



**WIP-Working Paper**

**No. 2010-04**

# **Evaluation of Private Financing Structures 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](http://www.wip.tu-berlin.de)**

# Evaluation of Private Financing Structures in Public-Private Partnerships

by

Thorsten Beckers<sup>\*</sup>

Jirka Gehrt<sup>†</sup>

Jan Peter Klatt<sup>‡</sup>

## Abstract

Private financing in public procurement in general and in PPP projects in particular can be justified because it may achieve enforcement of contract provisions at lower costs as compared with alternative methods, e.g. taking recourse to courts. However, financial instruments potentially used in PPPs have different features regarding contractual financing costs and qualitative aspects that may influence long-term costs of service provision in PPP projects. The focus of this paper is the discussion of such differences and their evaluation from the authority's point of view. Based on contract theory and consistent with empirical evidence, it is shown that project financing structures will be used in infrastructure projects particularly if the authority requires a high amount of private financing. Furthermore, flexibility is highlighted as the one qualitative feature of financial instruments that can significantly influence costs to public authorities' resulting from any project. All other qualitative differences among financial instruments are either irrelevant to the public authority or can be reduced, e.g. by using specific contractual rules. Apart from the above-mentioned criteria, bidders should have freedom in choosing the appropriate instruments in achieving the authority's requirements.

JEL Codes: D86, G32, H54, H57

Keywords: public-private partnerships, financial structures, project finance, corporate finance, long term contracts, bid evaluation

---

<sup>\*</sup> Workgroup for Infrastructure Policy, Berlin Institute of Technology, tb@wip.tu-berlin.de.

<sup>†</sup> Workgroup for Infrastructure Policy, Berlin Institute of Technology, jg@wip.tu-berlin.de.

<sup>‡</sup> Workgroup for Infrastructure Policy, Berlin Institute of Technology, jpk@wip.tu-berlin.de.

# 1) Introduction

Internationally, a growing number of public authorities are using public-private partnerships (PPPs) as a procurement option. The main characteristic of the PPP approach is the bundling of tasks relating to the provision of an infrastructure facility, i.e. planning, construction, maintenance, and operation, in a long-term contract (e.g. 20 or 30 years) with one private contractor.<sup>1</sup> 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. With the transfer of cost risks to the contractor (by stipulating a fixed price for the tasks agreed upon in the original contract) and bundling of tasks in a PPP project, incentives for the optimization of lifecycle costs can be established.<sup>2</sup> However, a general conclusion regarding the effect on authority's total costs resulting from a PPP project is not possible, as other effects, especially higher costs of risk bearing and transaction costs in PPPs, have to be taken into account as well.<sup>3</sup>

Another characteristic of the PPP approach is its heavy reliance on private capital for the delivery of projects, with typically high investment requirements at the beginning of the contract term. The capital is used for the development of a new infrastructure facility or for major rehabilitations as well as expansions of existing assets. Although a common motivation among public servants responsible for PPP projects, pre-financing of assets when the government is debt-constrained is not an economically sound practice. Allowing public authorities to use private finance for the implementation of a project while issuance of public debt is restricted would spoil basic rationales of budgetary rules. For example, a major objective of such rules is the limitation of the public sector's long-term liabilities. The possibility to bypass this rationale would dilute pressures on politicians to allocate scarce public resources appropriately. Furthermore, it may establish (wrong) incentives for using the PPP approach, even when this is more costly than conventional procurement.<sup>4</sup>

However, the use of private capital is justified if it enhances the cost-efficiency of the project, i.e. if it lowers (long-term) procurement costs to the public authority given a specification of the required performance standard.<sup>5</sup> Private financing may increase cost-efficiency through its safeguarding and incentive characteristics, i.e. private capital helps to enforce the risk allocation of the PPP contract.<sup>6</sup> To minimize procurement costs, incentives for adequate service provision need to be traded off against the higher costs of risk-taking in the private sector, which are reflected in the higher costs of private capital. Balancing these effects, it is typically efficient for the authority to choose partial protection from

---

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

<sup>2</sup> See HART (2003) and QUIGGIN (2004).

<sup>3</sup> See EDWARDS ET AL. (2004), QUIGGIN (2004), and VINING / BOARDMAN (2008).

<sup>4</sup> See ALLEN (2001) and SPACKMAN (2002).

<sup>5</sup> For a thorough discussion of the justification and the optimal volume of private finance in PPPs, see BECKERS / GEHRT / KLATT (2010a).

<sup>6</sup> For the safeguarding and incentive effects of capital as a collateral or hostage; see WILLIAMSON (1983) and KRONMAN (1985).

private capital against project damages. The optimal volume of private finance depends on characteristics of the sector concerned as well as the project itself.

In this paper, the focus of the analysis is not on the determination of the cost-efficient volume of private finance in general. Rather, we identify differences among financial structures and instruments that may have an effect on the total costs of a PPP project. Based on this analysis, we discuss, from the authority's point of view, which features of specific financing structures and instruments need to be considered in the tender specification and in the evaluation of financing structures in the individual bids of potential contractors, respectively. Although some authors have provided accounts of a number of individual private financing instruments in PPP projects, up-to-now there has been no comprehensive analysis taking the most commonly used instruments into consideration.<sup>7</sup>

This paper is structured as follows: In section 2, financial structures that are typically applied in PPP projects are presented and discussed as to their safeguarding and incentive characteristics. Furthermore, empirical evidence regarding the use of individual instruments is provided. In the following sections, these financial instruments are analyzed with regard to their cost effects. As a first step in section 3, private parties' optimization considerations are discussed. Assuming that potential contractors attempt to minimize contractual costs during bidding stage in order to win the contract, we try to explain why private bidders choose particular financing structures, basing our argument primarily on contract theory and its application to financial markets. However, there may be elements of financial instruments' costs that are not reflected in the bid price, e.g. because of contracting problems. Such (qualitative) aspects that may have an impact on the long-term cost-efficiency of the project are discussed in section 4, special attention being paid to the question whether specific differences among instruments should be taken into account by the authority in the tender specification or the bid evaluation. In section 5, empirical observations regarding the evaluation of private financing structures are presented. Evidence is taken from a survey of empirical literature as well as an analysis of guidelines, manuals and other documents published by relevant market participants. Analysis is focused on the UK and Germany, the former being a rather developed and the latter a more immature market for PPP projects, respectively.<sup>8</sup> Section 6 concludes.

---

<sup>7</sup> For contributions which analyze some financial instruments used in PPP projects, see SPACKMAN (2002) and DEWATRIPONT / LEGROS (2005).

<sup>8</sup> In the UK, PPP projects have already been used since the beginning of the 1990ies. Some 880 schemes with an estimated investment volume of GBP 76bn have been closed. In Germany, on the other hand, the PPP approach has been applied only since the late 1990ies. Up-to-now, contracts for some 100 projects with an investment volume of app. EUR 5bn have been signed; the analysis of project numbers and investment volumes is based on the PPP project databases of Partnerships UK (<http://www.partnershipsuk.org.uk> as of 26<sup>th</sup> of June 2008) as well as of the German Federal PPP task force (<http://www.ppp-projekt Datenbank.de> as of 20<sup>th</sup> of August 2008) and of the Hauptverband der Deutschen Bauindustrie (German Association of Construction Firms, <http://www.ppp-plattform.de> as of 20<sup>th</sup> of August 2008).

## 2) Financing instruments in PPPs

### **BASIC FINANCIAL STRUCTURES**

In PPP projects, three basic financing structures can be distinguished: (i) project finance, (ii) corporate finance, and (iii) the forfeiting model. These financing structures are described below.

As regards the first basic instrument, project financing is a financial structure in which a special purpose vehicle with limited liability is established and legally separated from other activities of the owner of the project.<sup>9</sup> Since the authority may withhold payments if contractual obligations are not met by the contractor, project finance structures have incentive and safeguarding characteristics. With the limitation of liability for the project company, however, the capital providers' exposure as well as the authority's protection is restricted to the value of outstanding capital.<sup>10</sup> Typically, external capital providers, in particular creditors, are heavily involved in the funding of the project. In archetypal project financing, there is no recourse to the owners. Therefore, financing is based solely on the merits of the individual project. As projected cash flows are the primary base for capital service, external capital providers protect their investments by imposing strict and detailed rules which limit management's activities. Therefore, project financing is referred to as "contractual finance".<sup>11</sup> Empirically, project finance is the dominating basic financial structure in the UK PPP market whereas there is comparatively little project financing in Germany.<sup>12</sup> In the latter market, it is particularly used for road projects and large-scale real estate schemes.

Second, in (traditional) corporate financing, there is no legal separation of the project.<sup>13</sup> The project is part of a larger company and administrated as a unit among other projects and departments. Outside financiers provide the company with capital on the basis of its overall financial strength, i.e. the composition of the assets and available collateral, the quality of the management etc., but not on the qualities of a single project. As in project financing, a corporate finance structure provides safeguarding and incentive effects. In contrast to project finance, the contractor's liability to the authority is not limited to the amount invested in the project. Beyond this threshold, the authority may attempt to enforce contract compliance by suing the contractor. However, contract enforcement by courts can be very costly as has been stressed by transaction cost theory.<sup>14</sup> Furthermore, the amount available for authority's protection beyond outstanding capital is usually unknown as the contractor's company may have no valuable assets outside the project. Finally, the contractor may limit his liability

---

<sup>9</sup> For descriptions of project financing, see BULJEVICH / PARK (1999) and ESTY (2004).

<sup>10</sup> The value of the outstanding capital in turn depends on the future payments from the contract. Hence, the authority is able to determine the volume available for protection against project damages when designing contractor's remuneration scheme and resulting needs for private financing during the project term.

<sup>11</sup> See ESTY / MEGGINSON (2003, p. 40).

<sup>12</sup> For the UK, see SPACKMAN (2002, p. 286) and BLANC-BRUDE / STRANGE (2007, p. 2). For Germany, see DAUBE / VOLLRATH / ALFEN (2008).

<sup>13</sup> For a comparison between corporate and project finance, see BULJEVICH / PARK (1999, pp. 126-8).

<sup>14</sup> See WILLIAMSON (1983) and KRONMAN (1985).

to an individual project in corporate finance as well. For example, there may be a contractual provision between contractor and authority which protects the contractor from claims beyond the provided capital. Additionally, the contractor may establish a special purpose vehicle with limited liability, which is financed exclusively from corporate funds. In this case, the company is isolated from risks in the project as it can push the subsidiary into bankruptcy if negative risk realizations exceed outstanding capital. If corporate financing is used, it is plausible that the contractor restricts his liability in one of these two ways, which, therefore, we felt justified in assuming for the sake of simplicity. In this case, corporate and project finance are comparable with regard to their safeguarding and incentive characteristics. In practice, corporate financing structures are applied in a limited number of projects.<sup>15</sup> In particular, contractors use this basic financial structure in the construction phase. In the UK, it is typically replaced by project financing after the facility has become available.

Financial guarantees, promising to cover possible damages from defective performance by the contractor, have similar safeguarding and incentive effects as has the provision of private capital through project or corporate finance. Coverage is typically limited to a specified amount. However, the protection effect of such guarantees is heavily dependent on the credit quality of the issuer and its development over time. Contractual rules between the authority and the contractor may stipulate that the guarantor has to maintain a certain credit quality, e.g. a minimum credit rating by a recognized rating agency. Nonetheless, there will be a residual risk with financial guarantees if the quality of the project and the creditworthiness of the guarantor deteriorate at the same time. Apart from this difference, financial guarantees are in many respects similar to project finance or corporate lending.<sup>16</sup> Therefore, this protection instrument is not discussed in this paper.

A third financing approach involving private provision of funds – the so-called forfeiting model – is used particularly in German municipal real estate projects.<sup>17</sup> In this model, the private contractor borrows from a bank and uses the funds to finance the investment. Simultaneously, the contractor sells his claims against the public authority for the investment, i.e. the corresponding contractual remuneration, to the financing bank. The public authority states by means of a waiver of objection that it will back the loan with its full faith and credit regardless of contractor's performance.<sup>18</sup> With this structure, the finance provider does not bear the risk of the project or of the sponsoring company, but can rely on the credit standing of the public authority. At the same time, due to the waiver of objection, privately provided capital loses its safeguarding and incentive characteristics. As these effects provide the primary justification for the use of private capital in PPP projects, the application of forfeiting structures

---

<sup>15</sup> For evidence in the UK, see HM TREASURY (2007, p. 295). For further evidence regarding continental Europe, see DLA PIPER (2006, p. 12).

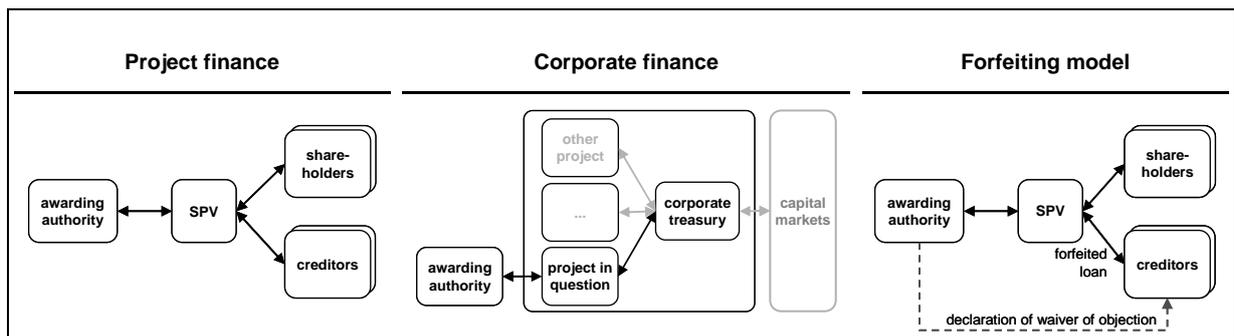
<sup>16</sup> Financial guarantees can be structured in two ways. First, they can be based on the quality of a single project and deliver, then, protection similar to project finance. Second, financial guarantees may be structured on the basis of the credit standing of the sponsoring company, which makes such instruments akin to corporate lending.

<sup>17</sup> See DAUBE / VOLLRATH / ALFEN (2008) who count 37 out of 51 projects as being financed using the forfeiting model, whereas 13 projects use project finance. However, there are indications that this model is also used in other countries, e.g. TORRES / PINA (2001, pp. 612-3) report a similar financing structure for Spanish projects.

<sup>18</sup> The waiver of objection is typically declared after the facility has become operational. In the construction stage, contractors commonly use corporate finance.

is, consequently, to be rejected. Beside this basic qualification, further objections against the forfeiting model can be raised. For example, because of associated transaction costs, forfeiting models are usually more expensive than comparable public loans. Furthermore, there are indications that the forfeiting model can be used to bypass government debt limits which should – as a matter of principle – be avoided. To summarize, forfeiting models lack economic justification. Therefore, they are excluded from further analysis in this paper, the discussion being focused on project and corporate finance only.

Structural differences of the three basic financing models are shown in figure 1.



**Figure 1. Basic financial structures used in PPP projects**

**DESIGN PARAMETERS IN PROJECT FINANCE**

Since project finance is in many cases the prevalent basic financial structure, its design parameters are presented as well. First, equity, (senior) debt and different forms of mezzanine capital can be distinguished. For the sake of simplicity, the latter instrument is ignored throughout this paper and analysis is focused on equity and (senior) debt. In practice, PPP project financing is typically heavily leveraged, i.e. equity is used to a limited extent.<sup>19</sup>

Secondly, shareholders of the project company, often called sponsors of the project, can be divided into two groups. On the one hand, sponsors are in many cases involved in the provision of the contracted tasks (as subcontractors of the project company).<sup>20</sup> We label the capital contribution of such investors “internal equity”. On the other hand, purely financial investors may act as sponsors of project companies, providing so-called “external equity”.<sup>21</sup>

Thirdly and lastly, different debt instruments are used in PPP project financing. Typically, banks provide loans to PPP project companies.<sup>22</sup> Besides, bonds are issued for some projects.<sup>23</sup> As opposed to the textbook form of this financial instrument, bonds for PPP projects are typically not publicly listed

<sup>19</sup> See BLANC-BRUDE / STRANGE (2007, p. 2) and 4Ps (2008, p. 3).

<sup>20</sup> See, e.g., 4Ps (2008, p. 5).

<sup>21</sup> See NAO (2006, p. 29) and 4Ps (2008, p. 20).

<sup>22</sup> See SPACKMAN (2002, p. 286) and BLANC-BRUDE / STRANGE (2007, p. 2).

<sup>23</sup> For evidence in the UK, see NAO (2006, p. 15).

on a stock exchange, but are often privately placed with a limited number of institutional investors.<sup>24</sup> The characteristics of typical PPP bonds are, therefore, somewhere between typical bank loans and the textbook type of this financial instrument.

### 3) Private optimization of financing costs

With perfect capital markets, capital structure is irrelevant.<sup>25</sup> This basic insight, which originally referred to the choice between equity and debt, should also be valid for other financial instruments if identical assumptions are used. However, there are several caveats to this basic model; a number of imperfections of capital markets need to be considered when discussing private parties' choice of particular financial structures. A significant deviation from the basic model is contracting parties' limited foresight at financial close and resulting transaction costs. Among other effects, these will be analyzed below for the financial instruments used in PPP projects. With this, we attempt to provide a rationale for bidders' financing choices in PPP projects.

#### *PROJECT FINANCE VS. CORPORATE FINANCE*

External capital providers in project financings are dependent on the performance of the project for interest service and repayment. Therefore, they implement strict investment evaluations before financial close and negotiate detailed project-related rules that restrict management's options throughout the project. Furthermore, they monitor the contractor's adherence to the rules during the contract term. This makes for relatively high transaction costs resulting from structuring the project's financing and its monitoring by capital providers during the contract term. However, several advantages of this basic financial structure might improve the overall costs of financing in comparison to its alternative, corporate lending. First, by imposing strict rules, incentive conflicts between different groups of capital providers as well as between capital providers and management might be reduced.<sup>26</sup> From these conflicts in traditional corporate lending, credit constraints for a firm may result. Project finance arrangements limit possible losses for the capital providers from a single project to a certain volume defined beforehand and may allow further outside financing for liquidity- and credit-constrained companies.<sup>27</sup> Furthermore, inclusion of external equity in a single project is relatively easy.<sup>28</sup>

---

<sup>24</sup> In Germany, only one bond has been issued so far for a PPP project financing. This has been privately placed with institutional investors.

<sup>25</sup> See MODIGLIANI / MILLER (1958).

<sup>26</sup> For a discussion of advantages of project finance with respect to the conflict between equity and debt providers, see JOHN / JOHN (1991) and FLANNERY / HOUSTON / VENKATAMARAN (1993). For a discussion of conflicts between management and equity providers, see CHEMMANUR / JOHN (1996). For an analysis of conflicts between existing and potentially new capital providers, see JÜRGENS (1994).

<sup>27</sup> For a description of systems used in banks for limiting exposure to single names, see ROLFES (1999, pp. 403-11) and JORION (2003, pp. 479-87).

<sup>28</sup> This will be analyzed in more detail in the discussion of private parties' choice of design parameters in project finance below.

However, there are also advantages of corporate finance, other than lower transaction costs for structuring and monitoring the venture. For example, corporate lending is relatively more flexible because of the comparatively strict project-related rules in project finance. Adjustment of such rules, i.e. renegotiation, is naturally costly.<sup>29</sup> Furthermore, it is argued in literature that with imperfect capital markets and relatively uncorrelated cash flows from two or more projects, financing costs may decline through joint implementation as this decreases investor risk.<sup>30</sup> However, it is not clear whether such financial synergies play a significant role in bidders' decisions for a particular financing structure in PPP projects.

Given project characteristics and authority requirements in the tender specification, it is possible to determine which of the discussed basic financial structures bidders will prefer based on a weighing of the respective advantages of the instruments. When there are no requirements put forward by the authority, bidders will tend to opt for a project financing structure involving a high amount of private financing, relatively low informational asymmetries between different groups of capital providers and management as well as for services with low contracting problems and low need for flexibility.

#### **DESIGN PARAMETERS IN PROJECT FINANCE**

The consequences of imperfect capital markets are also relevant for structural decisions in project financing. For example, regarding the choice between equity and debt, there are costs of corporate bankruptcy which only creditors face.<sup>31</sup> Beside the actual amount of these costs, creditors will consider the probability of bankruptcy. A major determinant of this likelihood is the risk borne by the project company. Hence, more equity is typically needed with higher (uncontrollable) risk.<sup>32</sup> Furthermore, informational asymmetries and associated contracting problems cause incentive conflicts that may result in higher bankruptcy probability. Therefore, creditors will take into account potential informational asymmetries and contracting problems between different groups of capital providers as well as between the project company and its subcontractors and will not finance the total, but only a limited volume of the required private capital whereas the rest of the funding needs to be provided by shareholders.<sup>33</sup> With a project finance structure, however, informational asymmetries and contractual problems are reduced. Hence, high gearing appears rational if a project financing structure is used. Finally, creditors will consider specificity of the assets in the project as well as its effect on the bankruptcy costs and, with this, on capital structure.<sup>34</sup> WILLIAMSON (1988) concludes that assets with a high specificity do not lend themselves to debt financing. Assets in PPP projects are highly specific as

---

<sup>29</sup> See transaction cost literature, e.g. WILLIAMSON (1979).

<sup>30</sup> For models taking account of this effect in the choice of project finance, see FLANNERY / HOUSTON / VENKATAMARAN (1993) and LELAND / SKARABOT (2003).

<sup>31</sup> For analytical models on the choice of capital structure involving bankruptcy costs, see HARRIS / RAVIV (1990) and LELAND (1994).

<sup>32</sup> For a survey of the respective empirical evidence, see HARRIS / RAVIV (1991).

<sup>33</sup> See ALCHIAN / WOODWARD (1987) who maintain that creditors do not only assess the riskiness of the assets themselves but also their plasticity, i.e. the degree to which the shareholders and management can exploit creditors ex post by altering the asset outcome.

<sup>34</sup> See WILLIAMSON (1988).

they are valuable in the contractual relationship with the public authority. Nonetheless, because of the project finance structure, creditors are relatively easy able to take over management of the special purpose vehicle in case of bankruptcy or sell it to new shareholders.<sup>35</sup> Therefore, losses are limited for creditors and it is plausible that high gearing is used in real-life PPP projects.<sup>36</sup>

These effects on capital structure decisions also shed some light on the possibilities and limits of including financial investors, i.e. providers of external equity, in PPP project financing. Financial investors may provide equity at a lower cost compared to providers of internal equity, e.g. because of different risk preferences or other diversification possibilities. Therefore, their involvement may lower financing costs, in particular if large risks that can be controlled only to a limited extent are transferred to the contractor. This is the case, for example, if contractor takes traffic or other demand risk. However, the inclusion of financial investors is limited by some other aspects. For example, a minimum investment amount is required for the inclusion of an additional shareholder since (one-off) transaction costs for evaluating and structuring the venture have to be incurred. More importantly, internal equity may be needed to incentivize subcontractors. Property rights literature stresses the importance of allocating ownership rights for services that are difficult to contract.<sup>37</sup> This may be important for an adequate contribution of particular parties in planning activities during the structuring and contract awarding phase of the project. Furthermore, contracting problems may arise with hard-to-describe tasks in construction, maintenance, and operation during the contract term. As compared to lenders, however, financial investors are likely to be less demanding with respect to equity requirements provided by the main subcontractors since the external equity providers are directly involved in selecting and controlling the project company's management. Nonetheless, it appears reasonable that some financial investors focus on the operation and maintenance phase of projects where contracting problems are relatively limited as compared to the construction phase.<sup>38</sup> Some of the contracting problems may be circumvented by knowledge building on the part of the financial investors. It is plausible that such knowledge is a scarce resource which is hard to substitute and copy.<sup>39</sup> Therefore, it may take some time before financial investors can fully substitute internal equity providers in complex projects. However, financial investors' potential lack of knowledge may be mended over time and their importance is likely to increase with the development of PPP markets.

A major justification for the use of external equity is its accessibility to capital providers at possibly lower risk costs and, consequently, decreased costs of capital. In a similar vein, the use of bond financing may be efficient because investors with access to cheaper capital due to different risk preferences or diversification may be involved in the project. However, there are usually higher transaction costs for the issuance of a bond than for structuring of bank loan. Hence, bonds are

---

<sup>35</sup> See PULS (2003).

<sup>36</sup> See section 2.

<sup>37</sup> For an early model, see GROSSMAN / HART (1986). For a review of the property rights approach in application to financing decisions, see HART (2001).

<sup>38</sup> For empirical evidence, see NAO (2006, p. 29).

<sup>39</sup> Applying the resource-based view, knowledge seems to be a scarce resource which can be temporarily exploited for competitive advantage; see BARNEY (1991).

typically a reasonable alternative only for financing projects with high investment requirements.<sup>40</sup> Since bonds are a more rule-based financial instrument, they are chosen by private parties in projects where only a relatively low need for adjustment might occur. Similarly, some authors conclude that bonds may not be suitable for the construction phase of infrastructure projects.<sup>41</sup> This appears plausible since – as mentioned above – the construction phase is typically connected with relatively more contracting problems as compared to the operation and maintenance phase.

## 4) Qualitative evaluation criteria

With adequate awarding procedures, bidders have an incentive to optimize the bid price for the contracted service. Hence, with sufficient competitive pressure, it can be assumed that financial structures are optimized by the bidders given the project characteristics and the requirements of the public authority. However, there may be features of financial instruments which have an effect on the long-term costs of the project for the public sector but are not reflected in the contractual financing costs as part of the bid price. If financial instruments differ significantly with respect to these characteristics, public authorities should consider these disparities in their tender specification or in the bid evaluation.

### *FLEXIBILITY*

The first aspect involving differences between the financial instruments which could have an impact on long-term cost efficiency is the flexibility of the financial structure. Because of their long-term contracts with fixed-price characteristics, projects using the PPP approach tend to be less flexible than conventionally procured projects.<sup>42</sup> Service changes are comparatively expensive, e.g. because of transaction costs for the involvement of the contractor, possible incentive problems and potential information asymmetries. With adequate renegotiation design, problems can be alleviated, but not eliminated.<sup>43</sup> Higher costs of service variations in PPP projects need to be incurred in particular when capital providers have to be involved.<sup>44</sup> Approval rights and, possibly, compensation of (external) capital providers in case of service variations may be justified because such a change may alter the risk profile of a project. Furthermore, due to the variation additional private capital may be needed for financing investments.

Financial instruments used in PPP projects exhibit different qualities regarding adaptability and flexibility. Essential factors influencing flexibility are the number of capital providers directly involved in

---

<sup>40</sup> See SPACKMAN (2002, p. 286) and PwC (2004, pp. 68-9).

<sup>41</sup> See, for example, BULJEVICH / PARK (1999, p. 109).

<sup>42</sup> See LONSDALE (2005).

<sup>43</sup> See BECKERS / GEHRT / KLATT (2010b).

