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**Renegotiation Design for Long-Term Contracts
The Case of Public-Private Partnerships**

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by

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Abstract

Renegotiations are a major issue in long-term fixed-price contracts as they are used in so-called public-private partnerships (PPPs). Assuming a well-developed institutional framework we focus on contract amendments in terms of new or modified service requirements that might ensue due to an initially unanticipated development in the project's environment. In this kind of renegotiations which can be welfare-enhancing we identify the contractual renegotiation design as a major driver for efficient outcomes. Renegotiation clauses can be assigned to three stages which together form a renegotiation process: (i) variation procedures, (ii) dispute resolution mechanisms, and (iii) termination clauses. Although dispute resolution mechanisms are used only rarely and PPP projects are terminated only in very exceptional cases, the design of the latter stages is still important, since the potential outcomes of these stages have an impact on the project parties' behaviour during the whole renegotiation process. Based on new institutional economics, we discuss appropriate options for the design of each stage. Finally, we compare the results with provisions from PPP projects in the UK and Germany and identify potential for improvement.

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1) Introduction

Fixed-price agreements provide strong incentives for efficient implementation of the agent's duties that have been agreed on in the original contract. However, due to bounded rationality and limited foresight, not all of principal's requirements that may become relevant during the contract term will be included in the original provisions, i.e. renegotiations are very likely with long-term fixed-price contracts. Transaction cost theory stresses the associated problems.¹ In particular, this approach highlights possible hold-up during the contract term and contracting parties' acceptance of transaction costs to circumvent this problem. These transaction costs are incurred by the contracting parties for inclusion of the respective clauses in the initial contract and for the actual renegotiation during the contract term. Although there are many theoretical models analyzing the effect of particular renegotiation clauses on the efficiency of service provision, only few papers study renegotiation clauses as they are used in practice.²

In this paper we examine service amendment rules that are used in so-called public-private partnerships (PPPs). The PPP approach is a procurement option in which the public authority purchases a service from a private contractor in a long-term contract with typical durations of 20-35 years.³ In the contract, several tasks needed for the provision of an infrastructure facility are bundled, i.e. one contractor is responsible for construction, maintenance, and operation. This is opposed to conventional procurement in the public sector where the tasks are separately procured in comparatively short-term contracts or are provided in-house by a government agency or public enterprise, respectively. PPP projects stipulating a fixed price may decrease authority's procurement costs since incentives for life-cycle optimization can be established through the transfer of cost risks.⁴ Relying on this argument, an increasing number of public authorities are using the PPP approach.⁵

Contracts with fixed-price features like those used in many PPP projects are particularly preferable if the service to be provided is of low complexity and little environmental uncertainty, i.e. the purchased service has to be definable in the original contract.⁶ Unsurprisingly, therefore, the British government includes these features when listing requirements for the application of the PPP approach.⁷ Neverthe-

¹ See WILLIAMSON (1979) and CROCKER / MASTEN (1996).

² See FARES (2006) and TIROLE (1999) for a review of the incomplete contract theory which analyzes the impact of renegotiations on the efficiency of service provision.

³ See BENTZ / GROUT / HALONEN (2004, p. 3), DE BETTIGNIES / ROSS (2004) and SAUSSIER / STAROPOLI / YVRANDE-BILLON (2009, pp. 3-4) for similar definitions.

⁴ See SAUSSIER / STAROPOLI / YVRANDE-BILLON (2009, pp. 6-7).

⁵ In practice, pre-financing of infrastructure facilities is another important motivation for the application of the PPP approach, although, from an economic point of view, this should not be the case.

⁶ See HART (2003).

⁷ See HM Treasury (2003, pp. 29-30).

less, because of long contract durations, new service requirements will almost inevitably occur and prompt renegotiations of the original contract provisions. Based on new institutional economics and taking into account empirical evidence from the UK and Germany, this paper analyzes means to tackle associated problems.

The paper is structured in the following way: Section 2 presents empirical evidence regarding the frequency of renegotiations in PPPs and derives a classification of renegotiation situations. After referring to several factors that may influence renegotiation outcomes, the analysis is then focused on contractual rules for implementing altered service requirements by the principal of the contractual relationship, i.e. the public authority. In section 3, the structure and basic elements of service amendment rules that are used in practice are discussed for their economic rationale. These elements are used at three stages, which, together, make up the renegotiation process presented in section 4. For each of these stages, typical contract clauses are analyzed on the basis of theoretical considerations. In section 5, results from the theoretical analysis are confronted with empirical evidence on renegotiation provisions used in British and German PPP contracts. We draw on a sample of standard and model contracts, contracts (made anonymous) from real-life projects as well as on some 40 interviews conducted with experts from these markets. Section 6 concludes.

