



WIP-Working Paper

No. 2010-03

Rationales for the (Limited) Use of Private Finance in Public-Private Partnerships

Thorsten Beckers

Jirka Gehrt

Jan Peter Klatt

**Workgroup for Infrastructure Policy (WIP)
at Berlin Institute of Technology (TU Berlin)
www.wip.tu-berlin.de**

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by

Thorsten Beckers^{*}

Jirka Gehrt[†]

Jan Peter Klatt[‡]

Abstract

In infrastructure sectors, public-private partnerships (PPPs) – defined as the provision of a service including several tasks by one private contractor within a long-term contract – are increasingly being used as a procurement option by public authorities in Europe and elsewhere. Private provision of capital required to finance the infrastructure facility is typically part of the service tendered. Private finance in PPP projects, especially its rationale(s) and optimum volume, are analyzed in this paper. While pre-financing the asset when the government is debt-constrained is rejected as an appropriate motive, private capital should be used for cost-efficiency reasons due to its safeguarding and incentive characteristics. The optimal amount of private financing can be derived by trading off stronger incentives for appropriate service provision against the higher cost of risk-bearing in case risk is transferred to the private contractor. Under certain conditions, procurement costs can be further reduced if private capital is released at certain dates during the contract term depending on the results of an asset-quality test undertaken by the authority (“monitoring”). Empirical evidence suggests that private financing volumes required by authorities in PPP projects are not designed to optimize public sector’s procurement costs. In contrast to many official guidelines, private finance seems to be often used to achieve pre-financing goals.

Keywords: public-private partnerships, private financing, risk allocation, cost-efficiency, contract enforcement

JEL: D86, G32, H54, H57

^{*} Workgroup for Infrastructure Policy, Berlin Institute of Technology, tb@wip.tu-berlin.de.

[†] Workgroup for Infrastructure Policy, Berlin Institute of Technology, jg@wip.tu-berlin.de.

[‡] Workgroup for Infrastructure Policy, Berlin Institute of Technology, jpk@wip.tu-berlin.de.

1) Introduction

Internationally, a growing number of public authorities are using so-called public-private partnerships (PPP) for infrastructure projects. PPP is a procurement option in which the public authority purchases a service from one private firm. For this purpose, several tasks relating to service provision, i.e. planning, construction, maintenance, and operation of the facility, are bundled in a long-term contract.¹ The contract term is usually between 20 and 35 years. These characteristics contrast with the conventional approach to public procurement in which the tasks are contracted separately in short-term contracts or provided in-house by the relevant agency or a public enterprise.

The fundamental rationale for using PPP as an alternative procurement approach to provide public services should be its efficiency, in particular the reduction of procurement costs to the authority, i.e. cost-efficiency. The basic objective for the application of the PPP approach, therefore, should be the optimization of lifecycle costs through the purchase of a service and the incentivization of the contractor by transferring cost risks. This major difference to conventional procurement has been widely discussed in literature.² However, there are only very few accounts of another major difference – the extensive use of private finance in many PPP projects.³ PPP projects usually require a huge investment at the beginning of the project, which is used for the construction of a new infrastructure facility. Besides, projects with major extensions or rehabilitations of existing assets are common. These initial investments are mainly financed by the contractor and (outside) private capital providers. Since the contractor bears cost risks from the project and capital providers may participate in negative realizations, private financings costs include a premium covering expected losses from the project and private parties' costs of risk-bearing. Therefore, private capital is more expensive than direct public debt. The major goal of this paper is to discuss the rationale for the use of private capital in PPPs by examining its impact on cost-efficiency. Based on this analysis, recommendations for the optimal design of the finance scheme in PPP projects are derived and then compared to approaches in different European countries.

For the analysis, we assume that a project finance structure is used for financing the infrastructure facility. In project financing, a special purpose company is established for the project and funded by its shareholders as well as directly by external debt providers. Empirically, project finance is the dominant form of private capital provision in PPP projects. However, similar effects can be achieved by

¹ For similar definitions, see BENTZ / GROUT / HALONEN (2004, p. 3) or DE BETTIGNIES / ROSS (2004).

² For example, see BENNETT / IOSSA (2006), BENTZ / GROUT / HALONEN (2004), HART (2003) and QUIGGIN (2004).