<sup>44</sup> For empirical evidence, see PUK (2006, pp. 59 and 80).

the project as well as the degree to which a financial instrument is rule-based, i.e. (i) with a higher number of capital providers, flexibility decreases, and (ii) more rules typically lead to lower flexibility.<sup>45</sup>

Based on these factors, project finance structures can be assumed to be less flexible than corporate finance arrangements since external capital providers are directly involved in the project and these financiers rely heavily on a rule-based financing structure. The comparative inflexibility of archetypal project financing can be traced back to the typically high leverage and the fact that debt is the relatively less flexible financial instrument in comparison to equity.<sup>46</sup> Since bonds are typically more standardized, i.e. more rule-based, and include more investors than bank loans, the flexibility of the latter instrument tends to be higher.<sup>47</sup> However, since bonds used in PPP projects are frequently privately placed with only a few bondholders and often not as standardized as publicly listed bonds, an evaluation of flexibility differences is only possible on a case-by-case basis.

With respect to the comparison between internal and external equity, there are at least two effects to be considered: On the one hand, adaptability may be lower with external equity because of vertical integration benefits between the contractor and internal capital providers. However, on the other hand, price or cost transparency, respectively, decreases with vertical integration and the contractor may be able to charge more for service adjustments.<sup>48</sup> As these theoretical discussions provide no clear direction, and empirical evidence on the adaptability of project structures using different equity instruments has been missing up-to-now, authorities should not consider flexibility in their evaluation of this particular part of the financing structure. This is opposed to the assessment of the other financial instruments where flexibility should be taken into account.

### ***MONITORING INTENSITY***

Private capital providers have incentives to monitor the performance of the contractor during the contract term. The individual financial instruments use different monitoring approaches. In corporate finance literature, there has been a heavy debate going on whether these differences result in different monitoring intensities as well.<sup>49</sup> This is also relevant for the public authority because, c.p. a higher monitoring intensity leads to lower damages to the contractor and, in consequence, to the public authority. If there are significant differences, this should be considered.

In literature, the seniority of a claim has been identified as a fundamental determinant of monitoring intensity.<sup>50</sup> It is plausible that capital providers of varying seniority, e.g. holders of equity claims and creditors, monitor with different intensities. However, this may be irrelevant since there are always

---

<sup>45</sup> See WILLIAMSON (1988) and SHLEIFER / VISHNY (1997).

<sup>46</sup> See WILLIAMSON (1988).

<sup>47</sup> For related theoretical models in corporate financing literature, see RAJAN (1992), BAGLIONI (1995), BOLTON / SCHARFSTEIN (1996) and BRIS / WELCH (2005).

<sup>48</sup> At least, distortion of bids is more costly without vertical integration since transaction costs need to be incurred for the agreement between financial investors and service providers.

<sup>49</sup> For a survey, see SHLEIFER / VISHNY (1997).

<sup>50</sup> See FAMA (1990), WINTON (1995), and PARK (2000).

stakes on each seniority level in (project) financing structures for PPP projects.<sup>51</sup> At least, there is no obvious argument that monitoring intensity increases or decreases systematically with a variation in capital structure.

Furthermore, the number of capital providers has been shown to be an important factor driving monitoring intensity. With a lower relative capital share, it is argued, the incentives to monitor performance tend to decline (“free-rider problem”). This problem has been discussed in corporate finance literature in particular for the comparison between bank loans and bonds. In some contributions, the involvement of banks has been justified by their task of “delegated monitoring”.<sup>52</sup> Although banks may have economies of scale and scope in monitoring, delegation of this task may result in incentive conflicts (between depositors and the bank) as well as in associated costs. Furthermore, solutions alleviating the free-rider problem have been developed for bonds in PPP projects. For example, third parties are involved in the monitoring of the project. For instance, rating agencies evaluate the robustness of the business case and, with this, reduce information asymmetry for bond holders. Furthermore, financial institutions may “wrap” the bond with a credit guarantee.<sup>53</sup> In this way, a single party takes the performance risk of the contractor and the free-rider problem is avoided. Therefore, no general conclusion can be drawn as to the superiority of any of the debt instruments’ monitoring approaches.<sup>54</sup>

An analogous argument can be applied to the comparison between the basic private finance structures in PPP projects. In project financing, sponsors as well as external creditors monitor the project directly, whereas in corporate finance a unit of the sponsor, e.g. the finance department, supervises project performance. In the latter case, an additional entity with monitoring tasks is established between project and capital markets. As in the comparison of debt instruments, there is no universally applicable result regarding monitoring quality since both basic financial structures are plagued with incentive conflicts in monitoring and associated transaction costs to reduce them. Furthermore, there has been no empirical hint at the dominance of any of the described monitoring systems, yet.

As a summary of the monitoring discussion, so far there is no (strong) theoretical or empirical argument in favour of any of the financial instruments analyzed. Hence, monitoring intensity should not be included as a criterion in the public authorities’ evaluation of financial structures.

---

<sup>51</sup> The argument may become clearer when examining different capital structures, e.g. one with an equity share of 30 per cent and another one with 20 per cent while the remainder is financed by debt in both cases. All else being equal, creditors will monitor more intensely in the latter case while shareholders will supervise the management to a lesser extent. The outcome from these countervailing effects is difficult to predict. Rather, there is no apparent advantage of any of the discussed capital structures in monitoring intensity.

<sup>52</sup> See, for example, DIAMOND (1984).

<sup>53</sup> Due to the financial crisis, however, bond wrapping by monoline insurers may not currently be available.

<sup>54</sup> However, there is some ground for an argument against the use of bonds with widespread distribution and no means to alleviate the free-rider problem in monitoring (e.g. bond wrapping). If such a structure is proposed by bidders, authorities should wonder whether the amount of private financing chosen was too high. At least in future projects with similar characteristics, authorities should evaluate whether the amount of private capital can be reduced.

### ***RING-FENCING***

Project finance arrangements feature ring-fencing characteristics because of the incorporation of a separate legal entity as well as the use of detailed contracts between the special purpose vehicle and the various stakeholders. Ring-fencing by establishing a separate corporation may be beneficial for the public authority in case of service changes, early termination of a project and bankruptcy of the parent company since linkages between the project and the various stakeholders are generally more transparent. However, contractual rules for the aforementioned incidents aiming at establishing effects comparable to an institutional ring-fencing may be agreed upon in projects with corporate lending as well. What is more, institutional ring-fencing can be established in corporate lending when a separate legal entity is incorporated for the project and financed exclusively from parent company's funds. This may be a particularly appropriate method since the parties can take recourse to established institutions of commercial and company law.