2) Renegotiation problems and possible solutions

Renegotiations and their effects on the long-term performance of individual governance mechanisms (including long-term contracts) have been widely discussed in economic literature.⁸ Many of these contributions, however, do not differentiate among types of renegotiation. Hence, identical recommendations are derived for all kinds of amendments. Yet, it is useful to differentiate renegotiations according to the motive of the initiating party. This party may have opportunistic motives, i.e. the renegotiation is meant to increase the initiating party's rent from the relationship, typically at the cost of the other contracting party, without having any justification from the contract itself or from developments in the project's environment. Studies analyzing concession contracts in Latin America highlight the problems of such renegotiations.⁹ For example, contractors were in many cases successful in increasing their return from the contract in a renegotiation of initial terms when the original bid was intentionally so low that cost recovery was not possible ("low-balling").¹⁰ Furthermore, evidence suggests that governments used renegotiations to achieve political goals and bypass control mechanisms in the public sector.¹¹ Since such renegotiations increase the costs of service provision for the users and the tax

⁸ See WILLIAMSON (1979), contributions from the incomplete contract theory like GROSSMANN / HART (1986), and empirical analyses like CROCKER / REYNOLDS (1993).

⁹ See GUASCH (2004) and ESTACHE ET AL. (2009).

¹⁰ For empirical evidence, see GUASCH / LAFFONT / STRAUB (2003). For a model taking this effect into account, see Ho (2006).

¹¹ For empirical evidence, see GUASCH / LAFFONT / STRAUB (2007). For a political-economy model, see ENGEL / FISCHER / GALETOVIC (2006).

payers, respectively, they should be avoided. To reduce the probability of such renegotiations, one of the most common recommendations given in the above-mentioned contributions is to develop an appropriate institutional framework.

However, as transaction cost theory suggests, long-term fixed-price contracts are frequently incomplete since contracting parties have bounded rationality and limited foresight.¹² Hence, renegotiations can be used to adapt a long-term contract to an initially unanticipated development in the project's environment and associated new or modified service requirements. Contracting parties' desire to adjust the original contract to changing requirements may be classified as a non-opportunistic motive for a renegotiation.¹³ Such changes can be welfare-enhancing. Hence, their implementation may be beneficial. Nonetheless, such renegotiations are problematic as contracting parties may behave opportunistically during the renegotiation process even if a renegotiation is started with non-opportunistic motives. Theoretical considerations suggest that variations are more expensive in long-term fixed-price contracts as compared to vertically integrated services, e.g. because of transaction costs.¹⁴ Applied to public sector sourcing, PPP projects which are based on long-term contracts with fixed-price characteristics tend to be less flexible than conventional procurement. By means of an appropriate (contractual) renegotiation design, problems may be mitigated, but not eliminated. On the whole, therefore, the PPP approach seems to be only suitable when renegotiation problems are limited. In particular, the service should be of comparatively low complexity and environmental uncertainty should be limited.¹⁵

Theoretically plausible renegotiation problems as presented above can also be observed in real-life PPP projects. For example in the UK the PPP approach is being used in some 880 projects and has been a major procurement route for the provision of roads, hospitals, schools, prisons and public administration buildings since the beginning of the 1990s. In that case, several surveys consistently report that variations were necessary in the majority of projects.¹⁶ Most of these amendments to original provisions were initiated by the authorities.¹⁷ Consistent with theory, findings suggest that the costs of such renegotiations were significant. For instance, procurement officers have frequently been reported as saying the prices for contract variations were high.¹⁸ Furthermore, reports observe that the transac-

¹² See, e.g. WILLIAMSON (1979).

¹³ In practice, the lines between opportunistic and non-opportunistic motives are blurred. For instance, contracting parties might agree that some initial contract clauses are ambiguous and need a revision. Insofar as there is a real gap in original provisions that needs to be closed, motivations for such renegotiations may be assigned to the non-opportunistic category. However, such contractual ambiguities might also be used to disguise opportunistic motives.

¹⁴ See WILLIAMSON (1979).

¹⁵ See QUIGGIN (2004).

¹⁶ See NAO (2001, pp. 14-5), CEPA (2005, p. 37), and PARTNERSHIPS UK (2006, p. 84).

¹⁷ See CEPA (2005, p. 29), and NAO (2008, p. 10).

¹⁸ See NAO (2001, p. 15), MoD (2005, p. 4), and NAO (2008, p. 14).

tion costs of contract variations are substantial.¹⁹ These problems led to revisions of contractual provisions for the implementation of variations requested by the authority. This is consistent with literature analyzing the development of contractual complexity and highlighting contract provisions' tendency to become more intricate when problems have occurred in prior relationships with similar services.²⁰

Beyond the design of the respective contractual provisions, there are other factors influencing the outcome of renegotiations in PPP projects. For example, reputation considerations may limit opportunistic behavior and, hence, influence renegotiation results.²¹ Similarly, the theory of implicit contracts suggests that opportunistic behavior is more restricted when transactions between identical parties occur repeatedly.²² Hence, it may be argued that at the beginning of a contracting relationship, the contracting parties' conduct in renegotiations can be expected to be more co-operative. With co-operation, trust may develop which stabilizes long-term contracts.²³ However, opportunistic behavior is limited in repeated transactions only if the affected party is able to exit the relationship, which might not be the case at reasonable cost in a long-term contract. Hence, the effect of repeated renegotiation is, at least, ambiguous. The incentives of the parties involved are another influencing factor for outcomes of renegotiations. Private sector incentive systems are often focused on the generation of profit, whereas objectives in the public sector are frequently multidimensional or ambiguous, respectively.²⁴ Hence, contractor's staff in a PPP project is often better incentivized to achieve their employer's objective in renegotiations leading to potentially adverse renegotiation outcomes for the authority. Correspondingly, the private sector parties are frequently more deeply versed in renegotiating as, in decentralized organizational structures at least, public sector authorities are often responsible for only one or very few PPP projects while private contractors are typically involved in many schemes leading to potentially better knowledge building. However, not only know-how, but also access to project-related information may be relevant in renegotiations.²⁵ As in many principal-agent relationships, the authority may suffer from information asymmetries which may allow the contractor to generate rents in renegotiations. Last but not least, laws, customs, and – as mentioned above – the institutional framework in a particular market may have effects on renegotiations in PPP projects.

A thorough discussion of all these aspects is beyond the scope of this paper. We focus on the contractual renegotiation design since theoretical considerations and empirical evidence suggests that contractual provisions have an important effect on renegotiation outcome. As yet, however, there has not

¹⁹ See for evidence, among others, 4Ps (2005, pp. 9-10), CEPA (2005, p. 30), MoD (2005, p. 4), and PARTNERSHIPS UK (2006, p. 8).

²⁰ See, for example, MAYER / ARGYRES (2004).

²¹ See CROCKER / REYNOLDS (1993), CROCKER / MASTEN (1996), and BAJARI / TADELIS (2001).

²² See BAKER / GIBBONS / MURPHY (1994).

²³ See WILLIAMSON (1979).

²⁴ See DOMBERGER / JENSEN (1997).

²⁵ See WILLIAMSON (1991).

been a comprehensive discussion of provisions governing service variations in long-term contracts with fixed-price characteristics in economic literature. In the analysis, we adopt the perspective of the principal, i.e. the public authority, and assume that its overriding objective is the minimization of costs from the project, i.e. cost-efficiency. As suggested by empirical observations we focus on the implementation of new service requirements requested by the public authority.

3) Basic elements of contractual renegotiation design

An essential element of renegotiation rules in PPP contracts, but also in other long-term fixed-price agreements, is an unfettered right of the principal to request changes.²⁶ The contractor is allowed to reject the variation request only in strictly defined circumstances. As principal and agent are usually in a bilateral monopoly at the time of the renegotiation, this right is useful from the principal's perspective: The renegotiation problem boils down to determining an appropriate compensation for the contractor. The amount of the contractor's compensation for a variation should reflect the costs of efficient implementation. If renegotiation rules systematically deviate from this level, bid prices for the original contract will be increased because of the resulting risk to potential contractors. Furthermore, there are indications that transaction costs for dispute settlement increase significantly in case of large divergences from (opportunity) costs.²⁷

Given this very general consideration on compensation levels, parties may determine the contractor's actual compensation for a variation at three points in time. First, they may agree on prices in the original contract. Second, prices can be negotiated immediately before a variation is implemented. Last, parties may settle on the price even after the implementation. Each of these options is associated with particular problems. Most obviously, there are incentive problems as in typical cost-plus contracts, e.g. cost padding and hidden action if compensation is determined after implementation.²⁸ If prices are agreed on immediately before the variation is implemented, parties typically negotiate a fixed-price contract within a bilateral monopoly. In this situation, the authority often suffers from informational asymmetries which may allow the contractor to generate rents.²⁹ If prices for variations are fixed in the original contract, the contractor may take significant risks. This will be factored into the bid as private parties are typically risk-averse.³⁰ Furthermore, there are incentives for distorting bids if separate pric-

²⁶ See for PPP contracts, e.g., HM TREASURY (2007, p. 87) and 3P BERATERVERBUND ET AL. (2007a, p. 57). For evidence from other types of long-term fixed-price contracts, see BAJARI / TADELIS (2001, p. 391) and BEN-SHAHAR / WHITE (2006, p. 980).

