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Renegotiating Public-Private Partnerships

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ABSTRACT

The renegotiations of public–private partnership (PPP) contracts are commonly considered to be one of the pitfalls of PPPs, as they tend to undermine their (ex ante) efficiency. A renegotiation occurs when specific events change the conditions of a concession, frequently leading to a financial claim from the private sector on the public sector. This paper examines the Portuguese experience with PPP renegotiations by means of a unique panel data of 254 renegotiation events from 1995 to 2012. We find evidence of opportunistic bidding for PPP contracts, which is ex post – after the contract is won and the competition eliminated - leading to renegotiations to increase revenues. Renegotiations last on average 1.8 years. Majority governments are more prone to renegotiate and have more political clout to limit the renegotiation duration. There is no evidence of more renegotiations in election years or when there is a change in government. A better institutional framework, defined as a low country risk, a strong rule of law, and lower corruption, tends to reduce the probability of renegotiations. There is also evidence that at times of higher corruption, more renegotiations occur. The project's leverage decreases the renegotiation duration. Strong initial bidder competition for a PPP contract leads to long subsequent renegotiations between the winning private party and the government.

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Renegotiating Public-Private Partnerships

1. Introduction

Over the last few decades, Public-Private Partnerships (PPPs) have been increasingly used by governments around the world to finance and manage complex (infrastructural) operations. PPPs are long-term contracts (typically covering 30–40 years), whereby the private sector assures the construction of infrastructure and maintains a service, for which the public sector pays. There is an increased interest in the strategic aspects involving the delivery of public services and PPPs and the organizational choices made by public and private actors (Rainey & Bozeman, 2000; Boyer et al., 2016). One of the main (problematic) issues with PPPs are their frequent renegotiations, which can arise at any stage in the lifecycle of a PPP (see Miranda Sarmento & Renneboog (2016) for details on how a PPP is managed). PPP renegotiations occur when specific events change the financial conditions of the concession, which mainly occurs when the public authority is asked or proposes to compensate the project firm for a loss of revenue or unanticipated costs. Alternatively, renegotiations can be initiated by the private sector; this is mainly the case when the concession's financial conditions deteriorate in such a way that the private company may slip into financial distress.

One of the criticisms of PPPs is that the high rate of renegotiations undermines the credibility of the initial bids by the private sector: bidding parties may anticipate renegotiations (that will subsequently tilt the balance in their favour), which affects the (ex-ante) bidding competition and thus the (ex post) efficiency of PPPs. PPP contracts are by nature more prone to renegotiations, because they are long-term, complex, and incomplete contracts. In addition, they occur in heavily regulated sectors that are sensitive to political and circumstantial changes. These factors, combined with high levels of investment, result in greater uncertainty.

Understanding the renegotiation process is a key aspect of ex-ante PPP contracting, the more so as only few (and geographically disperse) studies have touched on this subject.

In the context of PPP renegotiations, several management and strategy theories are relevant (a schematic overview is presented in Table 1). First, contract theory applies as renegotiations are a natural response to uncertainty embedded in long-term and incomplete contracts (Hart, 1990, 2003). Second, political economic theories is important as PPPs are particular arrangements that involve the public sector. Renegotiations can hence be induced by political pressure in the face of elections (Williamson, 1989; Das et al., 1996, Guasch et al., 2003). Opportunistic behaviour leading to renegotiations can come from both governments eager to change contracts in order to seek voting support from electorate, or firms taking advantage of political cycles and electoral pressure on governments in order to obtain additional rents. Third, legal and institutional theory matters because the quality of regulation, the efficiency of the judicial system, and the degree of corruption in an economy shapes the framework in which contract design and renegotiations are taking place. Finally, learning theory may be relevant for both the public and private sector considering the high frequency of renegotiations in PPPs (Ariño & Torre, 1998; Ariño et al., 2014).

[Insert Table 1 here]

In order to examine how PPPs renegotiations can be explained by the above theories, we resort to the Portuguese case. Portugal has set up many PPPs since 1993 and is the European PPP leader (in terms of the large PPPs as a percentage of GDP). As consequence, we have a sufficient number of observations to quantify renegotiation probabilities and motives. Our unique, hand-collected, and proprietary dataset with 254 renegotiations events between 1995 and 2012 enables us to answer a set of research questions related to the above theories: *Do uncertainty and contract incompleteness increase the probability of renegotiations? Does opportunistic behaviour arise in terms of contract restructuring prior to or in the wake of*

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elections by both the public and private parties? Does a better legal and institutional environment and stronger rule of law reduce the occurrence of renegotiations? Does learning arise from experience in the initial bidding process and from renegotiations, resulting in legal responses, better PPP supervision by independent courts of audit, more efficient contract design, and, over time, in fewer renegotiations?

We intend to look at the managerial implications of the answers to the above questions and how the insights generated by this paper can help private firms and governments to improve the management of PPP contracts. About half of renegotiations are initiated by the private sector (123 cases versus 122 renegotiations initiated by the government). We show that complex, long, and by nature incomplete contracts reflect uncertainty, leading to frequent renegotiations, particularly initiated by the public party. There is also evidence of opportunistic behaviour by both the government and the private parties, but it is especially private firms with strong political connections that successfully renegotiate contracts in the year or and the year prior to elections, and when there has been a recent change in the governing political party. A strong institutional environment affects the likelihood of renegotiations: a better judicial system leads to more renegotiations because the efficiency with which claims are settled in court can encourage both PPP parties to engage in renegotiations in the knowledge that a (mere) threat to go to court may encourage reaching a negotiated result out of court. Also, low corruption is related to fewer renegotiations. Finally, we also document that the frequency of renegotiations does not go down over time. The private sector seems to have found a beneficial equilibrium, which enables to receive of what they demand in renegotiations, as reflected in the bargaining power rate.

In order to discuss the consequences of renegotiations for private and public management, we examine the strategic behaviour of each party. We analyse the initial bidding process, including how the private companies bid and learn over time and study the financial claims

brought forward in renegotiations by the private sector in order to assess to what degree these demands are met by the government. For the public sector, we focus on how governments learn from the PPP experience by scrutinizing the Court of Audit's initial and follow-up reports and by assessing the degree to which their recommendations have been followed up by the government in terms of changes in the PPP laws and interpretation and execution of PPP regulation. We also examine the renegotiation clauses in the PPP contracts and how they were adjusted over time. The Court of Audit suggests that there are clear pitfalls in the PPP process for the public sector, and that changes in PPP legislation have been ineffective. