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Public-Private Partnerships
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in Infrastructure

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PUBLIC-PRIVATE PARTNERSHIPS AND INVESTMENT IN INFRASTRUCTURE

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By Sónia Araújo and Douglas Sutherland

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ABSTRACT / RÉSUMÉ

Public-private partnerships and investment in infrastructure

How can governments reap the potential benefits of public-private partnerships (PPPs) in the provision of infrastructure? Private sector involvement in the provision of public goods is long-standing, often relying on franchises or concessions. More recently, PPPs have risen in prominence, promising innovative solutions and a better allocation of inputs than traditional procurement with separate concessions. However PPPs are not without risks with the outcome depending on the identification of the most efficient bidder, the risk sharing between the public and private sector and the design of the contractual relationship. Furthermore, PPPs, particularly when they are used to circumvent budgetary constraints, present risks to government budgets by creating large contingent liabilities. Drawing on a discussion of the economics of PPPs in relation to infrastructure and questionnaire responses, synthetic indicators are used to assess how well-suited policy frameworks in the OECD are to benefit from PPPs. The results show marked heterogeneity across countries, suggesting there is scope to improve performance and gain expertise by considering other countries' experiences.

JEL Codes: D23; H41; L33

Keywords: public-private partnerships; public goods; incomplete contracts; investment incentives

Partenariats public-privé et investissement en infrastructures

Comment le secteur public peut-il tirer parti des avantages éventuels des partenariats public-privé (PPP), s'agissant de la mise à disposition d'infrastructures ? Le secteur privé intervient de longue date dans l'offre de biens publics, souvent dans le cadre de concessions. Plus récemment, les PPP ont gagné en importance, présageant de solutions novatrices et d'une affectation des ressources plus efficace que celle de la passation de marchés classique basée sur des concessions distinctes. Mais les PPP ne sont pas dénués de risques, leur résultat étant tributaire de la sélection du soumissionnaire le plus efficace, du partage des risques entre secteurs public et privé, ainsi que du montage contractuel retenu. De plus, surtout si l'on y fait appel pour échapper à des contraintes budgétaires, ils entraînent des risques pour les budgets publics parce qu'ils génèrent d'importants passifs éventuels. Des indicateurs synthétiques, établis à partir d'une analyse des aspects économiques des PPP dans le domaine des infrastructures et des réponses à un questionnaire, sont utilisés pour évaluer dans quelle mesure les cadres d'action des pays de l'OCDE sont adaptés pour exploiter les avantages des PPP. Il en ressort une forte hétérogénéité internationale, qui laisse entrevoir des possibilités d'améliorer les résultats et d'acquérir des connaissances en étudiant les expériences des autres pays.

Codes JEL : D23; H41; L33

Mots-clés : partenariats public-privé ; biens publics ; contrats incomplets ; incitations à l'investissement

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PUBLIC-PRIVATE PARTNERSHIPS AND INVESTMENT IN INFRASTRUCTURE

By Sónia Araújo and Douglas Sutherland¹

1. Introduction

1. Private sector involvement in the delivery of public goods is a long established practice in OECD countries. In the recent decades, faced with growing pressures to expand and improve infrastructure quality as well as enhancing competitiveness and economic growth, OECD governments have increasingly turned to public-private partnerships (PPPs) to provide public infrastructure services. In turn, PPPs are attractive to the private sector as the investment is recovered either by government transfers and/or by charges applied to the users of the facility (*e.g.* tolls). By reaping the benefits of private sector participation (pursuit of innovative solutions and better allocation of inputs), PPPs can be a superior solution to traditional public procurement, providing greater value for money.

2. However, opting to deliver infrastructure services through PPPs is not without risks. First, the benefits of private sector participation are not guaranteed in a PPP. The outcome will depend on several factors, ranging from correct identification of the most efficient bidder, to appropriate risk sharing and the contractual relationship established between the public and private partners. Secondly, and perhaps more importantly, the temptation to use PPPs as a mean to circumvent budgetary pressures can lead to the inappropriate use of PPPs. Furthermore, by not including investment undertaken by means of a PPP in the public budget, large contingent liabilities can affect long-term fiscal and macroeconomic sustainability as well as transfer the burden to future generations.

3. Policymakers need to analyse the merits of delivering infrastructure services through PPPs carefully, taking into account the specificity of the asset under consideration. Before deciding to deliver infrastructure by using a PPP, a careful evaluation of its fiscal implications should be pursued together with a proper assessment of its merits *vis-à-vis* traditional procurement. Additionally, government bodies and agencies should ensure they select the most efficient bidder and that the contract structure effectively and properly allocates risks to the parties better equipped to deal with them. Finally, a stable institutional environment needs to be in place so that the public sector is regarded as a credible partner at the eyes of the private sector. The public sector should also build a pool of in house knowledge and expertise that is able to successfully manage and monitor PPP contracts and assist the different public bodies throughout the contracting process to guarantee that value for money is indeed achieved.

4. This paper provides an overview of the issues that are relevant for PPP contracting in network sectors². Section 2 highlights the distinctive features of PPP arrangements relative to other alternative

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mechanisms of delivering public infrastructure. This section also discusses the advantages and potential pitfalls of PPPs and presents an overview of how they have been used in OECD countries. Section 3 provides guidelines to ensure that the benefits of private sector participation are reaped and good quality of service provision is achieved. Section 4 presents a quantitative indicator on PPP frameworks that attempts to measure to what extent the existing features of PPPs in place in OECD countries enable governments to extract the benefits sought in a PPP. The indicator also allows to highlight the dimensions that need to be improved to achieve efficiency in contracting PPPs. Section 5 concludes.

2. The economics of public-private partnerships

2.1 PPPs: a specific form of private sector participation

5. A PPP agreement is defined as a long-term contractual relationship between a public body and a private partner (or a consortium of private firms) for the construction and operation of infrastructure. The private partner will be in charge of building, managing and asset maintenance, service provision and for financing the investment, in exchange of regular payments by the government and/or user charges. Under a PPP scheme the asset is typically owned by the private sector, but there are usually provisions in the contract for its legal property to be transferred to the public sector at the end of the contract. There are several variations to this basic definition, depending on the allocation of different risks between the public and the private partners, but almost all PPPs include both the building and the operation of a facility.³

2.1.1. Differences between PPPs and alternative approaches to infrastructure service delivery

6. PPPs are sometimes seen as occupying the middle ground between full public provision, where the asset is built through public procurement and managed by the public sector, and full private provision. The public nature of the services to be delivered and concerns with social welfare justify that decisions regarding investment, management and provision of infrastructure services remain under the responsibility the public sector.

7. Like PPPs, concessions make use of the private sector to achieve value for money. Unlike PPP contracts, the asset remains property of the public sector throughout the length of the contract. The concessionaire operates and finances the maintenance of the asset, but is generally not involved in its construction. In fact, the nature of the concession contract is such that it is the private operator that pays the government for the right to operate the asset. User charges constitute the bulk of revenues and many concession contracts do not envisage any payment from the government. This implies that the level of demand risk transferred to the private sector is higher than the one transferred in a PPP contract. The underlying idea is that concessions are generally fully viable (because the asset is already put to use) while uncertain demand for a new infrastructure facility leads to PPPs often needing financing from the government (Andres and Guasch, 2008). Without the absence of these guarantees, the private partner bears all demand risk.

8. However, there are many overlapping issues between concessions and PPP contracting: the selection of the most efficient bidder and, given the necessary incomplete nature of these type of contracts, the design of mechanisms to (a) ensure an appropriate and effective transfer of risks and responsibilities to the private sector, (b) mitigate hold ups in investment throughout the life of the contract and (c) minimise

2. For the purpose of this paper, infrastructure network sectors comprise transportation (roads, bridges, highways, railroads, ports and airports), utilities services (energy and water) and telecommunications.

3. See IMF (2004) for a taxonomy of PPP agreements and OECD (2008) for a discussion and classification of the different types of risk entailed in a PPP contract.

the potential opportunistic behaviour from the private sector and avoid engaging in costly renegotiation at the expenses of the public sector.

9. A PPP contract implies greater participation of the private sector compared to traditional procurement as it transfers to the private sector both the construction and the operation of the asset, including its maintenance.⁴ Under a PPP contract the private sector is also responsible for financing the infrastructure investment. PPP contracts are set over lengthier periods of time, compared to the ones signed under traditionally procurement, in force only for the time necessary to build the infrastructure asset. Lengthier contractual relationships call for contractual flexibility under a PPP, as output specifications and service standards will possibly become obsolete during the life of the contract. Long term contracts raise new issues, such as the need of ensuring an optimal level of investment throughout the contract, and dealing with contract re-negotiation and the possibility of opportunistic behaviour. These issues are also present in franchises, given the long term nature of these contracts.

2.1.2. Rationale for private sector participation

10. The advantages sought from the private sector in infrastructure provision stem from the fact that it allows more efficient outcomes to be achieved, by incorporating in the infrastructure project the private sector know-how and technical expertise to provide innovative approaches and managerial abilities to coordinate the several stages entailed in a PPP: finance, design, build, operation and maintenance of an infrastructure facility. A PPP, in contrast to public procurement, bundles the construction and the operation phases, thereby creating incentives for the private contractor to internalise operational and maintenance costs on its investment decisions during the construction phase (Hart, 2003). The private partner will then seek to identify the design and construction options that can potentially minimise the costs of construction and provide better service quality.

11. There are a number of reasons for seeking the involvement of the private sector in the provision of infrastructure investment. They include:

- *Financial expertise.* Outside finance will bring in financial expertise that can contribute to a better evaluation of the risks entailed by a project and better monitoring of the private operator's efforts.
- *Sharing risk.* The involvement of the private sector can also lead to better risk management. The private sector will likely have a better appreciation of the risks involved in a project, both due to superior project management expertise and the frequent requirement of exerting due diligence before embarking on a project. The risks attached to an investment can in principle be shared between private operators and the State, with each bearing the type of risks – and associated incentives – for which they are most suited. Generally, risk that is difficult to control or forecast should not be borne by the contractor, which is often the case for demand side risk. In some cases, governments have assumed this risk, by subsidising the contractor if demand falls below a certain level. Instead, construction risk and availability risk are more appropriately borne by the private sector.

4. Traditional procurement corresponds to a situation where the construction and the operation phases are “unbundled”: the public sector contracts a builder to construct a facility, while keeping the responsibility of delivering the services. Under public procurement, the government retains all responsibilities (risks) related to the project.

- *Introducing competitive pressures.* Tendering introduces an element of competition *ex-ante*, for the market (Demsetz, 1968). The introduction of competitive pressures *ex-ante* is also present in traditional procured infrastructure delivery.
- *Budgetary pressures.* Finally, there may be an interest in using PPPs to disguise pressure on public finances. However, in such cases, investment decisions – by precluding appropriate alternative investment arrangements – will lead to suboptimal outcomes.⁵ This suggests that the approach to using PPPs must rely on a proper and transparent assessment of their expected long term impact on public finances (OECD, 2008). A stark example occurred in Hungary with major PPPs for motorways recorded off budget in 2005 and 2006, despite the partnership involving a state-owned enterprise. Eurostat ruled in 2006 that these expenditures needed to be reported, which boosted the deficit by almost a full percentage point of GDP in that year.

2.2 *Specific features of PPP arrangements*

2.2.1 *Bundling: benefits and caveats*

12. The particular attraction of the PPP concept relies on bundling the asset construction and operational phases, so that they are undertaken by the same agent (the contractor, a firm or a consortium). Bundling construction and asset management induces the private partner to consider the asset's long term performance, that is, to take a "whole life asset management" approach. Compared with traditional procurement, quality concerns can be better addressed under PPPs if high quality infrastructure reduces operational and maintenance costs. In this case, the contractor internalises these costs and, when deciding construction options, chooses a level of quality that minimises all operational, maintenance and construction costs. This positive externality between quality and operational costs provides incentives for the contractor to invest in asset quality.⁶ Bundling then constitutes an optimal strategy from the point of view of the public sector, as it raises welfare by inducing the private partner to exert effort on construction quality.⁷ In case of a positive externality, the optimal contract should lean towards high powered incentives, to encourage the contractor to internalise the benefits of bundling.

13. When the externality is negative (*i.e.* improving the quality of infrastructure increases operational costs), the effects on incentives are negative or absent. In this case, PPPs will not be superior to traditional procurement, as the investor will just pursue cost saving investments, not caring about service provision, just as in the procurement case. The solution to enhance effort in quality is to grant the contractor ownership of the asset. Ownership rights will allow the builder to benefit from the infrastructure's residual value at the end of the contract, providing an incentive to invest in asset quality.⁸ The residual value will depend on the specificity of the asset. More generic facilities (such as leisure centres and public housing), for which there is demand other than the government, are more valuable as an outside option than specific facilities who have limited use outside the public sector (prisons, hospitals,

5. This remains the case when PPPs are used to circumvent fiscal rules that constrain government investment, which may be justified when taking into account longer time horizons (Blanchard and Giavazzi, 2004).

6. For example, Winston (1991) reports that small increases in pavement thickness can dramatically lengthen the life of the pavement and reduce maintenance costs.

7. This is a strong result of the theoretical literature that arises in both complete and incomplete contract scenarios. The complete contract theory focuses on the asymmetric information between the public and private sector, where the public sector cannot observe the level of effort of the contractor, while the incomplete contract theory focuses on the impossibility of making the contract contingent on the level of quality. See Hart *et al.* (1997), Hart (2003), Martimort and Pouyet (2008) and Iossa and Martimort (2008).

8. See Besley and Ghatak (2001).

schools). Hence, the incentives to invest are greater when the private partner has the ownership of the asset and the asset is less specific.

2.2.2. Risk allocation

14. Risks in PPP projects need to be appropriately and effectively shared between the public and the private partners so they achieve cost savings and quality improvements *vis-à-vis* traditional procurement. The optimal allocation is the one that assigns each risk to the party that can better manage it. More specifically, the government should keep hold of the risks that the private sector cannot control, or affect. Given this rule, **construction risk** is generally best borne by the contractor.

15. Effective allocation of **demand risk** is crucial to achieve good quality of service provision and the same reasoning should also apply to deciding which party should bear it. Demand risk allocation will then depend on the relationship between the payment and the actual use of the infrastructure facility. Demand risk should stay with the government⁹ when it is the buyer of the services provided by the private sector and its actions and policies affect demand level (such as in the case of schools and prisons). Investment should then be financed through a transfer from the government to the private operator. Conversely, if the builder's actions have an impact on demand (*e.g.* road quality or cost), transferring the risk to the contractor helps incentives. In this case, investment should be financed through user fees (financially free standing PPPs). However, these high powered incentives should only be used when risk aversion and demand risk is small. Financially free standing projects can result in excessive risk transfer and the public sector may have to intervene later on, through costly renegotiation and transfer payments to the private operator. When risk aversion or demand uncertainty is large, the optimal contract is characterised by a minimum revenue guarantee (which is independent of the actual usage of the facility), and a cap on the contractor's revenues (Engel *et al*, 2006).

16. In practice, even if the contract transfers design, construction and operation risk to the private partner, the government remains the provider of last resort, given its interest in guaranteeing service provision. For instance, in case of a cost overrun, private contractors will exploit public interest considerations, forcing the government to intervene to minimise service disruption. Moreover, re-tendering a PPP contract implies a long and costly process as well. Hence, when it comes to risk allocation, it may well be the case that the allocation of risks written down in the contracts does not correspond to the effective risk allocation. In this respect, it is crucial to carefully assess demand risk prior to calls for tender being made. Examples of poor PPP performance related to demand risk in the OECD include:

- The Fertagus suburban rail passenger service. The initial contract formally transferred demand risk to the concessionaire, but established that the government would assume the debt if traffic remained below the lower traffic-band level for several years. This event materialised, and contract renegotiation took place, with the government being in a relatively weak position (Monteiro, 2008). The Portuguese Court of Auditors now recommends against transferring the demand risk to the private sector.
- The Channel Tunnel Rail Link. In February 1996 the UK Department of Transport awarded the contract to London & Continental Railways Limited (LCR). LCR planned to fund the construction of the Link by raising private finance on the back of future revenues from Eurostar UK and direct grants from the government. However, demand for the Eurostar train service ran

9. For the purpose of this paper, the term "government" is used in a broad sense, and encompasses all public bodies that are allowed to contract PPPs.

well below LCR's forecasts and the company was forced to abandon its plans to raise private finance and requested the government additional grants.¹⁰

- Highway projects in the Czech Republic, Croatia, Hungary and Poland. Besides unrealistic demand projections, other factors such as the unfavourable institutional environment during the transition period and suboptimal project design also contributed to the poor outcomes (Brench *et al*, 2005).

2.2.3. Long term contracting

17. To attract private sector participation, PPP contracts typically span for a few decades to guarantee a sufficient stream of revenues that will compensate the private partner for the investment made. But long term contracting poses a new set of challenges that need to be dealt with in order to guarantee the benefits of private sector participation. These are: the suitability of long term contracts to sectors where demand or supply conditions change rapidly in ways that cannot be foreseen and several hold up problems motivated by the incomplete nature of long term contracts, which may lead to opportunistic behaviour and underinvestment.

18. ***Long term contracts are unsuitable for sectors where users' needs or technology change fast.*** Given the long-term nature of PPP contracts, the contractual relationship between the public and the private partner needs to be flexible. When it is possible to anticipate the conditions that may affect the adequacy of the initial contractual clauses (*e.g.* changes in capacity), these should be regulated by the initial contract. However, long term contracts do not favour the introduction of innovations in service provision as changes are costly to renegotiate. This caveat can be partially offset by specifying in the contract the events that may justify a revision of the contractual clauses. In practice, it is not always possible to identify all possible events that may affect the suitability of the contract to changes in the economic environment, such as unpredicted shifts in demand preferences regarding service provision and fast and unpredicted course of technical progress. The IT sector is probably the sector more exposed to unpredicted changes in supply conditions while prisons, schools and the health sector have been identified as the sectors more exposed to unforeseen changes in demand conditions.¹¹ Conversely, they are more appropriate for transportation and water, where infrastructure quality is central to good service delivery and demand is relatively stable.

19. Long term PPP contracts increase uncertainty when compared with short lived traditional procurement contracts. This increase in the risk in the contractual relationship stems from the incomplete nature of long term contracts, which make it impossible and/or extremely costly to identify all possible courses of events and assign to each a contract rule. This situation gives rise to several hold-up problems.

10. The Channel Tunnel Rail Link constitutes an example of the difficulties involved in forecasting demand. After bailing out the private contractor, the Transport Department revised downwards passenger numbers and revenue forecasts in 1998 and again in 2000. However, by 2004 both figures were still below the 2001 low case projections. The forecasts conducted in 2004 predict that annual revenues will remain below the 2001 low case scenario until about 2050 (NAO, 2005).

11. In the United Kingdom, two large projects - the National Insurance Recording System 2 and the Passport Office were very public failures of large ICT-related PPPs. The HM Treasury now recommends against the use of PPPs in IT projects (HM Treasury, 2006). The UK is the only country that has used PPPs in the telecom sector, but none has been signed since 2000 (Dealogic Projectware Database).

20. ***Opportunistic behaviour of the contract winner.*** Following the bidding stage, the contract winner may re-open negotiations over the terms of the contract to force a more favourable structure.¹² This can arise with major infrastructure projects when the private contractor threatens insolvency or potential service interruption, often leaving the government little alternative to reopening negotiations. New contracting techniques can attempt to mitigate opportunistic behaviour, by specifying allowable debt, penalties and conditions to re-open negotiations. Nevertheless, the incentive to exploit the government's weak position given the alternative of long and costly re-tendering and its interest in guaranteeing service provision does not vanish completely.

21. ***Regulatory uncertainty or opportunism: the threat of expropriation given the sunk costs of the investment.*** Regulatory opportunism refers to the risk of unilateral changes of the contractual clauses by the government. The long term nature of the contracts makes it more difficult for governments to pre-commit to future policy. This applies to situations of political uncertainty due to a possible change in government attitudes towards conducting infrastructure investment through PPPs, brought by elections. For instance, Brench *et al.* (3005) report that, in Hungary, frequent changes in political attitudes regarding the desirability of PPPs have been identified as a major drawback for a coherent PPP policy.

22. Regulatory opportunism also applies to situations of weak governance in the public sector. Among the motives that can lead the government to cancel PPP contracts are electoral considerations in which the government, by cancelling the project, may increase the possibility of getting re-elected through increases in public spending, hence creating jobs and boosting economic activity, while also avoiding opposition surveillance (see Guasch, 2004 and Engel *et al.*, 2006). Environments characterised by high regulatory risk will not create incentives for investment in asset quality, as the private contractor will be confronted with the possibility of expropriation. Hence, PPPs are preferred in stable and sound institutional environments, where there is a consensus towards honouring contractual arrangements with the private sector. Otherwise, the benefits of whole-life asset management brought by PPPs cannot be reaped.

23. ***Capture.*** This situation occurs when the private operator seeks to influence a policy decision maker to favour bundling, even if this decision is not socially optimal. It is again a situation of weak governance, where a non benevolent decision maker is tempted by the potential private benefits he/she may earn by favouring private consortia's preferences towards PPPs, leading to outcomes where decisions are not aligned with welfare maximising concerns.¹³ In this case, as well as with regulatory opportunism, cost-plus contracts should be preferred (Martimort and Pouyet, 2008).

24. ***Under-investment.*** Increasing regulatory risk will discourage private investment, by raising the cost of capital and the risk premium paid for a PPP contract. The private operator will be reluctant to invest, as it fears that the benefits of the investment will be expropriated, once the costs of the investments are sunk. Additionally, a second hold-up problem will take place when the PPP contract is close to expire as the private partner expects not to enjoy fully the benefits of the investment (or not to be compensated by the government at the end of the contract). This situation will result in underinvestment in the later stages of the PPP contract. The problem can be mitigated if renewal is biased in favour of the incumbent (Laffont and Tirole, 1993), although in this case the competition benefits of private sector participation are lost. Another possible solution is to increase the incentives over time so to foster the firm's efforts to renew investment at later stages of the contract. This could be accomplished by switching from cost-plus

12. This is termed "hidden rent backloading" by Maskin and Tirole, (2007). Empirically, at least in Latin America, this appears to be a common form of hold-up (Engel *et al.* 2006).

13. This problem is similar to the one brought by regulatory capture. Stigler (1971), Posner (1971, 1974) and Peltzman (1976) were among the first to highlight the possibility that the regulator may not always be concerned with the interests of society as a whole. See Armstrong *et al.* (1998) for an overview.

contracts in early periods to fixed-price contracts close to the end of the contract, even though it may be suboptimal for rent extraction purposes (Laffont and Tirole, 1993).

25. Yet another solution is to create a setup in which the public and private sectors meet regularly and the public sector develops a reputation for being fair, by not expropriating the firm's investment. In these lines, Salant and Woroch (1992) suggest that, if capital can be spread over time, investment could be done in stages, with the cost of each stage being met as soon as it is completed.¹⁴ Conditional on past experience, either party can withdraw after each stage of the investment process.¹⁵ This approach may give incentives to provide higher quality investment without having to resort to detailed contract specification and it sidesteps to some extent the possible trade-off between shortening an often lengthy tendering process and engaging in costly contractual renegotiations if the contract is not well specified.

26. Finally, asset ownership can incentivise investment, especially in the case of generic facilities and if the firm is not required to give priority to the government at the end of the contract, thereby fully enjoying the asset's residual value. Finally, a note of caution: it should be noted that the underinvestment problem stems from the very own nature of PPP agreements and the characteristics of infrastructure assets, *i.e.*, that the government cannot commit *ex-ante* not to exploit the sunk nature of capital investments. Hence, the mechanisms suggested cannot fully tackle this problem, although they can alleviate it to some extent.

2.3 *Public-private partnerships in OECD countries*

27. The analysis in this section is based on an *ad hoc* OECD questionnaire on infrastructure investment and on data coming from the Dealogic Projectware database. OECD member countries' responses to the questionnaire provide detailed information on countries' policies on franchises and PPPs and the surrounding regulatory environment as of late 2007 or early 2008.¹⁶ In turn, the Dealogic Database provides a broad range of information on the use of public-private partnerships in OECD countries. In total, by the time data was extracted (19/02/2008), this database contained information on nearly 2 000 PPPs, covering: "The financing of long-term infrastructure, industrial projects and public services based upon a non-recourse or limited recourse financial infrastructure where project debt and equity used to finance the project are paid back from the cashflow generated by the project."

2.3.1. *Overview*

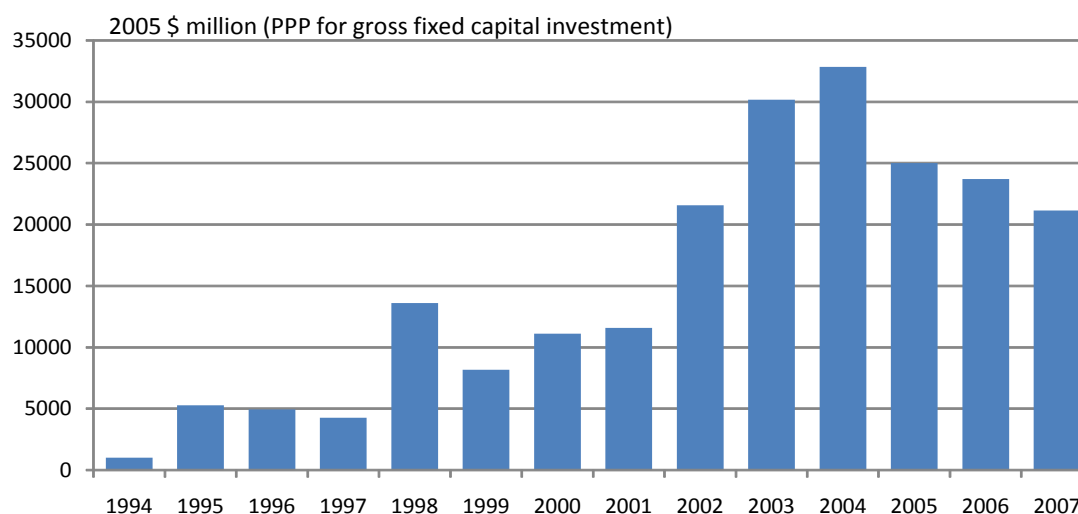
28. Over the two recent decades, PPPs have been gaining importance in many OECD countries as an alternative way to provide infrastructure (Figure 1). According to the answers given by OECD countries to the Infrastructure Questionnaire, central, regional and local governments, as well as governments agencies and public firms have the power to contract PPPs.

14. See also Gilbert and Newbery (1988), Croker and Reynolds (1989), and Salant and Woroch (1991).

15. This solution reflects some procurement practices in the United States, variously called Job Order Contracting, Delivery Order Contracting or Simplified Acquisition of Base Engineering Requirements (Pitchford and Snyder, 2004).

16. Twenty seven of the member countries at the time the questionnaire was distributed sent their answers (non-respondent countries were Greece, Iceland and Poland). However, answering rates varied greatly between questions, being generally highest in questions regarding regulators and their powers and also pricing policies. Response rates were low for questions on concessions and franchises and to a lesser extent for PPPs, which reflect the limited use some countries have made of this instrument of delivering infrastructure. Also, answering rates were highest in the energy, telecommunications and air transport sectors and lowest in non-sector specific question areas.

Figure 1. Value of announced PPP deals, 1994-2007



Source: Dealogic Projectware database (data extracted 19/2/08).

29. The number of infrastructure projects undertaken through PPPs has increased, roughly doubling between the beginning of the decade and 2007, though falling somewhat after the middle of the decade (Table 1). Most of the contracted PPPs are in the transportation sector, particularly roads, with very few projects signed in the telecoms and energy sectors. While PPP projects are relatively frequent in the water and sewerage sectors, they tend to be comparatively small such that their share in cumulative PPP projects is quite modest. At the same time, the median size has remained relatively stable at around \$200-\$300 million. Individual projects, however, can be extremely large. In particular, transportation infrastructure projects – such as the UK’s channel tunnel rail link in 1998, the London Underground in 2002 and the Italian Autostrade in 2002 – can account for around one-third of total announced investment in any given year.

Table 1. PPPs in Infrastructure by sector

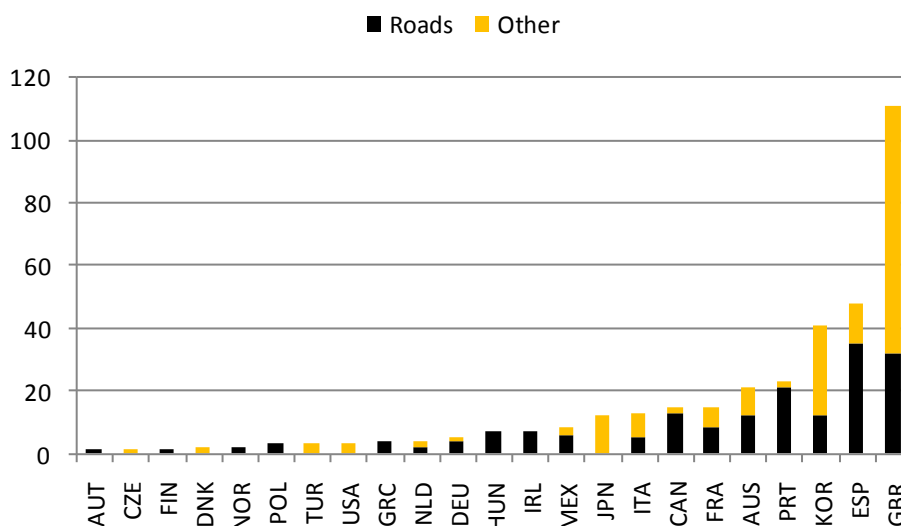
	Share in cumulative total	Number of projects	Share	Share
	1994-2007		1994-2000	2000-2007
Energy	1.75	17	0.99	1.96
Water	2.05	45	2.14	2.01
Road	51.76	163	58.32	50.15
Rail	26.60	38	24.28	27.10
Transport Other	14.37	49	9.88	15.60
Communications	0.86	6	3.23	0.14
Other	2.61	44	1.14	3.04
Sum	100	362	100	100

Source: Dealogic Projectware database (data extracted 19/2/08).

30. Project finance deals were recorded in 23 OECD countries by the end of 2007, but only a small number of countries account for the majority of contracted projects. In particular, the United Kingdom accounts for around 30% of the total number of recorded PPPs and the cumulative volume of deals in the OECD area, which together with projects in Spain and Korea comprise more than half of all signed PPPs (Figure 2). For most OECD countries, PPPs are concentrated in the road sector, with Austria, Finland, Greece, Hungary, Ireland, Norway and Poland having signed PPPs exclusively in this sector (at the time

the data was extracted). On the other hand, Czech Republic, Denmark, Japan, Turkey and the USA had not contracted any PPP in the road sector at the time the data was extracted. Countries that have a more diversified distribution of PPPs across sectors include Italy, Japan, Korea and the United Kingdom. The United Kingdom, Korea, Spain and France register a higher number of PPP contracts in the railways sector, with the United Kingdom being the only country to have signed PPPs in the IT sector.

Figure 2. **Distribution of the number of contracted PPPs in the OECD**



Source: Dealogic Projectware database (data extracted 19/2/08).

31. Table 2 displays the average time length of PPPs and concessions. The average concession period across sectors is around 30 years, though it can range from just 3 years to over 100 years in exceptional cases in the railways and roads sector. The average duration of contracts is higher in transport sectors, particularly in maritime transportation, roads and railways.¹⁷

Table 2. **Average contract length across sectors**

Sector	Average Contract Length, Years	
	Dealogic	Questionnaire
Ports	42	26
Roads	39	31
Railways	35	19
Airports	27	37
Water and Sewage	25	18
Energy	20	33
Communications	14	18

Source: Dealogic Projectware database (data extracted 19/2/08) and the OECD Infrastructure Questionnaire.

17. The sector averages obtained from the projects in the Dealogic database differ somewhat to the answers given by countries to the Infrastructure Questionnaire. The answers to the Questionnaire put airports and energy at the top of the ranking of average concession length. In general, sector averages are higher in the Dealogic database, with the exception of airports and energy. However, contract length is not displayed for all projects in the Dealogic database. Also, the Questionnaire asked for average contract length for concessions, and OECD countries may not have included the length of sectoral PPPs in their answer. These two factors may contribute to explaining the discrepancy between the two sets of averages.

32. Regarding the type of PPPs contracted, specifying the set of responsibilities transferred to the private sector, the majority of projects that detail their structure are so-called Design Build Finance Operate (DBFO), accounting for 40% of all deals; the next most frequent are Build Operate Transfer (BOT) that account for around 10% of all projects. Other arrangements are less frequently used.

2.3.2. Performance evaluation

33. The performance of PPP *vis-à-vis* traditional procurement has been assessed by comparing time delays and cost overruns. So far, the evidence is inconclusive. So called PFI projects in the UK seem to be both time and cost saving. The National Audit Office (NAO, 2003) analysed 37 PFI construction projects that had been contracted by the central government. The report concludes that only 22% of PFI projects registered cost overruns, compared to 73% of traditionally procured projects. Moreover, the cost overruns in the PFI projects resulted from changes to the specifications demanded by the public sector or other parties after the contracts had been awarded, which would also have led to an increase in price under public procurement. The report also reveals that while 70% of the construction projects carried out through traditional procurement were not delivered on time, late delivery only occurred in 24% of PFI projects.¹⁸ The same report concludes that PPPs in roads, bridges and prisons generally succeeded, while the experience is negative for IT and soft services. For hospitals and schools PPPs, the evidence is mixed.

34. In other cases, the benefits from PPPs are less pronounced. For example, there is some evidence of PPPs resulting in higher water prices in France (reflecting ‘true’ cost or just increasing costs because the project was undertaken through PPPs).¹⁹ Blanc-Brude *et al.* (2006) compare the costs of roads under PPP and traditional procurement based on *ex-ante* cost estimates and find that projects carried out through PPPs are more expensive. However, the difference found is approximately equal to the size of cost overruns in traditional by procured road projects. Their results suggest that this difference is motivated by the transfer of construction risk to the private sector in PPP schemes.

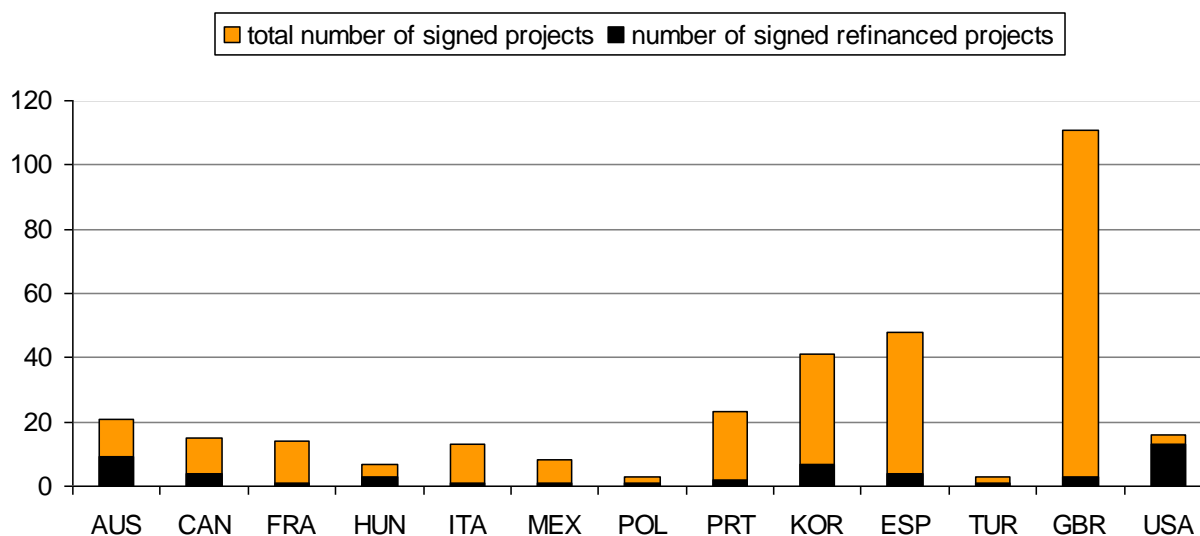
35. In the Dealogic database, only 13 projects were terminated, 10 of which were in the road sector. The reasons for cancellation vary: three were converted into traditional procurement, one concession was returned to the government with the private partners contracted to carry out maintenance, but without project finance. Other motives include the failure to pass environmental requirements, local opposition to the project, government changing views regarding toll roads after elections, and new project analysis pointing out inadequate finance. The two railway projects were suspended by the government. While one of them is going to be scaled down, the other is going forward as a traditional procurement project.

36. The database includes 53 PPP projects that were refinanced between 1995 and 2007, 3 of these had not yet been signed at the time of information collection. In this period, thirteen OECD countries refinanced and signed 50 projects, 34 of them in the road sector. Figure 3 displays the number of refinanced projects signed by OECD governments relative to the total number of signed projects. In Australia and Hungary, more than 40% of signed PPPs were refinanced, while in the United States this figure raises to 80%.

18. See also Arthur Andersen and Enterprise LSE (2000).

19. Saussier (2006).

Figure 3. Refinanced projects in the OECD



Source: Dealogic Projectware database (data extracted 19/2/08).

3. Ensuring value for money – guidelines

37. As shown above, a PPP type contract will not always be superior to traditional procurement approaches or to the cases where the government itself provides infrastructure. This section establishes the criteria needed to determine whether PPPs are a good solution for infrastructure delivery and also to guarantee that the full benefits of PPPs can be reaped. Good practices are highlighted, drawing from countries responses to the *ad hoc OECD* questionnaire on infrastructure investment.

3.1 Embarking on a PPP

38. **Decision making framework.** A robust decision-making framework is essential in ensuring that the PPP is the appropriate investment structure. A cost-benefit analysis of PPP relative to traditional procurement should be undertaken. Moreover, the net benefits of a project should be calculated using a whole-life cycle approach. Most countries (except Norway and Turkey) report that they compare PPP and traditional procurement methods before contracting out infrastructure investment. Roughly one half of questionnaire respondents noted that the government will consult with an independent body over the desirability of a PPP in infrastructure, but only three countries report that performance is evaluated *ex post* by an independent body.