²⁷ See GOLDBERG (1985, p. 532), and CROCKER / MASTEN (1991, p. 74).

²⁸ See MCAFEE / MCMILLAN (1988) and BAJARI / TADELIS (2001).

²⁹ It is often suggested that, for fixed price contracts, competitive awarding procedures are helpful in reducing contractor's informational rents; see KLEMPERER (2004). However, competitive award of a change in service might not be efficient as will be discussed below.

³⁰ Allocation of substantial risks to the contractor, in turn, may decrease competition at contract awarding stage; see MCAFEE / MCMILLAN (1988).

es for the main service and variations are negotiated.³¹ Finally, all options are potentially associated with substantial transaction costs.

The decision to use a particular renegotiation rule should take these effects into account. For an appropriate choice, contracting parties should consider the characteristics of the (potential) variation very much as they should take the features of the service into account when selecting a procurement approach. Major determinants are the variation's complexity and the uncertainty of its environment, its value and the expected frequency of its application. Furthermore, the variation's production costs risk needs to be taken into account. However, such risks might be reduced through an indexation or other means to share price risks.³²

Renegotiation provisions that are used in practice to deal with the above-mentioned problems can be categorized as either process rules or calculation rules. Process rules describe conditions for the use of a particular clause, process steps, responsibilities, and time frames. Calculation rules define the basis for the determination of the contractor's compensation and may include prices, agreements on risk allocation, as well as methods of price calculation. Some renegotiation clauses only consist of a process description, whereas with a thorough calculation rule the associated process provision may be less detailed. Furthermore, if a variation can be easily described in the original contract, e.g. because of relatively low complexity, contracting parties are typically better able to agree on an appropriate calculation rule.

4) Three stages in contractual renegotiation design

In PPP contracts and other long-term fixed-price agreements, process and calculation rules are used at three stages, which together make up the renegotiation process. First, there are typical variations procedures for the determination of an appropriate compensation, including both process and calculation rules. Second, if the parties are not able to reach an agreement in the variations procedure, dispute resolution mechanisms can be invoked. These include typically no calculation rules, but only process descriptions. Third, as an ultimate means in the renegotiation process, the project can be cancelled using termination procedures which should consist of process as well as calculation rules. Whereas variations procedures are frequently applied in real-life projects, dispute resolution mechanisms are used only rarely, and projects are terminated only in very exceptional circumstances.³³ Nevertheless, the design of the subsequent stages in the renegotiation process is important, since the project parties anticipate outcomes from stages that are eventually used after negotiation failure in the first stages (backward induction).

³¹ For a discussion of strategic bidding, see ATHEY / LEVIN (2001) and EWERTHART / FIESELER (2003).

³² For price adaptation in long-term contracts, see CROCKER / MASTEN (1991).

³³ For the incidence of dispute resolutions, see NAO (2001, p. 14) and PARTNERSHIPS UK (2006, p. 81); for terminations, see LEAHY (2005, p. 69).

4.1) Stage 1: Variation procedures

As mentioned above, prices for variations may be determined at three points in time. Since the suitability of particular provisions depends on the characteristics of the variation and its environment, it is generally efficient to include differentiated variations procedures in the contract. For example, the contractor's remuneration may be negotiated after the implementation of the variation. However, this option should only be used in rare special cases because of the associated incentive and measurement problems. Potential reasons for an exception of this general rule may include very low value of the amendment as well as high complexity, high uncertainty of the variation's environment, or high (uncontrollable) risk at the time of the implementation because of transaction cost and risk considerations. Furthermore, time pressure may be an argument in rare situations, but not a general justification.³⁴

At the other extreme, prices for variations may be defined in the original contract. In this case, the contracting parties agree on real options that may be called upon during the contract term. For a (limited) number of variation types, options in the original contract may be an appropriate mechanism. From the perspective of the original contract, variations (or respective inputs) should be of low complexity. Otherwise, significant (ex ante or ex post) transaction costs would result. Furthermore, costs for the implementation of the variation should be reasonably predictable. If not, potential contractors will factor costs of risk-bearing into their bid. Because of transaction costs for including options in the original contract, they should cover a sufficient (expected) value of variations, i.e. either low-value options are expected to be used frequently or high-value options are anticipated to be implemented with appropriate probability. One of the remaining problems is the distortion of bids. Bidders may be better able to predict the (expected) number of variations that are implemented using the options, e.g. because of more experience in the implementation of PPP projects. In this case, they have an incentive to propose prices for individual items that do not correspond to their costs of efficient implementation, i.e. to distort their bids. A possible solution is specification of option prices by the authority.³⁵ However, this may result in significant risk-bearing costs to contractors, which bid prices will reflect.

Prices for variations that do not meet the requirements for agreement in the original contract or after execution should be determined immediately before implementation. The main problem of a bilateral negotiation is the information asymmetry that may allow the contractor to generate rents. The responsible authority may try to limit the contractor's compensation by conducting a benchmarking or involving an expert. While the latter alternative is usually very costly and, hence, is only suitable for large variations, the former option requires a very knowledgeable authority. Evidence from the UK suggests

³⁴ For example, if a variation needs to be implemented before a very important event like the Olympic Games, such a cost plus-like variation procedure may be appropriate. However, it is not appropriate for a variation that a politician intends to complete before an election in order to attract voters.

³⁵ This was, for example, implemented in Chilean concession contracts; see GOMEZ-LOBO / HINOJOSA (2000, p. 17).

that benchmarking exercises are difficult even for comparatively standardized services.³⁶ Another option is to require a tender of the variation. As transaction costs to the tendering party can be substantial, this mechanism is only suitable for large variations. More importantly, there are various reasons why bidding intensity might be low and render a tender of the variation pointless. For example, the contractor for the PPP project may realize economies of scale or scope with the original service. Furthermore, interference problems between the original service provider, the public authority and the contractor for the variation may result in significant transaction costs even after the implementation of the variation. Additionally, possible incumbent-related problems have to be taken into account. For instance, outsiders are usually at a disadvantage regarding information on project characteristics and required costs for implementing the variation which may lead to low competition in the tender.³⁷ Besides, discriminatory and collusion problems have to be considered. To summarize, the requirement to tender a variation should not be overrated. However, a right of the authority to request a tender after negotiations with the original contractor have failed might have valuable disciplining effects.³⁸ Although not observed in practice, this effect might even be amplified by the right to exclude the original contractor from the bidding competition for the variation.

Agreement on the price for a variation may not be enough in actual PPP projects. As the provision of private capital is often part of the contracted service, the effects of amendments on private capital provision and, particularly, the involvement of financiers in variation negotiations need to be discussed as well. As a matter of principle, capital providers that are directly dependent on the project's success should be involved in the negotiation for a variation. Since the project's risk profile may change with the variation, an approval right and possibly a compensation privilege is generally efficient. Because of transaction costs and incentive conflicts when admitting an additional party to the negotiation of a variation, limiting the capital providers' involvement to larger variations may be justified.³⁹

4.2) Stage 2: Dispute resolution

If the contracting parties are not able to reach an agreement on the compensation for a variation, dispute resolution mechanisms can be used in the second stage of the renegotiation process. However, these procedures may also be useful for other types of disagreement that may arise during the contract term. Often, several mechanisms are combined to form a multi-stage dispute resolution process. It appears reasonable to use a multi-stage process in which the intensity of the decision-making and, hence, the quality of the conclusion as well as the transaction costs for implementing a single mechan-

³⁶ See NAO (2007).

³⁷ See, for example, WILLIAMSON (1976).

³⁸ In this way, a situation comparable to a contestable market is established; see BAUMOL / BAILEY / WILLIG (1977).

³⁹ Based on its safeguarding and incentive function, private capital may also be used for funding the investments of a variation. However, as with the original service, partial protection against potential damages is generally efficient; see BECKERS / GEHRT / KLATT (2010).

ism increase from stage to stage. From a normative point of view, there is no (strong) argument for any number of stages without looking at cost effects in detail.

In practice, however, three-stage processes are often used. As a final stage, official judicial proceedings may be used. Alternatively, so-called alternative dispute resolution (ADR) procedures with a binding decision, e.g. an arbitration process, can be applied. Contributions from the economics-of-law approach highlight that arbitration processes, as compared to judicial proceedings, may decrease (transaction) costs.⁴⁰ However, it is also stressed that the application of mechanisms with non-binding decisions, e.g. a conciliation, may be reasonable as a step before a procedure with binding decision. However, mechanisms with non-binding decisions are only useful if they cause low transaction costs and have sufficient predictive power for the subsequent stage with binding resolution.⁴¹ The same reasoning can be applied to the first stage in dispute resolution, which in many PPP projects consists of a project council of senior managers/officers from both project parties. Their involvement can be justified by low transaction costs and increased probability of agreement because of their greater discretionary power as compared to the working level.

