, and competitive tenders; well-informed decisions based on cost–benefit analysis, value for money tests, and robust forecasts, among other tools; and also in a flexible contract design able to cope with rapidly changing environments or requirements. It is unrealistic to expect that such long-term contracts can be complete. The contractual framework can, however, be equipped to deal with this inherent incompleteness, providing the proper mechanisms to regulate and manage contractual changes. The existence of a mature economic, political, and regulatory environment is a requisite for engaging the private sector in infrastructure delivery and infrastructure governance at a fair cost while providing value for money.

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