39. **Minimising transaction costs.** Infrastructure projects delivered through PPPs typically embody higher transaction costs, given their longer tendering phase and higher bidding costs compared with traditional procured projects. Moreover, the fact that PPPs involve private finance implies that financing the investment under a PPP is more costly than under traditional procurement.²⁰ Transaction costs are to a large extent independent of the size of the project, rendering PPPs inappropriate for low-value projects. One way to circumvent this problem is to set minimum project value requirements for a PPP to be

20. A proper analysis of the costs of private finance should take into account the possible distortionary effects of the taxes raised to finance the investment in the case of public procured projects. This consideration is more relevant for PPP projects which entail user charges as the stream of revenues rather than transfers from the public sector.

considered as an infrastructure delivery option and to allow small infrastructure projects to be bundled to achieve a critical size. In the OECD, Austria, Belgium, Ireland, Portugal and the United Kingdom set minimum project value requirements for infrastructure projects, while Austria and Belgium report to allow bundling of small projects.

40. Delays in obtaining planning permission as well as necessary local authority and environmental approvals can cause time delays and cost overruns in PPPs contracts (Monteiro, 2005). However, only eight countries reported obtaining all of these permissions before calls for tender; ten countries reported that environmental licences are obtained and two countries reported that neither licences nor planning permissions are obtained before calls for tender (Denmark and Netherlands). Transferring licensing risk to the private sector is costly, as bidders put a high premium on this risk (Monteiro, 2008). If the public sector retains this risk (by not obtaining the necessary licenses prior to tender), it will have to compensate the private sector for unforeseen project changes required by the licensing process, with the associated risk of lengthy renegotiation, possibly aggravated by the opportunistic behaviour of the private sector.

3.1.1. Accounting the fiscal impact of PPPs

41. The implications of PPPs on public accounts should be correctly evaluated so that the public sector does not incur in unexpected losses, transferring infrastructure costs to future generations. For instance, the comparison of the costs between private and public finance can be distorted if governments discount the future payments heavily as a result of their time preference (Grout, 1997). Moreover, not correctly assigning the costs of PPPs to the government budget will necessarily distort the analysis about the merits of PPPs compared to traditional procurement.

42. A thorough assessment of the long-term fiscal implications should be part of the decision making process. In fact, given the nature of PPP contracts, even if risk is transferred to the private sector, governments still entail a significant risk as the private partner may try to renegotiate the contract. Given the threat of service interruption, governments can be forced to make unanticipated transfers to the operator. Despite these risks, only nine countries responding to the OECD questionnaire report that PPPs are accounted for as contingent liabilities in government accounts.²¹

43. A correct assessment of the implications of PPPs will discourage its use to shift spending off government's balance sheets. This is important, as the treatment of PPPs does not always reveal the extent to which PPPs are being used. For example, in the European Union, Eurostat classifies the assets of PPP projects based on three types of risk: construction, availability and demand risk. According to this rule, the assets that result from the PPP are classified as government assets if the public sector retains most of the risk.²² This will lead to most of the assets being classified as private as the contractor typically bears construction and availability risk (Corbacho and Schwartz, 2008). The government can bear other risks, including demand risk while the PPP is treated as a private investment.

44. This classification does not reflect effective fiscal risks borne by governments. Moreover, it does not encourage an efficient risk share either, and can create moral hazard, as governments, faced with tight public budgets, will be tempted to chose an allocation that aims at passing the Eurostat test, classifying a

21. See Irwin (2008) for a proposal on ways to impose limits on PPP commitments, under the broader objective of incorporating them into fiscal targets.

22. The government bears most of the construction risk if payments to the private partner are not linked to the state of the asset; the government bears most of the availability risk if payments are independent of service delivery; if the government makes payments to the private sector independently from the demand level, the government bears most of the demand risk. For a detailed discussion on the Eurostat rules see IMF (2004), Corbacho and Schwartz (2008).

PPP as private to meet the GSP criteria. Biasing the decision on how to deliver infrastructure in favour of PPPs exposes governments' to the risk of unplanned debt, at the expenses of future generations.

3.2 *Tendering*

45. Bidding for PPPs entails significantly higher costs than for traditional procurement. Higher bidding costs stem from the bundling of the construction and operation phases which renders PPP projects significantly more complex than the ones that are publicly procured. Dudkin and Välilä (2005) analyse the level of transaction costs involved in PPPs during the bidding and negotiation phases and estimate them to reach 10% of a project's capital value. Blanc-Brude *et al.* (2006) analyse *ex-ante* construction costs (costs borne before construction actually starts) in a sample of PPPs in the road sector financed by the European Investment Bank between 1990 and 2005 and find that these are about 20% higher than traditionally procured road projects. Chong *et al.* (2006) also find evidence of the importance of transaction costs for French water distribution.

46. The higher complexity of PPP projects limits the number of bidders in relation to public procurement, making collusion a possible outcome, undermining the case for PPPs.²³ According to NAO (2007), PFI projects in the United Kingdom do not receive enough developed bids for a viable competition to exist. For PFI projects between 2004 and 2006, NAO (2007) reports that 30% of the projects only received two bids, 50% received three and 20% received four bids. The NAO report identifies lengthy tendering periods and high bid costs as the main causes behind the low level of bidders.

47. One possible solution to increase the potential number of bidders for a PPP project is to allow international companies and consortia to participate in tendering. The answers to the OECD infrastructure investment questionnaire reveal that there are few restrictions on bidding for franchises or concessions. In the OECD, only two countries (Finland and Korea) note that there are constraints on international bidding. Most countries report there are legal obligations to determine the criteria for winning a tender and to publish these criteria (15 and 16 out of 19, respectively). Furthermore, most countries also allow the decision of the contract authority to be challenged in court.²⁴

48. Additionally, so-called PPP Units (typically public or partly public agencies) can assist private bidders in shaping their proposals to meet the requirements of the public sector by providing detailed information regarding the infrastructure projects sought, bidding application procedures and PPP implementation. Disseminating information and technical expertise on PPP contracting would encourage private sector participation and contribute to a decrease in bidding costs.

49. Expertise is a key emerging constraint in managing PPP projects. PPP Units constitute a centre of public sector expertise, contributing to monitoring PPP performance. They can also facilitate the spread of knowledge and the exchange of experiences across the different government bodies that can contract PPPs (especially to local and regional government bodies, with less experience in managing PPPs). Different approaches in the public sector have been taken, such as specialist units in the Ministry of Finance (Ireland and Italy) or quasi-public bodies such as the UK.²⁵ With the aim of sharing PPP experience and helping

23. Auction design can have an important consequence on *ex-ante* competition, as demonstrated by the disparity of outcomes during the auctioning of UMTS of "third generation" mobile-phone licenses at the beginning of the decade (Klemperer, 2002).

24. There is one caution with ensuring competition that arises when quality is poorly observable but an important determinant of cost. In this case there may be a danger of awarding the concessions to the lowest-quality provider.

25. See Farrugia *et al.* (2008) for a comparison of organisational structures and other characteristics of PPP units worldwide.

disseminate information within the public sector in Europe, the European Investment Bank, the European Commission and the European Union member and candidate countries have launched in September 2009 the “European PPP Expertise Centre”.²⁶

50. The EU Commission has introduced a new selection procedure, labelled “Competitive Dialogue”, which is meant to be applied to complex contracts such as PPPs.²⁷ It seeks to maintain the competition tension for longer and to reduce the scope of renegotiation after the preferred bidder has been selected. Under this mechanism, the bidders selected in the prequalification stage are invited to participate in a dialogue with the aim of identifying and defining the means best suited to meet the needs. This will take place in successive stages to reduce the number of solutions (including pricing) discussed and the bidders involved. Once the solution has been found, the contracting authority declares the dialogue phase to be closed and final tenders are sought. This procedure may indeed bring down the possibility of opportunistic behaviour, by identifying alternative providers for the asset, but may also increase tendering costs.

3.3 Contract structure: Managing a long term relationship

3.3.1. Focusing on output specifications

51. If the outcome of the decision process favours a PPP as the instrument to deliver a specific infrastructure, the following step is to carefully design the contract in order to extract the benefits stemming from private sector participation in terms of innovative technical solutions and management skills it may bring to the project. However, contract design is not always structured so as to exploit the potential advantages of PPPs, frequently specifying input rather than output specifications, which reduces the ability of the private firm to improve quality in the construction phase. In the questionnaire responses, 12 countries reported setting input specifications against 16 reporting that output specifications were used.

3.3.2. Effective and appropriate risk share

52. PPP agreements are long term contracts, typically lasting for about 30 years. Contract length should be higher in sectors where demand risk is low (as in the water sector), and lower in sectors where demand conditions can be hard to forecast such as certain projects in the transport sector.

53. During the time the contract is in force, it will probably have to be renegotiated to meet changing conditions, at the interest of both parties. Although PPP contracts should be flexible, in order to avoid lengthy re-negotiation and opportunistic behaviour they should specify the events that may justify a revision of contractual clauses. Answers to the questionnaire show that in 11 (out of 16) countries it is possible to review PPP contracts before the established deadline for renegotiation or before the end of the contract, with only 8 countries reporting that contracts contain clauses specifying the conditions under which they can be reviewed.

54. Given that the government is in fact the provider of last resort and contractors are aware that public authorities cannot afford an extended period of service disruption (which could also occur as the result of re-tendering a PPP contract), contracts should contain clauses related to risks. Responses to the questionnaire revealed that there is considerable diversity in how risk sharing is implemented in the contracts. For example, most countries responding to the questions on PPPs noted that they imposed limits on the debt the private contractor could incur; fewer countries (9) reported that PPP contracts contain revenue sharing clauses and only seven countries reported that the contracts specify minimum revenues from sales.

26. See <http://www.eib.org/products/events/epec.htm>.

27. See Article 29 of Directive 2004/18/EC.

3.3.3. Ensuring investment and quality in infrastructure

55. The long term nature of PPPs' contracts, coupled with the fact that the client is the government²⁸, generates uncertainty about future events, including the possibility of expropriation, which in turn will lead the private contractor to hold up his investment decisions.²⁹ Moreover, as the end of the contract is approaching, the contractor will be even less willing to invest, fearing that he will not be able to enjoy the benefits brought by the investment. Underinvestment problems need to be mitigated through appropriate institutional design and contract structure that create incentives for the private partner to invest.

56. *Overall investment incentives.* In order to guarantee sufficient investment levels throughout the life cycle of the asset, the risk of contract cancellation needs to be low. The existence of mechanisms that formalise contract renegotiation may help enhancing investment incentives, by creating a stable institutional environment to avoid problems of possible opportunism and uncertainty. More importantly, the public sector needs to be viewed as reliable partner, which calls for the existence of a political consensus towards honouring PPP contracts independently of the electoral cycle.

57. Another mean to bolster investment incentives is to extend the contract for a long period, allowing the private contractor to recover the cost of the investment made. On average, PPP contracts are set for an average of 30 years, although there are differences across sectors and countries. In the energy sector, PPP contracts span from 10 (Italy) to 30 years (United Kingdom).while airport PPPs range from 13 (Turkey) to 50 years (Spain).³⁰ Port PPPs are granted for a minimum of 30 years (Spain) to a maximum of 50 years (Korea). The most long lived PPPs are found in the railway sector (90 years, in the UK) and in the roads sector, where a significant number of countries signed contracts of over 50 years (Canada, France, Spain, the UK and the USA), with some contracts almost reaching 100 years.³¹ The hold-up problem when the contract is near the end is likely to be severe in the water industry, given the very long asset life and the highly specific nature of the investment. Paradoxically, concession lengths are comparatively short in this sector, according to answers given to the Questionnaire, averaging 18 years, although there is a certain degree of discrepancy between countries, with contracts lasting between 10 (Australia) and 30 years (Italy, Netherlands and Portugal). However, the policy objective of encouraging investment by stipulating long term contracts needs to be weighed against the caveats of such long term contracts, specifically the potential adverse effects of lack of competition and of increased uncertainty about future contingencies that can negatively affect contract performance.

58. Unrealistic demand forecasts have been a feature of some PPPs, particularly in the road sector. With the intention of minimising demand risk for the private operator, some contracts include no-compete or exclusivity clauses.³² The questionnaire responses reveal that 8 out of 20 countries permit no-compete clauses in their concession contracts. Geographical exclusivity rights are granted in eighteen of the respondent countries, being more pervasive in the electricity (transmission and distribution) and water sectors. Of course, granting such conditions can conflict with other policy objectives and have undesired negative consequences, such as low productivity and service quality. In this light, the extent to which no-compete and exclusivity conditions are offered needs to be carefully tailored to investment requirements.

28. Even if the project is paid through user charges, the government remains the private sector's legal partner.

29. The hold-up problems that lead to under-investment are common both to PPPs and concessions.

30. Responses to the Questionnaire reveal also long concession periods in air transport infrastructure in Hungary (75 years) and Mexico (50 years).