4.3) Stage 3: Termination

Termination rights are the third and ultimate stage in the renegotiation process. In economic literature, frequently termination rights in long-term contracts have been exclusively characterized as part of the incentive system aimed at ensuring contract compliance.⁴² Beyond this purpose, however, it may be reasonable include unilateral and unconditional termination rights that can be exercised by the authority (authority voluntary termination).⁴³ With such a right, the authority is better able to respond to (possibly large) changes in its project requirements, e.g. if the project needs major re-dimensioning which is difficult to implement with the current contractor or if the facility is not needed anymore because demand for the service has decreased significantly. Such voluntary termination rights should be exercised only in strictly defined extraordinary circumstances. Nonetheless, it is important to include appropriate provisions as they give the authority not only increased flexibility but also an ultimate threat point limiting hard-to-describe opportunistic behavior by the contractor, e.g. in renegotiations.

Compensation should reflect the contractor's opportunity costs from the termination, since deviations from this level may result in significant risk-bearing costs. Furthermore, low levels of compensation may establish (undesirable) incentives to use the termination for political reasons. Opportunity costs can be determined from outstanding cash flows from the project. Scheduled expenses that are not

⁴⁰ See KAPLOW / SHAVELL (2002).

⁴¹ See SHAVELL (1995).

⁴² See, for example, STIGLITZ / WEISS (1983) and ECKHARD / MELLEWIGT (2006).

⁴³ For a basic argument regarding termination's effect on contracting parties' flexibility, see GOETZ / SCOTT (1981). For an application to PPP projects, see QUIGGIN (2005).

incurred after termination should be deducted. At the time of the termination, the authority may suffer from informational asymmetries regarding these variables. Hence, in the original contract it is reasonable to define outstanding cash flows as well as those costs that do not have to be incurred after a termination in a base case model reflecting the scheduled development of the project.⁴⁴ Furthermore, this model should involve a plan for the evolution of the structural quality of the asset, i.e. the quality dimension that describes the inherent value of the asset that users may not experience (in the short term), but that determines re-investment need in the (expected) life of the facility. For establishing incentives to maintain appropriate structural asset quality, termination compensation should be adjusted for possible deviations from agreed standards. However, determining the structural quality of the asset and its monetary value can be a difficult task and remain a high obstacle to the application of this approach.

Appropriate discounting is necessary to account for the present value of future cash flows as well as for the risks that would remain in the project. In some cases, cash flows have been discounted using a risk-free rate.⁴⁵ This, however, unreasonably assumes that no risks are left in the project. Rather, risk-appropriate discounting should be used. As project risks are not constant throughout the contract term, the discount rate varies at individual project phases. Typically, from a financiers' point of view, a high-risk construction phase is followed by a rather low-risk operations and maintenance phase in infrastructure projects.⁴⁶ Capital market prices for taking particular risks are a valid measure of opportunity costs of risk-bearing. Hence, they provide an orientation for appropriate risk-adjusted discount rates. However, capital market prices fluctuate, i.e. they represent a risk themselves. Since the contractor is not able to influence these prices and there are no incentive effects from a risk transfer, at first glance it appears rational that the authority should bear this risk. However, measurement and evaluation problems at the time of the possible termination suggest that the risk may be borne by the contractor. Along with other parameters, the risk-adjusted discount rate for each project phase could be fixed in the base case model.

Finally, reasonable breakage costs of the contractor should be included in the compensation. For breakage costs of some significance, it may be reasonable for the authority to agree upon an appro-

⁴⁴ For this purpose, it is important to recognize that some cost components of sometimes considerable value are frequently hidden in the equity return, e.g. bidding expenditures and management costs of the project company. For valid estimation of outstanding cash flows in case of termination, such cost components should be accounted for separately in the base case model.

⁴⁵ For example in the UK, termination provisions for PPP bonds often stipulated that outstanding cash flows have to be discounted using an appropriate gilt rate, i.e. a rather risk-free rate. The UK government now specified that such so-called Spens Clauses have to be modified; see HM TREASURY (2006).

⁴⁶ See ESTY (1999) and MANDRON (2000). ALCHIAN / WOODWARD (1987) maintain that capital providers do not only evaluate the assets' risks themselves, but also their plasticity, i.e. the degree to which management can exploit capital providers ex post by altering the asset outcome. It can be convincingly argued that information asymmetries and corresponding contracting problems are more severe at construction phase as compared to the operation and maintenance phase.

priate level, either in the original contract or even at the project-overarching program level.⁴⁷ For other subcontracts, the private parties have some discretion in making agreements and the authority may not want to check all these provisions for transaction costs reasons which may result in undue inflexibility. In particular to prevent such situations and to reduce transaction costs when the contract is actually terminated, it may be beneficial to agree in the original contract upon fixed termination compensations for particular dates during the contract term, e.g. after every five or ten years.⁴⁸ Those dates can be used by the contractor to make appropriate agreements with subcontractors. However, the basic level of compensation should be the same as with determination of compensation from the base case model, as contractor opportunity costs are the same in both situations.