### ***COMMITMENT OF PARTICULAR TYPES OF FIRMS TO THE PROJECT***

Although the PPP approach based on contracts with fixed-price characteristics is mainly suitable for projects that are characterized by a relatively low complexity and (environmental) uncertainty, there are frequently parts of the service which are hardly or not at all contractible. In such activities, there is scope for opportunistic behavior by the contractor, which may be reduced by reputation effects.<sup>55</sup> Companies investing in a particular market on a long-term basis are relatively more inclined to maintain a good reputation and emphasize an adequate service provision as compared to companies planning to leave the respective market. Therefore, the bidder's reputation appears to be an appropriate criterion for the evaluation of individual bids.<sup>56</sup> However, the reputation of an individual firm should be decision-relevant. Yet, in many countries public procurement law prohibits or limits the inclusion of reputation as an evaluation criterion at the bidding stage.<sup>57</sup> Furthermore, a systematic disparity among different types of firms, e.g. financial investors vs. construction firms, in their respective approaches to reputation cannot be observed. Therefore, in the evaluation of financial instruments by the authority, this aspect should be ignored.

### ***INFORMATION GENERATION***

Some authors stress the information generation capabilities of private financing instruments in public services.<sup>58</sup> Indeed, the level of financing costs may provide hints regarding the evaluation of particular risks by private contractors as well as capital markets. These insights may be used by the authority in its decisions on risk allocation in the current or in future projects. In the contract awarding phase, such

---

<sup>55</sup> For an argument on the suitability of the PPP approach for projects with low complexity and environmental uncertainty, see QUIGGIN (2004).

<sup>56</sup> For a discussion along this line of argument, see DONI (2006) and PICCI (2006).

<sup>57</sup> As such rules may have a political-economy justification, e.g. to prevent corruption and discrimination, they are not questioned here.

<sup>58</sup> For arguments on the information generation capabilities of publicly listed capital shares, see VICKERS / YARROW (1991, p. 115) and KLEIN (1998, p. 13).

information can be generated by negotiating the allocation of particular risks. An essential requirement for this approach is a sufficiently high level of competition at negotiation stage since only in this case the bid prices will reflect the costs of the respective degree of risk transfer. The particular financing structure used, however, does not seem to be relevant for the quality of the information.

If the risk allocation is not negotiated in the bidding phase – in cases when, for example, on balancing all relevant arguments an auction suggests itself as the most appropriate awarding mechanism for the project – conclusions on the basis of information generated at procurement stage are difficult to draw. A comparison of current project's financing cost component with those of other projects is admittedly difficult, e.g. because of the distinct characteristics of each project, which give rise to different financial structures. Furthermore, the financing cost component may be strategically distorted for some reason in the current or the benchmark project. This is particularly relevant for corporate finance transactions where financing costs and other cost components are provided by the same firm.

As a last option to collect information about risk evaluation before the contract is signed, the public authority may consult market participants before the actual tender or in a dialogue stage during the tender. Incentives to reveal valid information in this process, however, seem to be limited.

During the contract term, the sale of debt or equity shares as well as the prices of publicly listed securities, e.g. bonds, may reveal information on the evaluation of a project by capital markets. For example, flaws in the project structure, which may become visible during the contract term and are reflected by the prices in secondary markets, can be taken into account in future projects. However, the procuring authority should at least have the same information regarding the project as (external) capital providers. On the basis of this information, the authority should be able to draw its own conclusions.

Summarizing one may conclude that the financial instruments discussed here exhibit only few differences in generating valuable information regarding the risk evaluation of bidders, (sub-) contractors, and capital markets. There are only few circumstances in which particular financial instruments may provide additional information.<sup>59</sup> Furthermore, these differences and the value of the information to the authority are rather limited. Consequently, public authorities should not consider differences in information generation capabilities in their decision on the use of particular financial structures or in their evaluation of bids.

## **5) Design and evaluation of financial structures in practice**

In practice, not all aspects discussed in this paper seem to be reflected in actual policy choices. For example, one may wonder why project financing is the dominating basic financing structure in PPP projects. However, a possible explanation might be that pre-financing motives often play an important

---

<sup>59</sup> For arguments on the information generation capabilities of publicly listed capital shares, see VICKERS / YARROW (1991, p. 115) and KLEIN (1998, p. 13).

role when the decision to use the PPP approach is taken.<sup>60</sup> If public authorities require that the total investment be financed by private capital due to pre-financing motives, it is reasonable that bidders propose project financing in most of the cases as this is the lowest-cost solution given the characteristics of PPP projects in infrastructure sectors. However, it can be hypothesized that more corporate financing would be proposed by private bidders if private finance schemes were designed to achieve lowest cost of service provision and private capital requirements were lowered accordingly.

With respect to qualitative characteristics, some of the issues discussed have been considered in UK guidelines. In particular, flexibility and ring-fencing have been featured. Regarding the flexibility of financing arrangements, guidelines specify that this aspect should be evaluated in the qualitative part of the value-for-money assessment.<sup>61</sup> In the discussion, the relative inflexibility of long-term senior debt (compared to equity) and bonds (compared to bank loans) has been pointed out. In particular, it has been suggested – and that would be in line with our analysis – that the cheaper financial instrument is often the less flexible. The higher flexibility of corporate finance transactions in relation to project financing has also been referred to.<sup>62</sup> Regarding ring-fencing, some implications such as dissociation from shareholder bankruptcy in project finance and the signing of detailed contracts leading to potentially higher transparency, have been discussed in documents from the UK. Although other issues have not been featured in greater detail, we may conclude that manuals for the implementation of the PPP approach in the UK provide comparatively thorough and elaborate guidance regarding (qualitative) evaluation of financing structures.

In Germany, the situation is quite different. In this relatively immature market, awareness is (almost) completely lacking regarding important issues of PPP projects' long-term performance, such as authority's flexibility. This lack was, for example, highlighted by the central government's reply to an appellation which was filed by a parliamentary group regarding PPP projects in the highway sector.<sup>63</sup> Regardless of theoretical considerations and empirical evidence in other countries, the responsible Federal Ministry for Transport, Construction and Urban Affairs stated that variations were unlikely to be more expensive in PPP contracts than with conventional procurement. This rather short-sighted approach is also reflected in guidelines for the evaluation of financing structures in PPP projects. For example, the comparatively low flexibility of bond structures (as compared to bank loans) is mentioned in a manual describing financial structures used in PPP projects.<sup>64</sup> However, this aspect is not investigated any further. Guidelines for conducting value-for-money assessments in PPP projects allow the inclusion of qualitative aspects in the assessment of different financial structures.<sup>65</sup> However, no reference is made as to which qualitative aspects to consider. Therefore, a revision of guidance

---

<sup>60</sup> See, for example, HEALD (2003), QUIGGIN (2004) and DIFU (2008).

<sup>61</sup> See HM TREASURY (2006, pp. 44-6).

<sup>62</sup> See HM TREASURY (2007, pp. 296-7).

<sup>63</sup> See BMVBS (2007).

<sup>64</sup> See PwC (2004, p. 68).

<sup>65</sup> See 3P BERATERVERBUND ET AL. (2007, p. 23).

documents and manuals should incorporate additional aspects and might provide a better framework for the realization of future PPP projects.