³ The lack of attention academic literature has given to details is highlighted by DE BETTIGNIES / ROSS (2007) who develop a model of private finance based on the assumption that private finance forces better termination decisions. Qualitative analyses of the role of private finance in PPPs can be found in GROUT (1997), SPACKMAN (2002), and DEWATRIPONT / LEGROS (2005).

corporate finance or financial guarantees. Potential differences among these instruments from authorities' point of view are beyond the scope of this paper.⁴

The paper is structured as follows: Section 2 discusses the relationship between the contractor compensation scheme and the need for private financing as well as possible motivations for using private finance in PPP projects. In section 3, we analyze the impact of private finance on the cost-efficiency of PPP projects. We discuss its role in enforcing the contractual risk allocation and its effects on the costs of service provision to the public authority. Based on this argument, in section 4, the prospects and limits of a substitute device for private capital are examined – monitoring by the public authority in connection with either the right to intervene with service provision or the privilege to release capital committed to the project. In section 5, the results derived from the analysis are confronted with empirical evidence which has been collected in interviews with market participants from selected European countries and from surveys of relevant publications. Section 6 concludes.

2) Private finance in PPPs

2.1) Contractor compensation and need for private financing

The need for private financing in PPPs results from the difference between the contractor's cash outflows for project implementation and cash inflows from the compensation. Outflows consist of payments for the investment required at the beginning of the project as well as the costs of operation and maintenance during the contract term.⁵ The contractor's cash inflows can be devised by the procuring authority through the design of the compensation scheme. Different compensation models are used in practice. Among other approaches remuneration models can be classified according to (i) the source of the compensation (public budget vs. users of the infrastructure facility) and (ii) the relation to the usage of the asset (usage-related compensation vs. payment conditional upon the availability of the infrastructure). In this paper, the focus is on availability payments from the public budget since many basic arguments are similar across alternative compensation schemes and discussion is simplified when focusing on this type of compensation.⁶

When devising a compensation scheme based on the availability of the project facility, the procuring authority may combine several of the following design parameters. First, the authority may vary regular payments made throughout the contract term. These payments are often called unitary charges. Second, larger payments may be made at dates specified in the initial contract. For example, there may be an initial payment upon the operational availability of the infrastructure. Furthermore,

⁴ Whereas the purpose of this paper is to establish the role of private finance, the evaluation of financial structures using the financial instruments mentioned above is analyzed in BECKERS / GEHRT / KLATT (2010).

⁵ Cash flows due to financial operations, e.g. dividends and interest payments, are not included in this list since they have to be incurred only when there is a need for private financing.

⁶ For example, additional objectives for the use of private finance need to be examined when including direct user charges in the discussion.

compensation may be paid at contract expiration (“final payment”) or at some dates during the contract term (“interim payment”). Possible combinations of these design parameters as well as the resulting need for private capital are shown in figure 1.