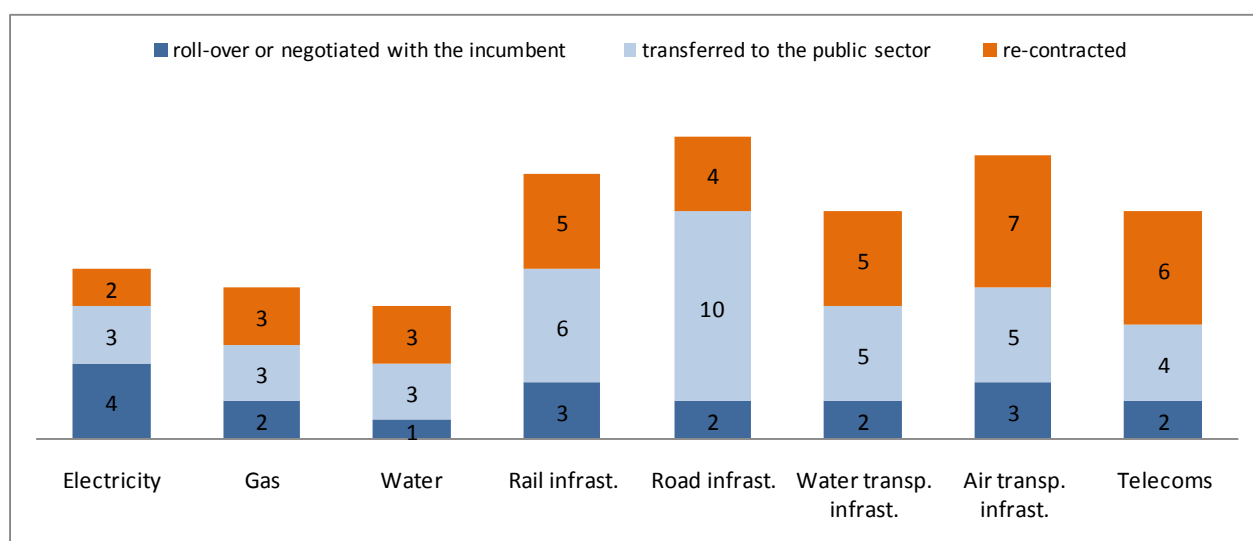
31. *Source:* Dealogic database.

32. However, when demand growth is significant this type of contract structure can limit the ability to counteract congestion as has been reported for some US highways.

59. Asset ownership reduces the hold-up problem and constitutes an incentive for investment in quality, especially if the contract does not include a clause granting preferential treatment to the government.³³ The advantages of private ownership are likely to be greater for generic facilities, that have potential private buyers, rather than for facilities like hospitals and schools, for which design/construction is very specific.

60. One of the usual features of a PPP is that at end of the contract assets revert to the government. In this case, to ensure that the contractor keeps investing, the contract should contain rules to guide the definition of the asset residual value. Only ten countries reported that contracts typically contain such clauses. In the case of franchises, the questionnaire responses revealed that rolling over concession contracts in favour of incumbents is less common than transferring assets to the state or re-contracting (Figure 4). To guarantee investment, the contractor should be compensated for the residual value of the assets, but only one third of the countries where the asset is transferred back to the state compensate the franchise holder.

Figure 4. **Outcomes at the end of a franchise**



Note: The numbers in the bars gives the number of countries reporting each response. The differences reflect that fewer countries reported franchises in some sectors and also that multiple outcomes were possible, particularly in the transport sector.

61. Another approach to mitigate this problem is to bias renewal in favour of the incumbent. Only the Slovak Republic responded that the incumbent is treated as a preferred bidder.³⁴ An alternative approach is to require the reinvestment of profits, a clause which is only included contracts in Belgium and Mexico (and only in the water sector in the latter), out of 17 respondent countries.

62. *Pricing policies:* Pricing policies should compensate the private operator for investments throughout the concession period, without creating incentives for over-investment. Almost all countries (except Japan and Sweden) reported that pricing policies reflect investment needs, particularly in the electricity and gas sectors. To avoid overinvestment, after a cost-reducing investment, prices should only be modified at the next round of contract revision and should not fully compensate the operator. In most

33. By helping to mitigate under-investment, private ownership constitutes an attractive feature of PPP contracts, relative to concessions and franchises.

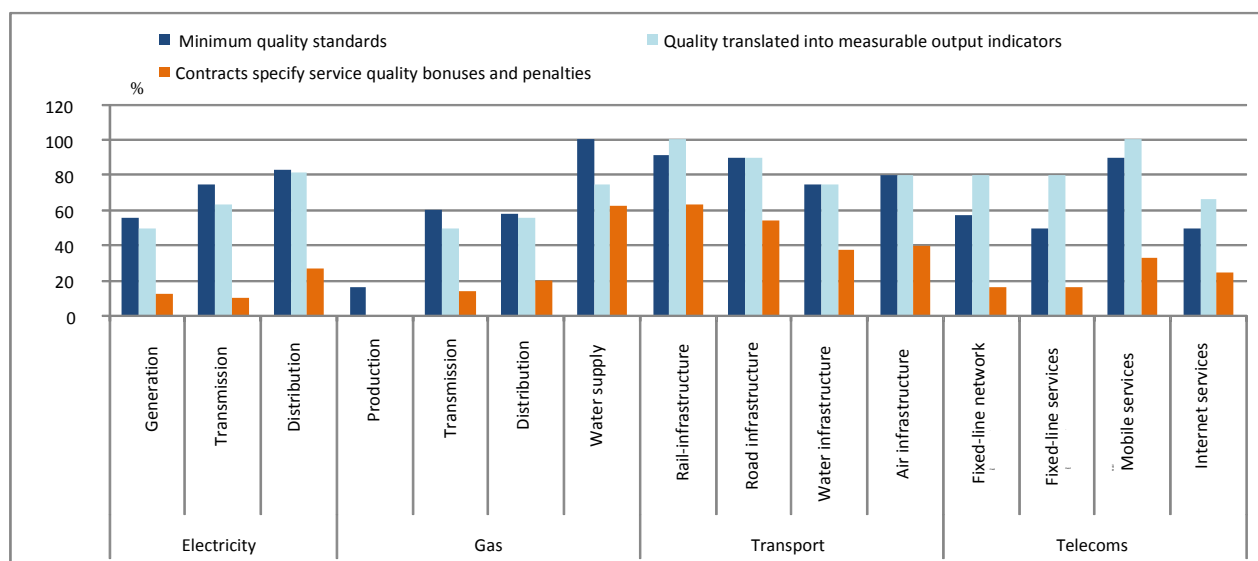
34. There may be other ways that the incumbent may benefit, however. Klein (1998) notes that a discount rule used in the French water industry typically meant that the concession was re-awarded to the incumbent.

countries the timing of compensation is sector specific (though Norway adjusts prices at the time of the cost-saving investment). Price adjustments at the next round occur particularly in the electricity, gas and railroad sectors. The evidence is mixed with respect to the amount of the compensation, though some countries appear to have a policy of full compensation (Norway, Portugal). To mitigate the problem of under investment when the contract is approaching the end, contracts should entail increasing incentives over time to foster renewal of investment. With this aim, fixed-price agreements should be in place close to the end of the contract.

63. *Quality.* If the quality of the services can be contracted, *i.e.* specified in the contract and verifiable in the court of law, the government is able to enforce the level of quality it so wishes and reflect it in the payments to the contractor and/or in user charges. The public sector should then specify clearly the quality sought for the services to be delivered by the private sector and translate these into measurable output indicators. Contract clauses should also establish a clear link between service payments and the quality of service delivery. If such provisions are not included, the government incurs in fiscal risk by raising the possibility of contract renegotiation.

64. In cases where quality cannot be contracted but is observable *ex-post*, the government can use subsequent procurement projects to punish low quality providers. Investments in quality throughout the life of the contract can be encouraged if the contract allows the facility operator to increase price after an investment in quality (by granting “access holidays”).

Figure 5. Use of regulatory tools to maintain quality

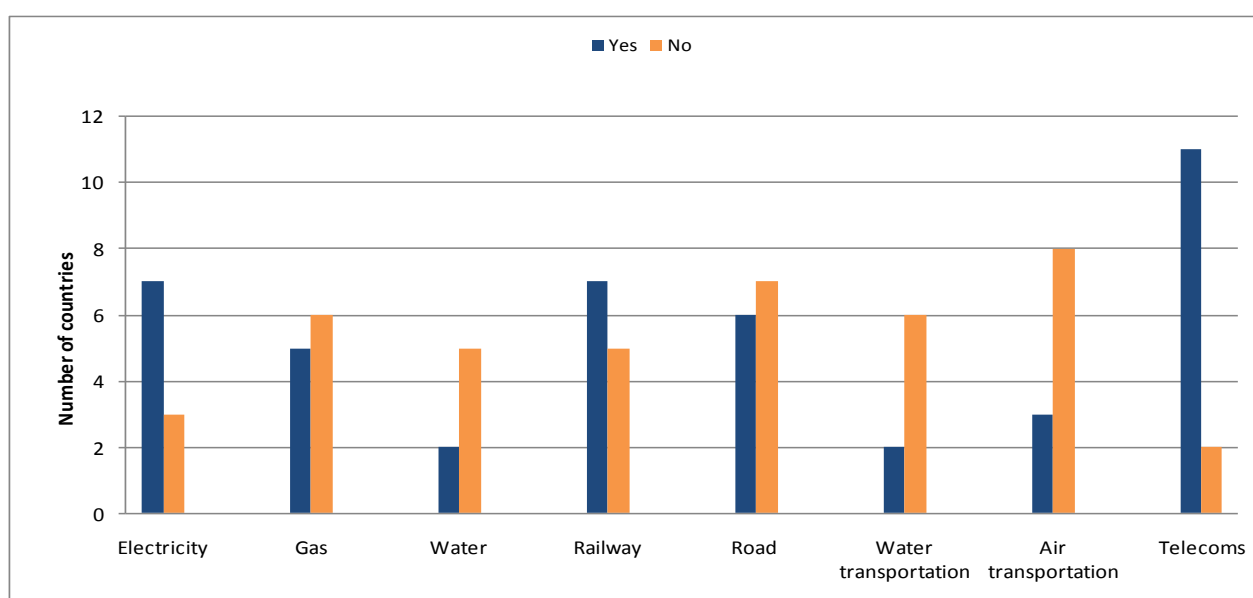


Note: The percentages reported are the number of countries reporting the given regulatory tool as a percentage of the countries reporting having franchises in the given sector.

65. In the light of hold-up problems, the regulator may need to determine and monitor investment. This is obviously easier for some types of investment and industries than others. The regulator can set quality standards, use performance indicators, rely on benchmark competition and specify bonuses and penalties in the franchise or concession contracts to enhance the incentives for the franchise holder to invest and maintain assets. From the questionnaire responses it is quite common for the contractor to establish quality standards and to translate these into measurable output indicators (Figure 5). The use of benchmarking to promote competitive outcomes and the use of bonuses and penalties to give franchise holders higher powered incentives to care about quality is less common, though generally more prevalent in the transport sector.

66. An alternative or additional mean to ensure that the contract holder at least maintains infrastructure quality is to allow a greater say to users on investment. In some sectors, such as telecommunications, rail and electricity, established arbitration procedures to settle disputes between operating and using companies over investment and maintenance of the network are relatively more prevalent (Figure 6).

Figure 6. Arbitration procedures between the network operator and network users



4. An indicator of efficiency enhancing features of PPP frameworks

67. To address the several issues discussed above, a composite indicator was constructed. The basic idea behind the indicator is to convert qualitative data on countries' experiences with PPP implementation and management into a quantitative indicator designed to assess countries' experiences in view of what are considered best practices based on theory or on documented experience, and to compare countries' relative performances. It constitutes a first approach to a quantitative assessment of OECD countries' policies in this area.

4.1 Methodology

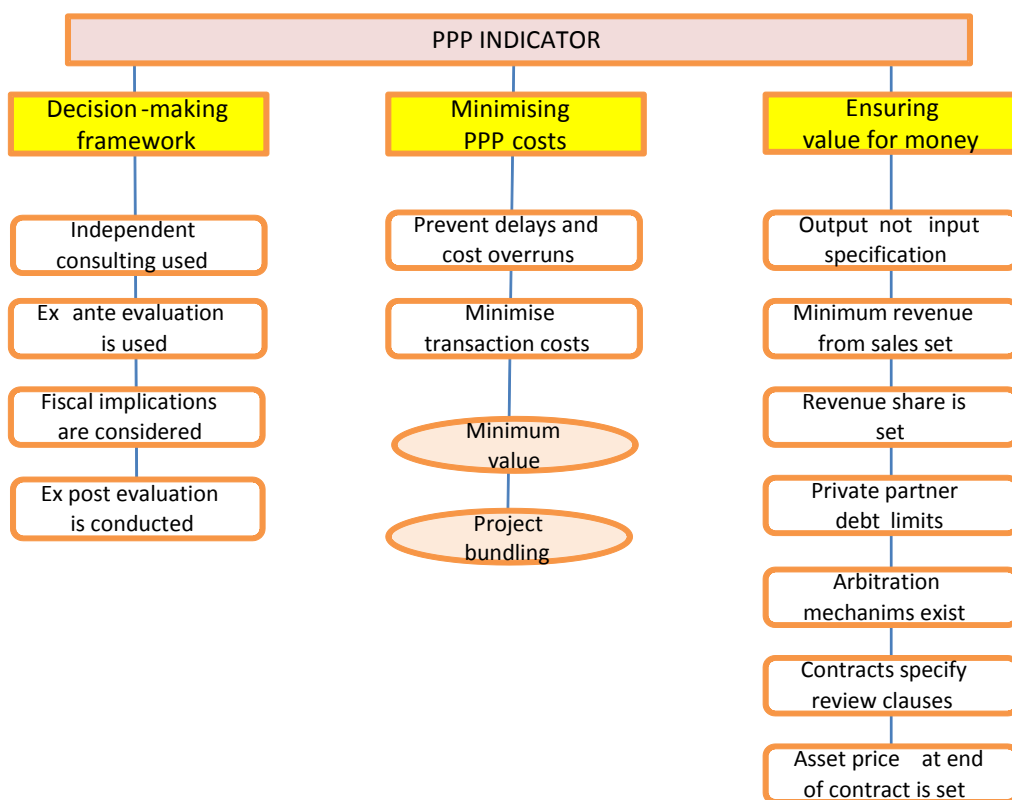
68. All the information used to compute the indicator comes exclusively from the answers given by the member countries at the time the questionnaire was distributed, to section three of the questionnaire on infrastructure investment. The first part of this section focus on state planning of infrastructure investment. It aims to identify country practices that may cause delays in infrastructure investment and regulatory policies put in place which can provide incentives for private investment in infrastructure without leading to overinvestment. The second part of the section addresses PPP design and implementation issues, such as the existence of mechanisms to assess the rationale for delivering and maintaining infrastructure through PPPs, proper accounting of their fiscal implications, contract design and evaluation methods. The answers reflect existing policies in OECD countries at the time the questionnaire was conducted (between the end of 2007 and the beginning of 2008).