## **6) Conclusions**

In this paper, we have discussed the evaluation of privately provided financing instruments in PPP projects. Basically, private finance in PPP projects (and in public procurement in general) can be justified because of its safeguarding and incentive characteristics. Forfeiting models, which are used to a large extent in German municipal projects, do not provide this function and are, as a matter of principle, not to be used in PPP projects. As the main quantitative criterion for the evaluation of private financing instruments with safeguarding and incentive characteristics, financing costs have been discussed. Assuming that the bidders optimize these costs, the question was, under which circumstances particular financial instruments will be chosen by private parties. Given high private capital volumes required by authorities, it was shown that private parties' selection of project financing structures is reasonable. However, we may speculate that other financing arrangements will be used when private financing is used for its primary justification, i.e. improving cost-efficiency.

Besides, qualitative criteria potentially used by the authority in the evaluation of financing structures have been analyzed. Of all the factors discussed, flexibility was highlighted as the one feature in which financial instruments differ significantly and which may have considerable long-term cost effects. Consequently, this feature should be taken into account when the responsible authority evaluates different financial structures. With regard to the other aspects, the public authority should be able to deal with the few qualitative differences through contractual rules and should otherwise allow the bidders to optimize financial structures. In the UK, many of these issues have been considered in guidelines and manuals. In the relatively immature German market, however, there is much room for improvement.

## References

- 3P Beraterverbund / PSPC Private Sector Participation GmbH / Mütze Korsch Rechtsanwaltsgesellschaft mbH (2007):** PPP-Schulstudie, Leitfaden 4: PPP-Wirtschaftlichkeitsuntersuchung, study on behalf of the German Federal Ministry of Transport, Construction and Urban Affairs, available online: <http://www.ppp-bund.de> [13/07/2007].
- 4Ps (2008):** Financing issues for local authority capital projects, available online: <http://www.4ps.gov.uk/> [20/05/2008].
- Alchian, A.A. / Woodward, S. (1987):** Reflections on the Theory of the Firm, in: *Journal of Institutional and Theoretical Economics*, Volume 143, pp. 110-136.
- Allen, G. (2001):** The Private Finance Initiative, House of Commons Research Paper No. 01/117, available online: <http://www.parliament.uk/commons/lib/research/rp2001/rp01-117.pdf> [28/08/2008].
- Baglioni, A. (1995):** Incomplete contracts, renegotiation, and the choice between bank loans and public debt issues, in: *European Journal of Finance*, Volume 1, Issue 3, pp. 257-278.
- Barney, J. (1991):** Firm Resources and Sustained Competitive Advantage, in: *Journal of Management*, Volume 17, Issue 1, pp. 99-120.
- Beckers, T. / Gehrt, J. / Klatt, J.P. (2010a):** Rationales for the (Limited) Use of Private Finance in Public-Private Partnerships, WIP-Working Paper No. 2010-03, Berlin Institute of Technology.
- Beckers, T. / Gehrt, J. / Klatt, J.P. (2010b):** Renegotiation Design for Long-Term Contracts – The Case of Public-Private Partnerships, WIP-Working Paper No. 2010-01, Berlin Institute of Technology.
- Bentz, A. / Grout, P.A. / Halonen, M. (2004):** What Should the State Buy?, available online: <http://www.bris.ac.uk/cmpo/workingpapers/wp40.pdf> [13/07/2007].
- Blanc-Brude, F. / Strange, R. (2007):** Risk-Pricing and the Cost of Debt in Public-Private Partnerships, Department of Management Research Papers No. 45, King's College London, available online: <http://www.kcl.ac.uk/content/1/c6/02/37/62/paper45.pdf> [09/05/2008].
- BMVBS (2007) – Bundesministerium für Verkehr, Bau und Stadtentwicklung (2007):** Betreibermodell für den mehrstreifigen Autobahnausbau (so genanntes A-Modell), federal government's reply to a interpellation by the parliamentary group BÜNDNIS 90/DIE GRÜNEN regarding PPP projects in the highway sector, available online: <http://dip21.bundestag.de> [20/12/2008].

- Bolton, P. / Scharfstein, D.S. (1996):** Optimal Debt Structure and the Number of Creditors, in: Journal of Political Economy, Volume 104, Issue 1, pp. 1-25.
- Bris, A. / Welch, I. (2005):** The Optimal Concentration of Creditors, in: Journal of Finance, Volume 60, Issue 5, pp. 2193-2212.
- Buljevich, E.C. / Park, Y.S. (1999):** Project Financing and the International Financial Markets, Kluwer Academic Publishers, Boston.
- Chemmanur, T.J. / John, K. (1996):** Optimal Incorporation, Structure of Debt Contracts, and Limited-Recourse Project Financing, in: Journal of Financial Intermediation, Volume 5, Issue 4, pp. 372-408.
- Daube, D. / Vollrath, S. / Alfen, H.W. (2008):** A comparison of Project Finance and the Forfeiting Model as financing forms for PPP projects in Germany, in: International Journal of Project Management, Volume 26, Issue 4, pp. 376-387.
- De Bettignies, J.-E. / Ross, T.W. (2004):** The economics of Public-Private Partnerships, in: Canadian Public Policy, Volume 30, Issue 2, pp. 135-154.
- Dewatripont, M. / Legros, P. (2005):** Public-private partnerships: contract design and risk transfer, in: EIB Papers, Volume 10, Issue 1, pp. 120-145.
- Diamond, D.W. (1984):** Financial Intermediation and Delegated Monitoring, in: Review of Economic Studies, Volume 51, Issue 166, pp. 393-414.
- DIFU (2008) – Deutsches Institut für Urbanistik (2008):** PPP - Wirtschaftlichkeit, Qualitäten, Beratung, Partnerschaft, study on behalf of Federal PPP Task Force in the German Federal Ministry of Transport, Construction and Urban Affairs, available online: <http://www.ppp-bund.de> [20/06/2008].
- DLA Piper (2006):** European PPP Report 2005, available online: <http://www.dlapiper.com/de/global/publications/detail.aspx?pub=1884> [27/07/2008].
- Doni, N. (2006):** The Importance of Reputation in Awarding Public Contracts, in: Annals of Public and Cooperative Economics, Volume 77, Issue 4, pp. 401-429.
- Edwards, P. / Shaoul, J. / Stafford, A. / Arblaster, L. (2004):** Evaluating the operation of PFI in roads and hospitals, Research Report No. 84, Association of Chartered Certified Accountants, available online: <http://www.accaglobal.com/> [20/06/2008].
- Esty, B.C. (2004):** Why Study Large Projects? An Introduction to Research on Project Finance, in: European Financial Management, Volume 10, Issue 2, pp. 213-224.