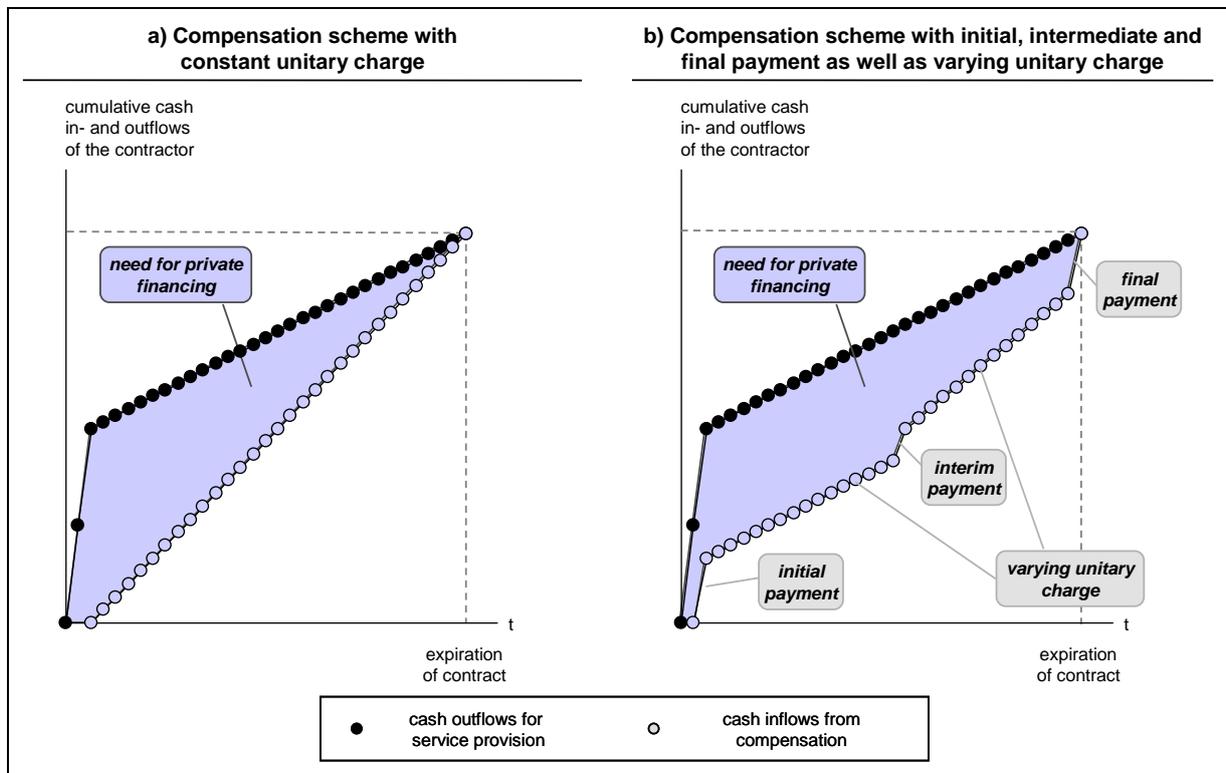


Figure 1. Relation between compensation schemes and the need for private financing in PPP projects⁷

2.2) Objectives of private finance in PPPs

Two major objectives for the use of private finance have been discussed in academic literature as well as by practitioners: (i) mobilization of private funds for pre-financing the asset, and (ii) effects on cost-efficiency.

Regarding the first objective, it is obvious that a greater number of projects can be realized in the short term by using private finance for pre-financing. If the public authority is credit-constrained by some external government debt limit, projects may be realized earlier than with conventional procurement of the asset (and financing from the budget) when a high proportion of private funds is used. However, if the contractor compensation is paid directly from the public budget, private financing indirectly increases public debt. Even if budgetary rules do not consider privately financed projects as public

⁷ The figure represents only cash flows from service provision, i.e. contractor outflows for planning, constructing, operating and maintaining the asset as well as corresponding compensation. Cash flows from financial operations, e.g. dividends, interest payments and corresponding compensation, are not shown. However, if considered, similar results would be obtained.

assets, the payment obligations for servicing the (private) loan in the future are similar to liabilities arising from issuing public debt. As a matter of principle, such bypassing of a fundamental rationale of budgetary rules should be avoided.⁸ Rather, definite government obligations for servicing loans from privately financed projects should be accounted for in budgetary rules in a way comparable to a public debt commitment.⁹ Otherwise, budgetary restrictions would be diluted. Such rules have a (political-economy) justification since they force politicians to limit expenses which would result in long-term costs to taxpayers, but may be well beyond decision-makers' potentially short-term time horizon. Furthermore, rules which permit bypassing of the rationale of budgetary rules may establish (wrong) incentives for using the PPP approach, even in cases where this is more costly than conventional procurement.¹⁰ Therefore, the relevant authority should first decide whether or not they can basically afford the project in the long term independent of the procurement option. Afterwards, the procurement option should be chosen solely on considerations of cost-efficiency.

As pre-financing should not be a reason for the inclusion of private capital in a PPP project the following analysis focuses on the second possible objective of private finance in PPPs: its impact on cost-efficiency.

3) Effects of private finance on cost-efficiency

3.1) Risk allocation in PPPs

Among other things, the PPP contract allocates the risks from service provision to the different parties of the agreement, primarily the contractor and the responsible public authority.¹¹ This assignment determines which party has to bear the effects of the outcome of each particular risky variable. For a cost-efficient allocation of risks, some crucial insights from principal-agent theory should be applied.¹² This approach emphasizes the basic trade-off between risk costs and incentive effects which is also relevant to PPP contracts:¹³ On the one hand, private contractors are typically more risk-averse than public authorities, because of lower diversification among projects and lower spreading of risks among

⁸ See, for example, NEWBERY / SANTOS (1999, pp. 124-125) and VINING / BOARDMAN (2008, pp. 12-13).

⁹ Private financing of projects that are funded primarily from earmarked user charges, have no effect on public debt. Therefore, there are no (wrong) incentives for bypassing budget rules here. Rather, private financing in user-funded schemes may be used to incentivize the bidders to evaluate the profitability of the project, i.e. whether the willingness to pay for the service exceeds the costs of its provision. Thus, investment decisions for infrastructure projects may be improved; see ENGEL / FISCHER / GALETOVIC (2008).

¹⁰ See ALLEN (2001, pp. 19-25) and SPACKMAN (2002, p. 298).

¹¹ For approaches to the classification of risks in PPP projects, see SMITH (1997, pp. 46-54) and ESTACHE / ROMERO / STRONG (2000, pp. 16-23).

¹² For an application of this theory to public procurement, see MCAFEE / McMILLAN (1988).

¹³ See GLAISTER (1999, p. 30).