4.1.1. Structure

69. Figure 7 shows the tree structure of the PPP indicator. It covers countries’ practices in three main areas of policy design that were identified as potentially affecting the success of a PPP project. They constitute the sub-level indicators of the synthetic PPP indicator:

- *The Institutional Decision Making Framework.* This covers aspects relating to how the public sector decides to finance an infrastructure project through PPPs, namely whether:
 1. An independent agency or consulting firm provides guidance on the desirability of specific infrastructure projects being delivered through PPPs;
 2. An assessment of the costs and benefits of PPPs over traditional procurement is carried out;
 3. The long term fiscal implications of PPPs are accounted for as contingent liabilities in government accounts;
 4. PPP performance is evaluated ex-post, that is to say, whether the outcomes from a PPP are compared to the economic policy objectives set *ex-ante*, including financial objectives.

Figure 7. Indicator structure



- *Ways to minimise PPP costs.* Contracting an infrastructure facility through PPPs is more costly than through traditional procurement. Also, some OECD countries have experienced increased contracted costs and/or time delays in building infrastructure facilities. This sub-level indicator focus on ways to minimise transactions costs and prevent delays and cost overruns, through:
 1. Defining a minimum project value for infrastructure delivered through PPPs;
 2. Allowing bundling of PPP contracts in order to meet minimum amount requirements;
 3. Obtaining licenses and planning permissions before calls for tender are made.
- *Contract specification issues to ensure value for money.* This sub-level indicator focus on contract clauses that can contribute to deliver cost effective infrastructure through PPPs and to ensure a sufficient amount of investment and good quality delivery, while simultaneously guaranteeing the attractiveness of these arrangements to the private sector. PPP contracts should contain clauses defining the following:
 1. Output rather than relying exclusively on input specifications;
 2. Minimum revenue from sales and revenue share;
 3. Limits to the amount of debt the private partner is allowed to incur;
 4. Mechanisms to define the price at which the government will acquire the asset at the end of the contract;
 5. Conditions under which the contract can be reviewed before the established deadline for renegotiation;
 6. Arbitration mechanisms.

4.1.2. *Structure construction of the indicator and coding of answers*

70. The indicator is coded by assigning a numerical value to each of the possible responses to a given question or combination of questions that constitute a policy element identified as potentially affecting the success of PPPs. The coded information is then normalised on a scale of zero to six, reflecting practices that are increasingly likely not to lead to the best outcomes. The data is then aggregated into sub-level indicators by assigning equal weights to the various lower-level items that constitute each of the sub-level indicators. Finally, the sub-level indicators are aggregated into a higher level (composite) indicator by, once more, assigning equal weights.³⁵ This bottom-up approach allows tracing back indicator scores to countries' individual policies. Table 3 presents the coding of answers for each sub-level indicator.

35 However, since each sub-level indicator incorporates a different number of policy dimensions, proceeding in this way implicitly attributes different weights to these policy dimensions that are part of each sub-level indicator. Nevertheless, given the absence of theoretical guidance on the relative importance of each policy dimension that is relevant for the success of PPPs, equal weights were preferred since they have the advantage of being more transparent and make it easier to understand the final scores of the composite PPP indicator.

Table 3. Composition of sub-level indicators

Panel A. Decision-Making Framework			
Coding of data			
	Independent agency consult which is not the sector regulator	Independent agency consult which is the sector regulator	No independent agency consult
Does the government consult with an independent agency or consultancy firm regarding the desirability of conducting a PPP in its infrastructure investment projects? Is this agency the sector regulator?	0	3	6
Yes			No
When deciding how to finance a new infrastructure investment, is an assessment of the costs and benefits of PPPs over traditional procurement carried out?	0		6
Yes			No
Are long-term fiscal implications of PPPs accounted for as contingent liabilities in the government accounts?	0		6
	Evaluation by an independent agency consult which is not the sector regulator	Evaluation by an independent agency consult which is the sector regulator	No ex-post evaluation
Is there an independent agency or consultancy firm that evaluates PPP performance ex-post? If the answer is "yes", is this entity the sector regulator?	0	3	6

Panel B. Minimising PPP costs				
Coding of data				
	All 3 licenses obtained	2 licences obtained	1 license obtained	No licence obtained
Preventing delays and cost overruns: - Does the contractor (a public body) usually obtains planning permission before calls for tender are made? - As a principle, is environmental licensing obtained by the public body before calls for tender are made? - If applicable, are local authorities' licenses obtained by the public body before calls for tender are emade?	0	2	4	6
Minimum project value + bundling allowed	0		3	6
Minimum project value but no bundling allowed				6
Minimising transaction costs: - Is there a minimum project value required for a PPP to be put in place? - If the answer is "yes", is bundling of PPP contracts allowed in order to meet the minimum amount required?	0		3	6

Panel C. Ensuring Value for Money			
Coding of data			
	Output specifications only	Both output and input specifications	No output specifications
Do the PPP contracts typically contain clauses for: Output, not input specifications - input specifications - output specifications	0	3	6
minimum revenue from sales from the public share of revenues	0		6
debt incurred by the private partner to finance investment	0		6
arbitration mechanisms	0		6
price at which the government will acquire the asset at the end of the contract	0		6
No possibility of contract review before established deadline		It is possible to review contracts before the deadline but conditions are specified in contracts	It is possible to review contracts before the deadline, no pre-conditions specified
Contracts specify review and clauses: - Is it possible to review PPP contracts before the established deadline for renegotiation or the end of the concession period? - If the answer is "yes", do the contracts typically contain clauses specifying the conditions under which they can be reviewed before the established deadline for renegotiation or the end of the concession period?	0	3	6

71. Of the twenty-seven countries who answered the questionnaire, four (Finland, New Zealand, Sweden and the UK) did not provide answers to the relevant questions in Section 3 that were necessary to compute the indicator.³⁶ Additionally, the indicator was not computed for countries whose answers did not allow the construction of all the sub-level indicators. This was the case of Switzerland, Netherlands (for which two sub-level indicators were computed) and Denmark and Luxembourg (with only one sub-level indicator computed). However, missing answers to specific questions within each sub-level indicator did not prevent its calculation. For these cases, the value of the sub-level indicator is taken as a simple average of the coding attributed to answered questions. This option was favoured given that the fundamental objective behind the construction of the indicator is to provide an assessment of countries PPP frameworks and how distant they are from a best – performing enhancing – framework. To achieve this, it is preferable to take the stock of all relevant information on PPPs practices rather than focusing on answers given by all countries, which would reduce the scope of the analysis, and be incomplete by leaving out important determinants of PPP performance. On the other hand, from a country perspective, this option has two caveats: first, the loss in consistency will raise the question of whether the computed synthetic indicator constitutes a good approximation of the “true” PPP indicator value for a given country; secondly, it also raises issues of comparability between the countries who provided an extensive overview of PPP policies and countries with poor answering rates.

4.2 Results

72. Figure 8 displays the distribution of the PPP composite indicator and its sub-level indicators. The indicator of efficiency enhancing features of PPP frameworks indicates that taken together, OECD practices towards PPPs assume medium values of the indicator, with more than half of the countries having an aggregate score of less than 3.

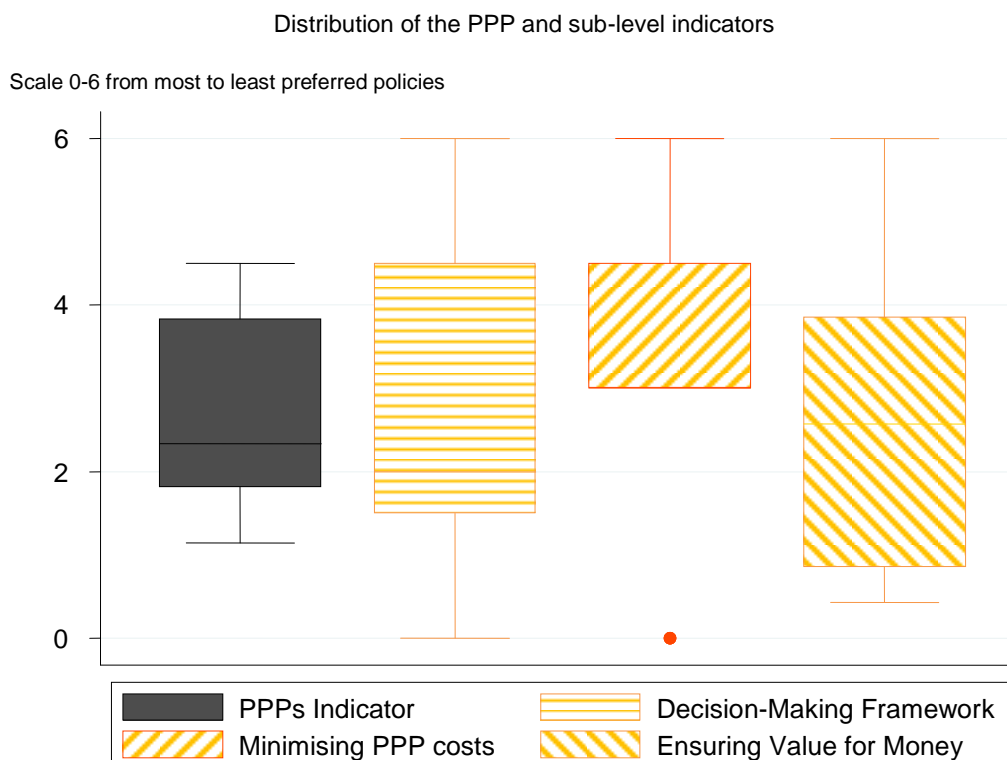
73. Although there is no great variation in the PPP composite indicator across OECD countries, the box plots evidence great variation in the sub-level indicators, particularly in the indicators concerning the “Decision Making Framework” and “Ensuring Value for Money” through appropriate design of contractual clauses.

74. As regards the decision making framework, which assesses evaluation methods on the desirability of conducting infrastructure investment through a PPP and its outcomes, countries’ practices range from “most preferred” (corresponding to a value of 0 of the sub-level indicator) for Canada and the Czech Republic to “least preferred” (value of 6) for Norway. The specific policy domain where countries performed worse was in the implementation of *ex-post* evaluation of PPP performance, which is conducted in only three of the fifteen countries which answered this specific question (Austria, Belgium and the Czech Republic). All other countries do not judge the results obtained under PPP contracts. On the other hand, sixteen out of eighteen countries assess the costs and benefits of delivering infrastructure through PPPs over traditional procurement. More than 50% of the respondents reported that PPPs are accounted as contingent liabilities in government’s accounts.

75. In general, countries perform poorly when it comes to minimising the probability of incurring in time delays and cost overruns. Despite the sub-level indicator being skewed to the left, there are four countries who obtain a score of 0, indicating that most preferred policies are used: Austria, Belgium, Germany and Ireland. All the responding countries obtain at least some of the required permissions and licenses, but only the four countries, out of 18 responding countries, simultaneously set minimum project value as a precondition for embarking on a PPP and allow project bundling in order to meet the minimum amount required.

36. New Zealand, Sweden and the UK reported that PPPs or concessions and franchises have not been used to finance infrastructure investment.

Figure 8. Indicator of efficiency enhancing features of PPP frameworks



Note: the box plots display the box that covers the observations between the 1st and 3rd quartiles. The whiskers extending from the box give the range that captures the observations which lie within the 1st quartile minus 1.5 times the inter-quartile range and the third quartile plus 1.5 times the inter-quartile range. Dots outside the whiskers represent outliers.