5) Evolution of renegotiation clauses in selected markets

5.1) UK

Typical renegotiation rules differ significantly across countries. In the UK market, contracts for individual projects are developed primarily on the basis of centrally provided standard contracts.⁴⁹ Many of the recommendations concerning renegotiation rules discussed above are included in the latest version of this standard. For example, it is stated that variations procedures should be differentiated by the characteristics of the variation.⁵⁰ To provide a rather simple rule, guidelines propose to distinguish variation processes by their value. It is stressed that transaction costs are an important factor for efficiency in small-value variations, whereas higher transactions costs may be acceptable in amendments of greater value if this leads to lower overall costs to the authority. Hence, pre-priced options should be used for small and medium variations. For large variations, on the other hand, authorities can choose between tender requirements, benchmarking and the enlistment of an independent expert. Besides, standard contracts have introduced rules governing the involvement of financiers in variations which correspond to the recommendations derived above.⁵¹ For dispute resolution rules, a three-stage process is stipulated.⁵² After a project-internal attempt to resolve the disagreement, an ADR procedure with non-binding decision should be used. Only then, a binding resolution using an ADR mechanism or a court proceeding should be sought. Finally, authority's termination rights have been enhanced. Beside a termination right with determination of contractor's compensation based on the financial model or market value, which had already been present in the previous version of the standard con-

⁴⁷ The UK government has published guidance that it is not willing to accept breakage costs for debt contracts beyond some threshold; see HM TREASURY (2006).

⁴⁸ See QUIGGIN (2005) for a similar argument.

⁴⁹ For the current version, see HM Treasury (2007); for the previous version, see HM TREASURY (2004).

⁵⁰ See HM TREASURY (2007, pp. 84-98).

⁵¹ See HM TREASURY (2007, pp. 90-1).

⁵² See HM TREASURY (2007, pp. 233-9).

tracts, they now include an option to use so-called authority break points.⁵³ These represent dates within the contract term at which the authority may unilaterally terminate the relationship at a compensation agreed upon in the original contract. The standard contracts stipulate that the compensation at authority break points should be somewhat lower than those for the other mechanisms for determining contractor's compensation. This recommendation is not convincing as the reduction of transaction costs is the primary reason for the introduction of such rules. Nonetheless, renegotiation rules for PPP projects are comparatively sophisticated.

5.2) Germany

In Germany, PPP projects have been used in app. 100 cases since the late 1990s. Beside a limited number of road schemes, small-scale administration building and school projects dominate. Renegotiation rules are comparatively underdeveloped. In many projects, the rules for the implementation of variations are not differentiated and stipulate a negotiation based on a contractor's cost estimate with its severe incentive problems and information asymmetries. The model contracts for real estate projects, which have been updated recently, have corresponding provisions.⁵⁴ However, more sophisticated clauses, e.g. tender requirements for larger variations or pre-priced options for variations of low complexity, are being used in some projects. Regarding dispute resolution, processes comparable to those in the UK are being used. Commonly, a three-stage process with (i) a project advisory board, (ii) an ADR mechanism with non-binding decision and (iii) an ADR procedure with binding decision is included in the contract. With respect to the third stage of the renegotiation process, there are usually no contractual rules for the authority's voluntary termination. This leaves the authorities only with termination rights from contract law which are rather vague and need significant legal interpretation leading to considerable transaction costs in the event of termination. Nonetheless, there are a few projects which have voluntary termination rights clearly defined in the contract, one with a mechanism which is comparable to the authority break points used in the UK.

A comparison of approaches to renegotiation rules in the UK and Germany is provided in figure 1.

⁵³ For authority voluntary termination provisions, see HM TREASURY (2007, pp. 171-3).

⁵⁴ See 3P BERATERVERBUND ET AL. (2007a) and 3P BERATERVERBUND ET AL. (2007b).