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financiers.¹⁴ Hence, the costs to the public authority increase with a higher degree of risk transfer to the contractor, since potential contractors will factor these higher risks costs into their bids. With a transfer of (cost) risks, on the other hand, the contractor experiences the effects of his efforts to reduce negative outcomes of particular risks directly and, consequently, has an incentive to optimize these efforts. Consequently, moral hazard problems during the contractual relationship and – with adequate awarding procedures – costs to the public authority can be reduced by transferring (cost) risks to the contractor.

For an optimal risk allocation between contractor and public authority, these effects have to be balanced. As a rule-of-thumb it can be stated that more risk should be transferred to the contractor if he is better able to control the outcome. Nonetheless, this trade-off would typically result in risk-bearing being shared between the two parties. However, other effects have to be taken into account as well. More specifically, transaction costs, e.g. resulting from measurement problems, may favor a solution where only one of the parties bears a particular risk.¹⁵ Based on these arguments, it seems plausible to allocate cost risks relating to service provision primarily to the contractor. In this way, PPP projects feature fixed-price contracts with contractually defined service standards. Furthermore, by collectively transferring the cost risks relating to the construction, maintenance, and operation of the asset, incentives for the optimization of the lifecycle costs can be established by using the PPP approach.¹⁶

Nonetheless, it might be efficient to share or cap some cost risks in PPP projects. This may be the case with risks over which the contractor has low control and where measurement problems are limited. In this case, risk-sharing or even risk-bearing by the authority is possible at low transaction costs. For example, it is reasonable that the public authority bear inflation risks in PPP projects since there are no or very limited incentive effects from a risk transfer while measurement is not that problematic. In practice, accordingly, inflation risks are typically borne by the authority.

¹⁴ For the basic arguments relating to better diversification and spreading of risk in the public sector, see VICKREY (1964) and ARROW / LIND (1970). QUIGGIN (2005a) and SPACKMAN (2002, p. 298) show that not just the bearing of specific risk but also of systematic risk causes lower costs in the public sector than in the private sector. Exceptions regarding lower costs of risk-bearing may apply for small municipalities; see MCAFEE / McMILLAN (1988).

¹⁵ For the effects of transaction costs on risk allocation, see GOLDBERG (1985) and CROCKER / MASTEN (1991). Further considerations include the effect of risk allocation on competitive pressure during the bidding stage and incentives for distorted bids; see MCAFEE / McMILLAN (1988) and ATHEY / LEVIN (2001), respectively.

¹⁶ See HART (2003) and QUIGGIN (2004).

3.2) Private finance as safeguarding and incentive device

Different devices can be used to enforce risk allocation during the contract term. For example, contracts might be enforced by courts. However, this can be very costly for the parties to the contract.¹⁷ First, valid claims may not be enforceable because of incomplete contractual provisions. Second, court resolution may cause substantial (transaction) costs. Finally, the contractor may limit his liability by establishing a special purpose company for the project with minimum capital. Such a vehicle may be pushed into bankruptcy whenever there is a significant negative realization of a particular risk which is not compensated by some positive option value from future project cash flows.¹⁸

As enforcement through courts is difficult, it may be more cost-efficient to use “collateral” to facilitate exchange.¹⁹ Collateral is a valuable asset that the principal of the exchange may liquidate if the agent does not perform as specified in the contract. For example, the public authority may require that the contractor provides a performance bond or another financial guarantee by some guarantor with a high credit-standing which can be called upon in case of defective performance. One possibility with similar effects – and the focus of this paper – is to decouple compensation payments from the contractor’s cash outflows for service provision. As shown in section 2, withholding compensation by the authority results in a need for the contractor to raise (private) finance.

With private financing, negative realizations of project risks are not directly borne by the public authority but initially by the contractor and his capital providers. For example, increased construction costs will not immediately cause the capital providers to abandon the project. Rather, the value of the project to the capital providers is determined by the value of prospective future cash flows from the project which is c. p. greater the more compensation is retained by the public authority. Therefore, outstanding capital is a threshold which determines the cumulated value of negative risk realizations that are borne by the contractor and his capital providers. As private financiers have an incentive to limit their exposure to risk, they will monitor the contractor’s service provision.²⁰ This incentive is the higher, the more capital is at risk.

Summarizing, the provision of private capital has a safeguarding function for the public authority as well as an incentive effect on the contractor and his capital providers.

¹⁷ See WILLIAMSON (1983).

¹⁸ For further discussion, it is assumed that the contractor limits his liability. This simplifies the following analysis.

¹⁹ See KRONMAN (1985), and similar WILLIAMSON (1983).

²⁰ See ASENOVA / BECK (2003).