76. Most public bodies in the OECD write down contractual clauses that attempt to ensure that the benefits of PPPs are attained and its drawbacks mitigated. When it comes to asset characteristics, all but one of the 18 respondent countries relies on output specifications, although 13 also answered that PPP contracts contain input specifications as well. In more than 80% of the countries PPP contracts typically contain clauses specifying the debt incurred by the private partner to finance the investment and arbitration mechanisms. However, only eleven out of 18 countries reported that contracts contain clauses referring to the price at which the government will acquire the asset when the contract reaches the end. Five countries mentioned that it is not possible to review PPP contracts before the established deadline for renegotiation or the end of the concession period, while 9 others acknowledged that PPP contracts contemplate this possibility but that the conditions for a review are stipulated in the contract. PPPs' contracts are subject of review without any preconditions being observed in only two OECD countries.

4.3 Evaluating cross and within country heterogeneity in PPP frameworks: sensitivity analysis

77. The construction of a composite indicator is likely to suffer from measurement errors, which can come from two sources: the scores attributed to each policy dimension that is included in the composite indicator and the particular weighting structure used. Regarding the first source of measurement error, it must be acknowledged that although the questionnaire attempted to cover all the policy dimensions that are judged to be relevant and likely to affect the performance of PPP arrangements, it may well be the case that these constitute only a subset of all the policy measures that indeed affect PPP outcomes. Hence, the country scores may only partly (and imperfectly) reflect the true level of efficiency enhancing features of PPP frameworks. Additionally, and although the questionnaire design tried to minimise the potential for

misinterpretation, there is always a certain degree of discretionary judgment involved in answering qualitative questions. Likewise, the transformation of qualitative data into scores also involves some ‘expert judgment’ in the interpretation of the answers, which may further constitute an additional source of bias in the values obtained for the composite PPP indicator and, consequently, on country rankings.

78. The structure of the indicator reflects the organisation of policies into three domains of PPP design that have been identified as likely to affect the outcomes reached with this mechanism of delivering public infrastructure. However, there was no theoretical guidance on the particular structure to use nor on the weights attributed to each policy domain or lower-level indicator. Again, final scores in the composite PPP indicator and country ranking would be different with another nesting and/or weighting structure.

79. To address these issues and check whether the different scores obtained by countries in what regards the composite PPP indicator are indeed indicative of significant cross-country differences in the features of their PPP frameworks, this paper applies two different techniques: the Random Weights approach, which also allows to assess the consistency of policy settings within countries, and the Country-Product Dummy approach. The Random Weights approach provides an indication of the sensitivity of the final PPP indicator scores to changes in the weighting structure, while the Country-Product Dummy approach attempts to shed light on cross country differences that may arise due to measurement error in the low-level policy indicators.

4.3.1. *Structure construction of the indicator and coding of answers*

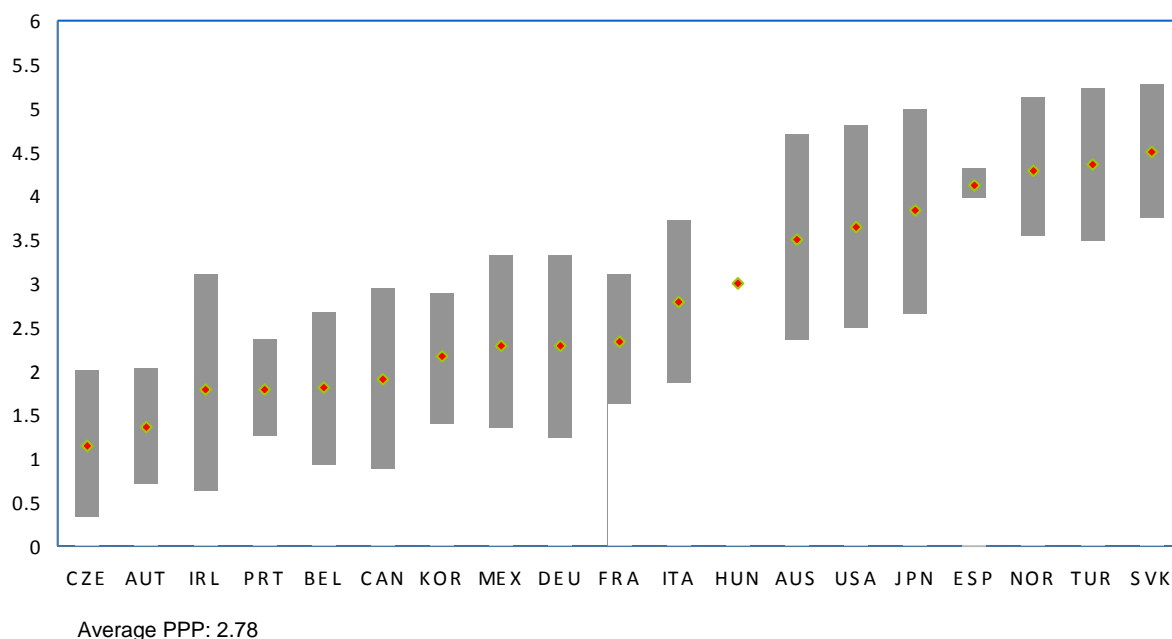
80. The Random Weights technique was used to estimate confidence interval around the scores of the composite PPP indicator. This approach consists of a Monte Carlo simulation in which an aggregate PPP score is recursively computed. Starting from the sub-level indicators that feed into the overall indicator, the random weights technique uses 10 000 sets of randomly-drawn weights to calculate 10 000 observations for the indicators. The random weights are drawn from a uniform distribution and normalised to sum to one. The resulting distribution of the PPP indicator reflects the possible ranges of values given no *a priori* information on the most appropriate value for each of the weights. It allows to construct confidence intervals for the estimated values of the composite PPP indicator. In this paper, the 5th and the 95th percentile are used to obtain 90% confidence intervals.

81. The results (Figure 9) suggest that there is marked heterogeneity in policies dealing with PPPs across countries. Policy settings look relatively favourable in the Czech Republic, Austria, Portugal, and Belgium, which are countries that have accumulated considerable experience in using PPPs. On the other hand, policies in the Slovak Republic, Turkey, Norway and Spain and, to a lesser extent, Australia, the United States, and Japan appear less conducive to effectively exploiting the benefits of PPPs.

82. The width of the confidence intervals also reflects the degree of heterogeneity of PPP settings within countries. For instance, although with a low mean value for the synthetic PPP indicator, Ireland has large confidence intervals, indicating larger variance across low-level indicators. Indeed, the sub-level indicators range between 0 and 4.5 for this country. On the contrary, countries with narrow confidence intervals have small variations in their sub-level indicator scores. This is the case of Hungary, whose sub-level indicators have all a score of 3, and Spain, whose sub-level indicators range between 3.85 and 4.5.

83. The heterogeneity found both across and within countries (although to a lesser extent) is somewhat to be expected as most OECD countries’ experience with PPPs in very recent, the number of contract signed is small and have not yet expired, so that an evaluation of PPP outcomes could be properly undertaken.

Figure 9. Indicator of efficiency constraining features of PPP frameworks



84. To illustrate the possible difference in scores that may have resulted if another weighting structure had been chosen, another indicator was constructed, in which each low level policy is assigned the same weight. Figure 10 compares the country scores obtained under the two different weighting structures. The correlation between the scores is high and statistically very significant, indicating that, although countries would have somewhat different scores under the two weighting structures,³⁷ cross country differences would not be very different. Figure 12 depicts the distribution of the PPP indicator obtained and of the sublevels. Compared with Figure 8, the main difference lies in the “Ensuring Value for Money” sub-level, which has now smaller variance. However, the impact in the overall PPP indicator is small, with the average PPP value decreasing from 1.09 to 0.99.

85. As already mentioned, the particular nesting structure chosen intends to depict the different stages in PPP contracting, and is not guided by theory. Each sub-level contributes equally to the indicator value, which leads to each lower level carrying different weights. This uncertainty in the weighting structure was already addressed by performing a random weights analysis. Of particular concern is the fact that the scores obtained resulted from partial responses given by countries, where certain questions were left unanswered. For example, in the “Decision-Making Framework” sub-level, which comprises 4 policy areas or lower levels, the score for Hungary and Belgium was computed using answers from 3 of these areas; the scores of Canada, Portugal and the United States using 2 areas, while Korea only responded to the questions relating to one of the policy areas. Partial answers were also used to compute the scores of the “Minimising PPP Costs” sub-level for Australia, Canada, Japan, Turkey and the United States. In the “Ensuring Value-for-Money” sublevel, the scores were computed using 6 answers for the 7 policy areas comprising the sublevel indicator for France, Japan and Korea, while the score of the Slovak Republic resulted from a single answer.

37. This is particularly true for Turkey and the Slovak Republic, who would have obtained significantly lower scores under equal low level weights.

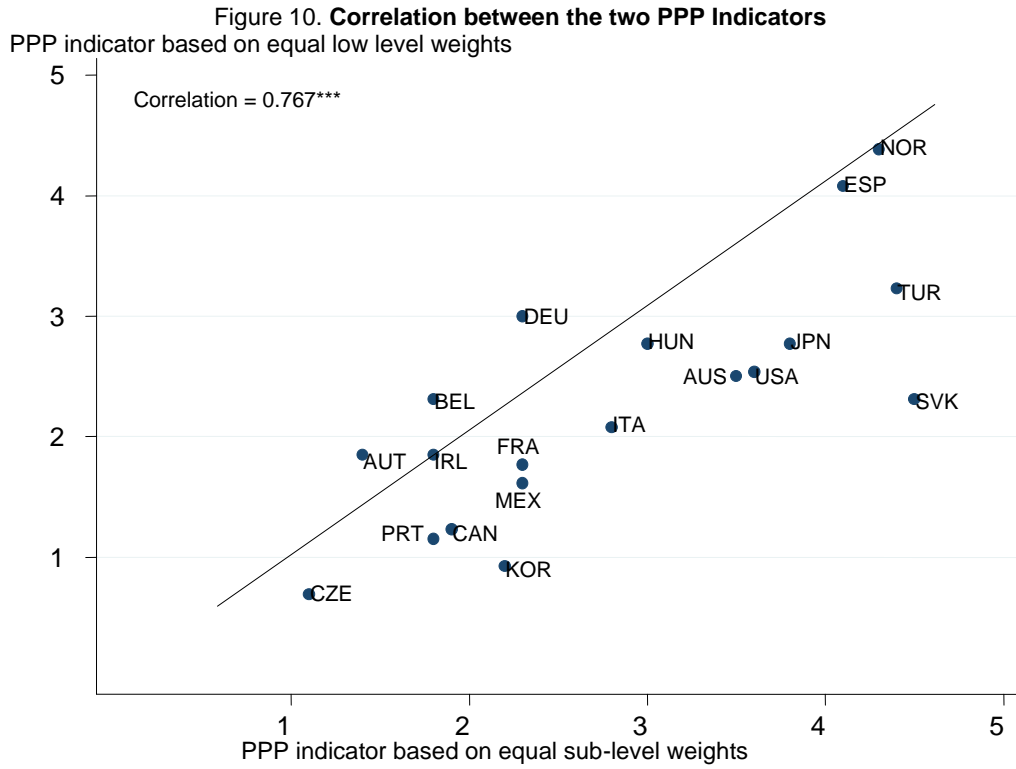
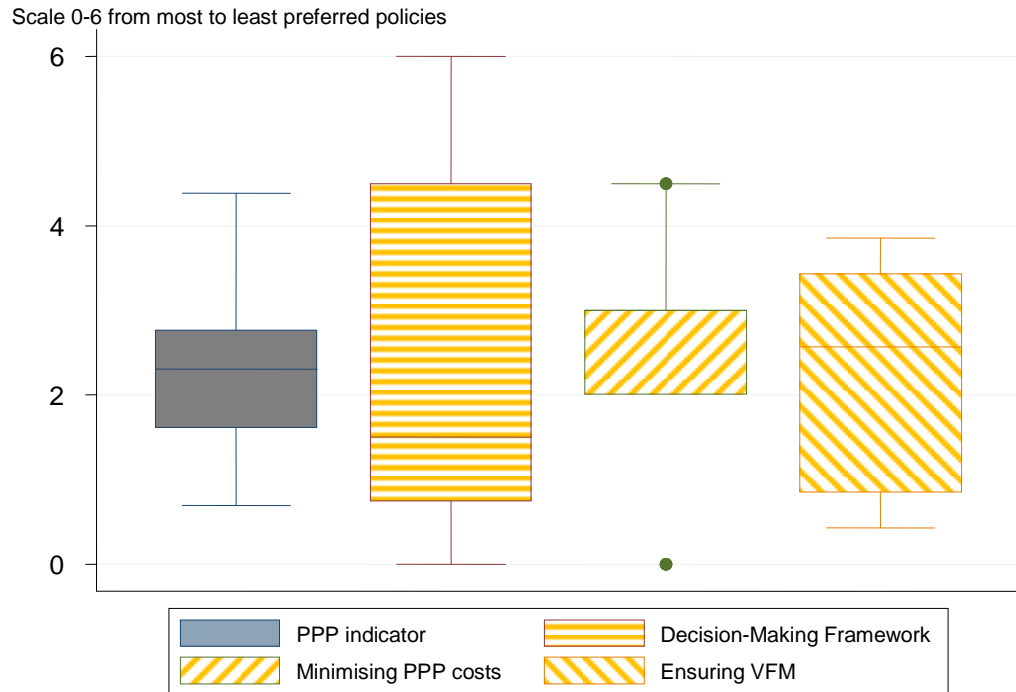


Figure 11. Distribution of PPP and low level indicators based on equal low level weights
 Distribution of the PPP and sub-level indicators



Note: the box plots display the box that covers the observations between the 1st and 3rd quartiles. The whiskers extending from the box give the range that captures the observations which lie within the 1st quartile minus 1.5 times the inter-quartile range and the third quartile plus 1.5 times the inter-quartile range. Dots outside the whiskers represent outliers.