- Esty, B.C. / Megginson, W.L. (2003):** Creditor Rights, Enforcement, and Debt Ownership Structure: Evidence from the Global Syndicated Loan Market, in: *Journal of Financial and Quantitative Analysis*, Volume 38, Issue 1, pp. 37-59.
- Fama, E.F. (1990):** Contract Costs and Financing Decisions, in: *Journal of Business*, Volume 63, Issue 1, pp. S71-S91.
- Flannery, M.J. / Houston, J.F. / Venkataraman, S. (1993):** Financing Multiple Investment Projects, in: *Financial Management*, Volume 22, Issue 2, pp. 161-172.
- Grossman, S.J. / Hart, O. (1986):** The costs and benefits of ownership: A theory of vertical and lateral integration, in: *Journal of Political Economy*, Volume 94, Issue 4, pp. 691-719.
- Harris, M. / Raviv, A. (1990):** Capital Structure and the Informational Role of Debt, in: *Journal of Finance*, Volume 45, Issue 2, pp. 321-349.
- Harris, M. / Raviv, A. (1991):** The Theory of Capital Structure, in: *Journal of Finance*, Volume 46, Issue 1, pp. 297-355.
- Hart, O. (2001):** Financial Contracting, in: *Journal of Economic Literature*, Volume 39, Issue 4, pp. 1079-1100.
- Hart, O. (2003):** Incomplete contracts and public ownerships: Remarks and an application to public-private partnerships, in: *Economic Journal*, Volume 113, Issue 486, pp. C69-C76.
- Heald, D. (2003):** Value for Money Tests and Accounting Treatment in PFI Schemes, in: *Accounting, Auditing & Accountability Journal*, Volume 16, Issue 3, pp. 342-371.
- HM Treasury (2006):** VFM Assessment Guidance, available online: [http://www.hm-treasury.gov.uk/documents/public\\_private\\_partnerships/](http://www.hm-treasury.gov.uk/documents/public_private_partnerships/) [01/08/2007].
- HM Treasury (2007):** Standardisation of PFI Contracts (SoPC) Version 4 - March 2007, available online: [http://www.hm-treasury.gov.uk/documents/public\\_private\\_partnerships/](http://www.hm-treasury.gov.uk/documents/public_private_partnerships/) [24/07/2007].
- John, K. / John, T.A. (1991):** Optimality of Project Financing: Theory and Empirical Implications in Finance and Accounting, in: *Review of Quantitative Finance and Accounting*, Volume 1, Issue 1, pp. 51-74.
- Jorion, P. (2003):** *Financial Risk Manager Handbook*, 2<sup>nd</sup> edition, John Wiley & Sons, Hoboken.
- Jürgens, W.H. (1994):** *Projektfinanzierung - Neue Institutionenlehre und ökonomische Rationalität*, Gabler, Wiesbaden.
- Klein, M. (1998):** Bidding for Concessions, Policy Research Working Paper No. 1957, World Bank, available online: <http://econ.worldbank.org/> [20/02/2008].

- Kronman, A.T. (1985):** Contract Law and the State of Nature, in: Journal of Law, Economics and Organization, Volume 1, Issue 1, pp. 5-32.
- Leland, H. (1994):** Corporate Debt Value, Bond Covenants, and Optimal Capital Structure, in: Journal of Finance, Volume 49, Issue 4, pp. 1213-1252.
- Leland, H. / Skarabot, J. (2003):** Financial Synergies and the Optimal Scope of the Firm: Implications for Mergers, Spinoffs, and Off-Balance Sheet Finance, Working Paper, Haas School of Business, available online: <http://www.haas.berkeley.edu/faculty/pdf/LS55.pdf> [20/12/2007].
- Lonsdale, C. (2005):** Post-Contractual Lock-in and the UK Private Finance Initiative (PFI): the Cases of National Savings and Investments and the Lord Chancellor's Department, in: Public Administration, Volume 83, Issue 1, pp. 67-88.
- Modigliani, F. / Miller, M.H. (1958):** The cost of capital, corporation finance and the theory of investment, in: American Economic Review, Volume 48, Issue 3, pp. 261-297.
- NAO (2006) – National Audit Office (2006):** Update on PFI debt refinancing and the PFI equity market, available online: [http://www.nao.org.uk/publications/nao\\_reports/05-06/05061040.pdf](http://www.nao.org.uk/publications/nao_reports/05-06/05061040.pdf) [25/07/2007].
- Park, C. (2000):** Monitoring and Structure of Debt Contracts, in: Journal of Finance, Volume 55, Issue 5, pp. 2157-2195.
- Picci, L. (2006):** Reputation-based Governance of Public Works, 2nd International Public Procurement Conference, available online: <http://didattica.spbo.unibo.it/picci/rebag-publicworks.pdf> [20/06/2008].
- PUK (2006) – Partnerships UK (2006):** Report on Operational PFI Projects, available online: <http://www.partnershipsuk.org.uk/information/puk-news.asp> [26/07/2007].
- Puls, U. (2003):** Spezifität, Kapitalstruktur und Projektfinanzierung, Peter Lang, Frankfurt/Main.
- PwC (2004) – PricewaterhouseCoopers (2004):** Finanzierungsleitfaden, available online: <http://www.ppp.nrw.de/publikationen/index.html> [24/07/2007].
- Quiggin, J. (2004):** Risk, PPPs and the Public Sector Comparator, in: Australian Accounting Review, Volume 14, Issue 2, pp. 51-61.
- Rajan, R.G. (1992):** Insiders and Outsiders: The Choice Between Informed and Arm's-Length Debt, in: Journal of Finance, Volume 47, Issue 4, pp. 1367-1400.
- Rolfes, B. (1999):** Gesamtbanksteuerung, Schäffer-Poeschel Verlag (Handelsblatt-Reihe), Stuttgart.

- Shleifer, A. / Vishny, R.W. (1997):** A Survey of Corporate Governance, in: Journal of Finance, Volume 52, Issue 2, pp. 737-783.
- Spackman, M. (2002):** Public-private partnerships: lessons from the British approach, in: Economic Systems, Volume 26, Issue 3, pp. 283-301.
- Torres, L. / Pina, V. (2001):** Public-private partnership and private finance initiatives in the EU and Spanish local governments, in: European Accounting Review, Volume 10, Issue 3, pp. 601-619.
- Vickers, J. / Yarrow, G. (1991):** Economic Perspectives on Privatization, in: Journal of Economic Perspectives, Volume 5, Issue 2, pp. 111-132.
- Vining, A.R. / Boardman, A.E. (2008):** Public-Private Partnerships in Canada - Theory and Evidence, in: Canadian Public Administration, Volume 51, Issue 1, pp. 9-44.
- Williamson, O.E. (1979):** Transaction-cost Economics: The Governance of contractual relations, in: Journal of Law and Economics, Volume 22, Issue 2, pp. 233-261.
- Williamson, O.E. (1983):** Credible Commitments: Using Hostages to Support Exchange, in: American Economic Review, Volume 73, Issue 4, pp. 519-540.
- Williamson, O.E. (1988):** Corporate Finance and Corporate Governance, in: Journal of Finance, Volume 43, Issue 3, pp. 567-591.
- Winton, A. (1995):** Costly state verification and multiple investors, in: Review of Financial Studies, Volume 8, Issue 1, pp. 91-123.