3.3) Cost effects of different safeguarding strategies

Having recognized the safeguarding and incentive function of private capital, it remains to be determined which amount of private capital is appropriate to achieve the lowest cost of service provision. This is synonymous to the question what degree of protection against project damages should be chosen by the public authority. The analysis starts with a discussion of the two polar opposites, i.e. full protection against all possible damages from the project on the one hand, and waiver of any protection against damage from the project on the other. Afterwards, potential intermediate solutions are discussed.

POLAR SOLUTIONS: FULL PROTECTION VERSUS NO PROTECTION

When choosing full protection, the authority has to design a compensation scheme in a way that all theoretically possible damages from the project are borne by the contractor and his capital providers, i.e. all potential negative realizations of cost risks have to be covered. Thus, the need for private capital may exceed the investment volume at the beginning of the project, e.g. because possible secondary losses have to be accounted for. To cover such losses, the contractor may be obliged to deposit excess capital in an escrow account. A compensation scheme assuming constant maximum damages throughout the contract term is shown in part a) of figure 2. In the bidding stage, the potential contractors will factor financing costs into their bids. These include three basic elements: First, the risk-free interest rate is included in the bid to account for the present value of future cash payments. Second, capital providers and, consequently, the potential contractors consider the costs of expected losses from outstanding capital and interest payments in their bid. Third, because of the private actors' risk aversion, capital providers will charge a premium for risk-bearing. Besides, transaction costs for structuring the venture and monitoring contractor performance will be factored into the bid.

If the authority decides to have no protection from private capital, the compensation scheme is based on an assessment taking place as soon as relevant costs are incurred by the contractor. Payments are made to coincide with contractor's scheduled cash outflows for service provision. Consequently, there is no or only a low need for private financing. A corresponding compensation scheme is shown in part b) of figure 2. Assuming that the public authority raises debt for financing the project in capital markets, the following three cost components need to be considered in a comparison with the full-protection alternative:²¹ First, the costs of gilts that are issued to fund the project can be assumed to replicate the risk-free rate. Second, losses from the project are directly borne by the authority and, in consequence, by the taxpayer. This is because the contractor will abandon the project with each significant negative realization from project risk. Third, potential risk costs of the authority need to be considered.

²¹ Similar results can be derived for the case of funding the investment from current tax revenues.