4.3.2. Country-Product Dummy Technique (CPD)

86. To test cross-country differences in PPP frameworks and assess the possibility of errors in the measurement of the low-level indicators, the country-product dummy model was used.³⁸ The main assumption of the CPD approach is that each country has a certain level of policy measures that affect the efficiency of PPP frameworks, which is, however, not directly observable. Therefore, the PPP indicator comprises a subset of policy measures which are drawn from the population of policies that affect PPP outcomes. According to this technique, a country's low-level policy indicator is composed of a country specific term and a policy specific term, which captures the relative levels of each low level indicator across countries, plus an error term. Then, cross country differences in PPP frameworks are assessed by regressing each of the 13 low level indicators on a set of country (*C*) and policy (*P*) dummies:

$$\text{Lowlevel}_{ij} = \alpha_i C_i + \beta_j P_j + \varepsilon_{ij} \quad (1)$$

where *i* and *j* stand for country and low-level policy indexes, respectively. The left hand side variable is the value of each low level indicators in a given country. The estimated country coefficients, α , reflect the country specific level of efficiency enhancing PPP frameworks and can be used to test whether country A's framework is more conducive to higher PPP performance than country B's.

87. The results of the bilateral tests on PPP frameworks are displayed in Annex 1. The table highlights the country-pairs with significantly different PPP frameworks (countries are ordered by their scoring in the PPP indicator). For instance, the Czech Republic has a PPP framework that is significantly more likely to be conducive to better PPP outcomes than Germany, as can be seen from the plus sign at the CZE-DEU point in the first line. Conversely, Germany PPP framework can be considered better than the one of Italy, as reflected in the negative sign at the Italy-DEU point in the 9th line.

88. While the results of tests conducted on country-pairs differences are not always significant, the CPD approach allows to highlight a group of countries with less sound PPP policy frameworks and that will not guarantee that the benefits of private sector participation in infrastructure delivery will be reaped.

5. Conclusion

89. PPPs constitute a specific type of agreement between a public entity and the private sector for the provision, operation and management of a public service. The evidence does not necessarily questions the merit of PPP arrangements, but rather calls for a sound analysis of their suitability to particular infrastructure projects and careful contract design so that the benefits of private sector participation are reaped. This paper highlights the issues that the public sector needs to consider to ensure that value for money in infrastructure delivery and quality in service provision is indeed achieved through PPPs.

90. PPPs are best suited when there is a positive externality between the construction and the operating phase, which gives incentives for the private sector to internalise the costs of service provision and asset maintenance in its decisions at the construction phase. To allow the private sector to explore innovative solutions, the contract should lean towards output specification rather than input requirements. In the absence of this positive externality, the government should grant the private sector the ownership of the asset. In this case, PPPs are more suitable for generic facilities, such as leisure centres and public housing, as the number of buyers is potentially higher, allowing the private sector to enjoy a higher bargaining position relative to a situation where the public sector is the sole buyer.

38. The CPD method was developed by Summers (1973) and has recently been applied by Diewert (2005) and Prasada Rao (2005). See Wöfl *et al.* (2009) for more details.

91. PPP contracts should be of a sufficient length so that the private sector can enjoy the returns of the investment. Lengthier contracts generate uncertainty and hamper the task of specifying all the contingencies that may justify its revision. Also, renegotiating a PPP agreement entails significant costs. Against this background, PPPs are less suitable in sectors where supply or demand conditions can change quickly, as is the case of prisons, school and health sector facilities, or IT projects. They are more fitting for water and transportation sectors. Also, given that PPP contracts entail high transaction costs, they are more suitable for large infrastructure projects. Alternately, bundling of smaller similar projects should be allowed.

92. To ensure that PPPs are the appropriate investment vehicle, a rigorous *ex-ante* evaluation of the advantages of PPPs for public service provision is needed. The net benefit of the project should be calculated using a whole-life cycle approach. Furthermore, a proper assessment of its implications for the public budget needs to be undertaken. In case the private partner runs into financial difficulties or asks for contract renegotiation, the public sector is found in a weaker position as it will attempt to avoid service disruption. Indeed, the public sector is the party in the contract who in practice bears the risk, being the provider of last resort. To mitigate this problem and avoid running into unplanned debt, the government should perform a careful assessment of the risk sharing rules and include in its accounts the possible fiscal impact of PPPs. As a general rule, the private sector should not bear the risks that it cannot affect through its actions. The task of appropriately specifying risk allocation is of crucial importance, also because the appropriate means to finance the investment depend on the risk allocation between parts and the ability of the private sector to affect demand levels.

93. The government should avoid costly renegotiations by obtaining all planning permissions, local authorities and environment approvals before calls for tender are made. Additionally, the contract should include all the possible contingencies that may justify a revision of the contract clauses. By proceeding in this way, the government is minimising the possibility of potential opportunistic behaviour of the private sector.

94. It is crucial to ensure adequate investment levels throughout the length of contract in order to achieve good quality of service provision. This issue deserves careful attention, as there are many factors that can hinder investment levels. Firstly, a sound institutional environment is needed, as the private sector will not invest if the risk of political attitudes changing along the electoral cycle is high. Moreover, the government needs to build a reputation of honouring contracts and avoid situations of regulatory opportunism. Secondly, the government can grant the private sector the ownership of the asset and specify in the contract the criteria that will define its residual value, in case it reverts to the government at the end of the contract. Moreover, the government can switch to a fixed price rule as the contract approaches the end, to mitigate investment holdups at this stage. Other possible solutions include the obligation to re-invest profits, rolling-over the contract to the incumbent or favouring him in the next round of the concession award. However, in this case, the negative effects on competition need to be carefully thought.

95. The analysis of OECD countries' experiences in PPPs and concessions management reveals that there is a wide discrepancy of practices across the different policy areas, suggesting that there is scope for improving PPP performance and gain expertise by considering other countries' experiences.

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Annex 1.

Significant cross-country differences in PPP frameworks

	CZE	AUT	IRL	PRT	BEL	CAN	KOR	MEX	DEU	FRA	ITA	HUN	AUS	USA	JPN	ESP	NOR	TUR	SVK
CZE	.	(+)*			(+)**				(+)**			(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
AUT	(-)*	.																	(+)**
IRL			.						(+)*					(+)*		(+)**	(+)**		(+)**
PRT				.					(+)**			(+)**		(+)**	(+)*	(+)**	(+)**	(+)**	(+)**
BEL	(-)**				.		(+)*												(+)**
CAN						.										(+)*	(+)**		(+)**
KOR					(-)*		.		(+)**			(+)**	(+)*	(+)**	(+)**	(+)**	(+)**	(+)**	(+)**
MEX								.	(+)**			(+)**		(+)**	(+)*	(+)**	(+)**	(+)**	(+)**
DEU	(-)**		(-)*	(-)**			(-)**	(-)**		(+)*	(+)*			(+)*		(+)**	(+)**		(+)**
FRA									(-)*					(+)*		(+)**	(+)**		(+)**
ITA									(-)*							(+)**	(+)**		(+)**
HUN	(-)**			(-)**			(-)**	(-)**											
AUS	(-)**						(-)*												
USA	(-)**		(-)*	(-)**			(-)**	(-)**		(-)*	(-)*								
JPN	(-)**			(-)*			(-)**	(-)*											
ESP	(-)**		(-)**	(-)**		(-)*	(-)**	(-)**		(-)**	(-)**								
NOR	(-)**	(-)**	(-)**	(-)**		(-)**	(-)**	(-)**		(-)**	(-)**								
TUR	(-)**			(-)**			(-)**	(-)**											
SVK	(-)**	(-)**	(-)**	(-)**		(-)**	(-)**	(-)**		(-)**	(-)**								

Note: Stars denote the level of significance: *: 90%, **: 95%, ***: 99%.

The table contains the results from cross-country dummy model estimations. The cross country differences in PPP frameworks are assessed by regressing each of the 13 low level indicators on a set of country (C) and policy (P) dummies: $lowlevel_{ij} = \alpha_i C_i + \beta_j P_j + \varepsilon_{ij}$, where i and j stand for country and low-level policy indexes, respectively. The left hand side variable is the value of each low level indicator in a given country. The estimated country coefficients, α , reflect the country specific level of efficiency enhancing PPP frameworks and can be used to test whether country A's framework is more conducive to higher PPP performance than country B's. The table highlights the country-pairs with significantly different PPP frameworks (countries are ordered by their scoring in the PPP indicator).

Source: Questionnaire on Infrastructure Investment.

Annex 2.

Coding of answers

Country	Indicator Value	Decision-Making F.	Independent Consulting	Ex-ante Evaluation	Ex-post Evaluation	Fiscal Implications	Minimising PPP Costs	Prevent Delays Overruns	Minimise and Transaction Costs	Output Ensuring VFM	Specifications	Min. Revenue	Revenue Share	Debt Limits	Arbitration	Review Clauses	Asset Price
AUS	3.5	1.5	0.0	0.0	6.0	0.0	6.0		6.0	3.0	0.0	6.0	6.0	0.0	0.0	3.0	6.0
AUT	1.4	1.5	0.0	0.0	0.0	6.0	0.0	0.0	0.0	2.6	3.0	6.0	0.0	0.0	0.0	3.0	6.0
BEL	1.8	2.0	6.0	0.0	0.0		0.0	0.0	0.0	3.4	6.0	6.0	0.0	6.0	0.0	0.0	6.0
CAN	1.9	0.0		0.0		0.0	4.0	4.0		1.7	0.0	6.0	6.0	0.0	0.0	0.0	0.0
CHE							6.0		6.0	6.0						6.0	
CZE	1.1	0.0	0.0	0.0	0.0	0.0	3.0	0.0	6.0	0.4	3.0	0.0	0.0	0.0	0.0	0.0	0.0
DEU	2.3	3.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	3.9	3.0	6.0	6.0	6.0	0.0	0.0	6.0
DNK							6.0	6.0									
ESP	4.1	4.5	6.0	0.0	6.0	6.0	4.0	2.0	6.0	3.9	0.0	6.0	6.0	6.0	6.0	3.0	0.0
FRA	2.3	1.5	0.0	0.0	6.0	0.0	4.0	2.0	6.0	1.5	3.0	0.0	6.0	0.0	0.0		0.0
HUN	3.0	3.0	3.0	0.0	6.0		3.0	0.0	6.0	3.0	3.0	6.0	6.0	0.0	0.0	6.0	0.0
IRL	1.8	4.5	6.0	0.0	6.0	6.0	0.0	0.0	0.0	0.9	3.0	0.0	0.0	0.0	0.0	3.0	0.0
ITA	2.8	3.0	6.0	0.0	6.0	0.0	4.5	3.0	6.0	0.9	3.0	0.0	0.0	0.0	0.0	3.0	0.0
JPN	3.8	1.5	0.0	0.0	6.0	0.0	6.0		6.0	4.0	0.0	6.0	6.0	0.0	6.0		6.0
KOR	2.2	3.0	3.0				3.0	0.0	6.0	0.5	3.0	0.0	0.0	0.0	0.0		0.0
LUX							4.5	3.0	6.0								
MEX	2.3	1.5	0.0	0.0	6.0	0.0	4.5	3.0	6.0	0.9	3.0	0.0	0.0	0.0	0.0	3.0	0.0
NLD		6.0	6.0				6.0	6.0	6.0								
NOR	4.3	6.0	6.0	6.0	6.0	6.0	3.0	0.0	6.0	3.9	3.0	6.0	6.0	0.0	6.0	0.0	6.0
PRT	1.8	1.5	3.0	0.0			3.0	3.0	3.0	0.9	3.0	0.0	0.0	0.0	0.0	3.0	0.0
SVK	4.5	4.5	6.0	0.0	6.0	6.0	3.0	0.0	6.0	6.0						6.0	
TUR	4.4	4.5	6.0	6.0	6.0	0.0	6.0		6.0	2.6	3.0	6.0	0.0	0.0	0.0	3.0	6.0
USA	3.6	1.5	3.0	0.0			6.0		6.0	3.4	3.0	6.0	6.0	0.0	0.0	3.0	6.0

Source: Questionnaire on Infrastructure Investment.

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