	UK – Standardisation of PFI Contracts Version 4 (2007)	Germany – Model Contracts	Germany – Actual Project Contracts
Variation rules	<ul style="list-style-type: none"> • rules differentiated according to value <ul style="list-style-type: none"> - small: (output-oriented) options - medium: (input-oriented) options - large: tender, expert or benchmarking 	<ul style="list-style-type: none"> • negotiations based on contractor's cost estimate 	<ul style="list-style-type: none"> • frequently, negotiation clauses • in some cases, options or tender requirements
Dispute resolution	<ul style="list-style-type: none"> • three-stage process <ul style="list-style-type: none"> - negotiations within the project with higher hierarchy levels - expert resolution or other form of non-binding alternative dispute resolution - binding ADR or court resolution • contractually defined time limits for individual stages 	<ul style="list-style-type: none"> • three-stage process <ul style="list-style-type: none"> - project advisory board by the project parties - conciliation - arbitration (typically no recourse to courts) • no time limits for individual stages 	<ul style="list-style-type: none"> • clauses typically identical with model contracts
Termination	<ul style="list-style-type: none"> • authority voluntary termination with compensation based on <ul style="list-style-type: none"> - market value or - parameters from financial model • authority breakpoints with contractually defined compensation amount as option 	<ul style="list-style-type: none"> • no authority voluntary termination right in the contracts • recourse to (vague) contract law provisions 	<ul style="list-style-type: none"> • typically no authority voluntary termination right in the contract • sometimes, authority break points

Figure 1: Comparison of renegotiation rules in selected markets

5.3) Discussion

Renegotiation rules in the surveyed markets show different degrees of development. For this observation, there are several possible explanations. For example, it is reasonable that contract rules are improved over time and with accumulating experience in a particular market.⁵⁵ Therefore, it is not surprising that renegotiation provisions are comparatively more sophisticated in the UK where the PPP approach has been used longer and for a larger number of projects. Furthermore, dissemination of know-how about the comparatively complex tasks of developing long-term contracts like those used in PPP projects may be less difficult in a country where the PPP program is relatively more centralized. In the UK, the central government provides funds for most of the projects, even those that are implemented by local authorities.⁵⁶ When administrations apply for funding, they have to comply with central government's guidance on the appropriate design of projects and contractual rules.⁵⁷

In Germany, in contrast, local authorities who are responsible for most of the projects are relatively free in the design of their respective project. In this environment, contracting with lawyers may be

⁵⁵ For an analysis of how contracting parties learn to contract over time, see MAYER / ARGYRES (2004) and ARGYRES / MAYER (2007).

⁵⁶ See CIPFA (2007).

⁵⁷ For a description of the application process, see 4Ps (2006).

more problematic as they have an incentive to provide rather vague provisions so as to create a need for legal advice during the project. Additionally, this institutional framework may be less suited to deal with political-economy problems. As an appropriate contractual renegotiation design may increase the bidding price by risk transfer to the contractor, politicians in an individual project, who might favor presenting a low-cost project to the public and monitoring institutions, may have an incentive to avoid using more sophisticated rules. Furthermore, it has to be considered that costs for appropriate contract design have to be incurred before the contract is signed. As the consequences of underdeveloped contract rules will be revealed only in the long term (which may be well beyond the current legislative term), politicians may not internalize these costs. Appropriate model contracts might provide sufficient guidance for responsible authorities and monitoring institutions.⁵⁸ However, up-to-now no government body or other institution have been willing to spend ample funds on developing sophisticated contract provisions.

6) Conclusions

The purpose of this paper has been to highlight the importance of renegotiations for the efficiency of long-term contracts like those used in PPP projects. We assumed that the institutional environment in developed countries sufficiently inhibit renegotiations initiated with opportunistic motives. Through this, renegotiations are in most of the cases used for a beneficial adaptation of original service provisions to a changing environment. Based on this assumption, we analyzed contractual renegotiation design as a major factor driving the efficiency of implementing contract amendments initiated by the principal of the relationship, i.e. the responsible public authority. PPP and other long-term contracts typically include a clause that provides the authority with an unfettered right to request changes. Hence, discussion could be focused on the determination of an appropriate compensation. We showed that a staged process with variation procedures, dispute resolution mechanisms and termination rights might be well-suited to achieve this agreement.

Clauses used in practice show diverging degrees of sophistication. Whereas standard contracts in the UK have been revised in a way consistent with the normative analysis presented above, provisions in German contracts leave room for improvement. This hints at the complexities faced by a principal developing contractual provisions for long-term contracts. Furthermore, it highlights the need for appropriate project preparation. While costs for adequate contract design have to be incurred on a short-term basis, the negative effects from inappropriate clauses are experienced mainly in the long term. Such inefficiencies may be dealt with at program level, e.g. by providing expertise to individual projects or developing standard provisions that may be used by the authorities at the local level. Although developed in a public sector context, results are also applicable to transactions entirely taking place within the private sector.

⁵⁸ With central provision of contract clauses or guidelines, the lobbying problem will have to be dealt with.

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