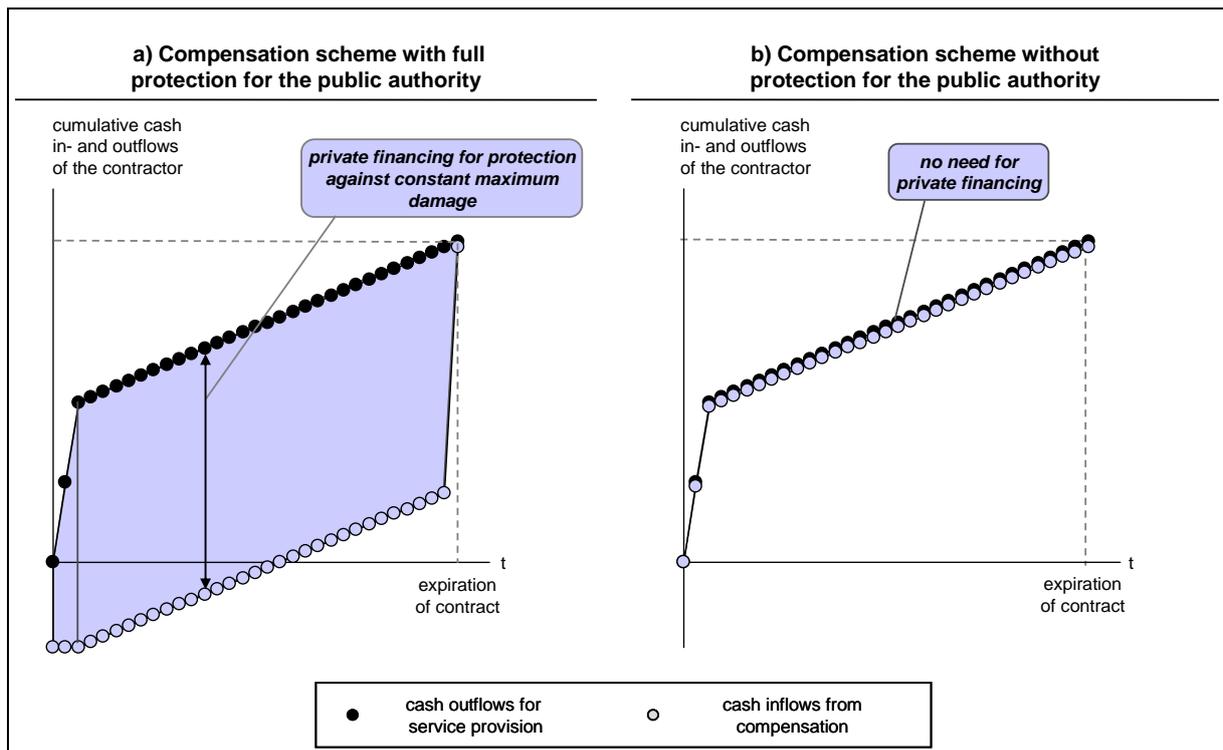


Figure 2. Compensation schemes with full and no protection²²

COST COMPARISON AND PARTIAL PROTECTION AS OPTIMAL SOLUTION

The risk-free interest rate has to be incurred for the entire investment volume in the two extreme solutions as well as in all intermediate ones. Therefore, it can be ignored in the further discussion. When comparing the two opposite scenarios – not considering potential differences in transaction costs – two essential differences can be observed. First, the public authority benefits from lower cost of risk-bearing when limiting risk for private capital providers. Second, with higher risk transfer, capital providers have better incentives to avoid (expected) losses, e.g. through influencing the structure of the project before financial close as well as through monitoring contractor performance during the contract term. Balancing these effects – principal-agent theory's familiar trade-off between incentives and costs of risk-bearing – will yield an optimal degree of protection. For a wide range of possible parameters, this will result in a financing structure in which the public authority is only partially protected against damages from the project.²³

Based on this discussion, the authority needs to estimate the appropriate level of protection for each point in time during the contract term before tendering the project. For this purpose, relevant risks have to be identified and assessed. Ideally, a probability distribution of important risks is derived and

²² Again, the figure presents only cash flows from service provision; cash flows from financial operations are neglected.

²³ With a similar argument for the use of private finance as a tool for improving investment decisions in the public sector, ENGEL / FISCHER / GALETOVIC (2008) propose minimum income guarantees that provide partial protection against losses from the project for the contractor.

simulated. However, with only limited information about important risks, an estimation of relevant losses from the project, compared to the project's originally estimated value, combined with a rough assessment of probability of occurrence may be sufficient. Influencing factors for an adequate risk assessment are the (technological) characteristics of the sector and of the project itself as well as the contractual risk allocation used.

An important project feature, for which possible developments should be analyzed when determining the private finance requirement, is the so-called structural quality of the facility. Structural asset quality can be defined as the quality dimension which describes the inherent value of the facility. It may not be experienced by users (in the short term), but determines re-investment need in the (expected) useful life of the asset. In many infrastructure sectors, facilities can only be used by the public sector. Furthermore, the useful economic life of many assets considerably exceeds the typical durations of PPP projects and, hence, assets are frequently returned to public sector after the contract expires. If the facility's structural quality does not meet agreed standards at the end of the contract, the authority has to incur increased costs for the maintenance of the facility or its rehabilitation. Since the respective costs may be substantial, the contractor needs to be incentivized to return the facility in proper structural quality. For example, a final payment to the contractor could be made contingent on meeting agreed structural quality standards. Consequently, a considerable volume of private capital may be required until contract expiry.

During the contract term, the same problem is relevant since the contractor may abandon the project if re-investment need during the remainder of the contract is much higher than outstanding compensation payments. With postponing compensation and the resulting need for private finance, incentives for adequate maintenance of the asset's structural quality increase. Furthermore, the authority may require a (voluntary) termination at each point in time during the contract term.²⁴ Like the provisions for the normal expiry of the contract, clauses governing contractor's termination compensation should take the asset's structural quality into account. Hence, the use of private capital is reasonable in each point in time during the contract term. Private capital requirement should be estimated considering possible developments of structural asset quality. Based on this information, the authority has to derive an appropriate compensation scheme using the design parameters discussed above, i.e. unitary charge as well as initial, interim and final payments.

4) Monitoring by the authority

Contributions from corporate finance literature highlight that contracting parties in financing relationships use several instruments to achieve appropriate performance.²⁵ For example, banks may use collateral requirements as well as monitoring in connection with intervention rights in (corporate)

²⁴ For advantages of principal's (voluntary) termination rights in long-term contracts, see GOETZ / SCOTT (1981, p. 1142). For a similar argument regarding PPP projects, see QUIGGIN (2005b).

²⁵ See JENSEN / MECKLING (1976) who propose that contracting parties attempt to minimize the sum of bonding costs (i.e. costs of the agent), monitoring costs (i.e. costs of the principal) and residual loss.

loan contracts to ensure full debt service.²⁶ Based on this fundamental idea, costs accruing to the authority from project delivery may be lowered if private capital (as collateral) is (partly) substituted by an authority monitoring privilege combined with intervention rights. For example, the contracting parties may agree that the authority is entitled to enforce specific actions on the part of the contractor if he does not comply with quality parameters defined in the contract. However, this may result in problems after the actions have been implemented. In any future disagreement regarding project performance, the contractor may argue that the problem can be traced back to the authority's intervention resulting in disputes and corresponding transaction costs. Furthermore, this method contradicts the output-oriented approach of PPPs in which it is the contractor's duty to optimize across different tasks within the limits of the contractual incentive regime.

There is, however, another way to implement a monitoring scheme. It may be agreed that contractually defined parameters, e.g. measures for the asset's structural quality, are tested on a regular basis. Depending on the result of the test, private capital requirement is adjusted. For instance, capital might be released with a positive result of the test, e.g. through an interim payment as shown in part b) of figure 1.²⁷ As opposed to direct intervention rights of the authority, this mechanism is consistent with the output-oriented PPP approach where capital is used to enforce the contractual risk allocation and the contractor can choose among various strategies to optimize the cost of service provision. From the authority's point of view, the application of this method is beneficial if it reduces overall costs, i.e. if the reductions in financing costs exceed the monitoring expenses that need to be incurred for internal staff or for hiring a qualified (technical) adviser, respectively. As to financing costs, several effects have to be taken into account: First, expected losses and, hence, incentives will decrease only slightly if capital is reduced only in the case of appropriate structural quality. Second, reductions in risk costs are limited as well since only extreme realizations are not borne by the contractor and his capital providers after the capital release. Therefore, in perfect capital markets, the decrease of financing costs appears to be limited. However, assuming imperfect capital markets, it is plausible that financing costs decrease with a reduction of outstanding capital. In this case, the decrease in financing costs may outweigh the additional costs from monitoring.

Based on this discussion, prerequisites for the implementation of the monitoring approach can be derived. For example, certain technological conditions, depending on the sector and individual project characteristics, have to be met. Among other things, the development of the asset's structural quality should be sufficiently well predictable. Furthermore, structural quality must be measurable at relatively low (transaction) costs. Finally, the respective measures have to be translatable into cost estimates for the restoration of agreed standards if realizations deviate from this level so that potential damages can be assessed.

²⁶ For a discussion, see MANOVE / PADILLA / PAGANO (2001).

²⁷ An analogous argument can be derived for additional capital requirements in the event of a negative test result. However, in this case the contractor may not be able to raise additional capital. Then, the authority cannot enforce additional protection. Therefore, the alternative of capital release after a positive test result is preferable because it provides a credible threat.

Beside technological issues, the responsible public authority needs to fulfill some requirements if this monitoring scheme is to be implemented. For instance, there is a need for sufficient know-how within the agency or a sufficient budget for hiring external consultants, respectively, to undertake measurements. Long-term commitment problems in the public sector may favor a solution in which the contractor bears the costs for an external technical expert. However, in this case the independence of the external advisor needs to be ensured. Finally – as in the determination of proper levels of private financing – authorities must resist pressures to reduce capital requirements at monitoring dates.

5) Empirical evidence from selected European countries

Approaches to private finance in real-life projects seem to differ significantly from the normative discussions of the previous sections. Below, indications as to the actual motivations for using private finance are presented. Furthermore, approaches regarding the volume of private finance used in practice are discussed. These findings are based on interviews with public and private sector officials responsible for projects and other market participants in the respective countries as well as on a survey of publications which deal with the problems analyzed here.

MOTIVATIONS FOR THE USE OF PRIVATE FINANCE IN PPP PROJECTS

Despite the arguments against pre-financing using the PPP approach, bypassing of government debt limits seems to be a major motivation for the use of private finance. For example, this was the first goal of the so-called Private Finance Initiative (PFI) in the United Kingdom. This policy had many critics, and eventually the official motivation for using the PPP approach evolved to the second objective discussed above.²⁸ Now cost-efficiency, labeled “value for money” in official guidelines, is promoted as the primary goal when choosing this procurement option.²⁹ Although similar provisions can be found in official PPP guidance across European countries, pre-financing seems to remain a dominant motive with the relevant authorities.³⁰ For example, contributions analyzing UK experiences highlight that central government funds are often only available if (local) decision-makers take the PPP route.³¹ This results in distorted incentives for the selection of a procurement approach when funds are limited at the local level. Furthermore, budgetary goals were quoted as a primary purpose for choosing the PPP approach in 56 % of the responses in a survey among public servants involved in German municipal PPP projects.³²

DESIGN OF PRIVATE FINANCE REQUIREMENT

²⁸ For a discussion of pre-financing incentives in the UK, see GROUT (1997), ALLEN (2001), SPACKMAN (2002), and QUIGGIN (2004).

²⁹ See HM TREASURY (2003, p. 2).

³⁰ See, for example, guidelines for Denmark in ERHVERVS- OG BOLIGSTYRELSEN (2004), for Germany in PRICEWATERHOUSECOOPERS ET AL. (2003a and 2003b) and for Ireland in IRELAND'S CENTRAL PPP UNIT (2006).

³¹ See HEALD (2003) and QUIGGIN (2004).

³² See DIFU (2008, pp. 15-16).

Regarding the volume of private financing in PPP projects, different approaches have been used. In the UK, the safeguarding and incentive effects of private finance are stressed in official guidelines as well as in other documents relating to the PPP policy and its implementation.³³ However, there is no account which discusses the proper volume of private finance during the contract term. Presumably, this leads to private financing of the whole investment volume at operational start and the adoption of a somewhat linear compensation scheme (like in part a) of figure 1) which may result in an inefficiently high degree of protection during the first years of the project and comparatively low incentives for appropriate service provision in the last years of the contract term if no other instruments are used to tackle the problem. In recent years, however, it can be observed that authorities require compensation withholding rights as well as financial guarantees that have to be provided by contractors in the last years of the contract. In some cases, such provisions are contingent on meeting certain parameters which provide a measure for the asset's structural quality. Outcomes of these different designs cannot be observed yet as the first PFI projects are only in years 10 to 15 of their typically 20 to 35-year contract duration.

Similar approaches to the volume of private finance have been used, for example, in Norwegian, Austrian, and Dutch PPP road projects. However, different conclusions have been drawn from the experience. While the responsible Norwegian authority still hold that 100 % private financing of the initial investment is beneficial, the relevant agencies in Austria and the Netherlands announced their intention to reduce the private capital share in future projects, which is consistent with our results.

Other schemes are being applied in Germany. In recent highway projects, the so called "A-models", undertaken by the central government in co-operation with the respective federal state, the authority's start-up financing and, hence, the necessary amount of private capital was used as a bidding variable. Apart from start-up financing, the major share of the contractor's remuneration is based on shadow tolls for HGV. Potential contractors bid for the lowest possible start-up financing, taking into consideration their expectations of heavy traffic levels during the contract duration. Considerations of cost-efficient safeguarding and incentivization levels played no (major) role. In most German municipal PPP projects (mainly schools and public administration buildings), private risk capital or substitutes with similar effects are being used only to a very limited extent.

6) Conclusions

In this paper, we have discussed private financing in PPP projects for infrastructure, i.e. its rationale as well as its most cost-efficient volume. The use of private capital for pre-financing purposes should be rejected. In projects with availability payments from the public budget, the main justification is private capital's effect on cost-efficiency. As a safeguarding and incentive device, private capital ensures enforcement of the contractual risk allocation and, with this, may reduce overall costs of project

³³ For general descriptions of the UK government's position towards private finance, see HM TREASURY (2003, pp. 105-112) and HM TREASURY (2006, pp. 107-121). For an application in financing investments for service variations, see HM TREASURY (2007, p. 91).

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delivery. Trading off incentive effects and costs of risk transfer, the optimal amount of private capital typically does not protect against any possible damage resulting from the project. Rather, some extreme, but unlikely realizations of project risks are borne by the authority. With optimal use of the private capital, we would expect a switch from compensation schemes with initially 100% private finance and a constant unitary charge, as shown in part a) of figure 1, to a suitable mix of compensation parameters as shown in part b) of this figure. Initial, interim and final payments may be made contingent on meeting standards regarding structural quality. However, this monitoring mechanism is viable only for projects in selected sectors since measurement problems may hamper implementation. Furthermore, transaction cost considerations restrict the application of this approach to a limited number of dates during the contract term.

Overall, we would expect lower levels of private finance in PPP projects on average if private capital were just used for safeguarding and incentive purposes since marginal incentive effects are presumably high with low levels of private finance involved but decrease significantly with medium and high levels. If this is the case and contractors have a relatively high degree of autonomy in designing the financing structure of a project, we would furthermore anticipate a less frequent use of project financing (as compared to corporate loans and financial guarantees based on the credit quality of the sponsors) and fewer project bonds (as compared to bank loans) since transaction costs for setting up these financial instruments are supposed to be high. Furthermore, the current financial crisis has effects on the optimal level of private finance. In recent months, the costs of private capital have been rocketing. Since the efficiency considerations discussed here depend heavily on the costs of the respective instrument and its alternatives, we may conclude that optimal volumes of private finance decrease as compared to pre-crisis levels.

Although the discussion was focused on PPP projects, the results derived may be applied to other procurement schemes in the public sector, but also to contracts between private parties only.

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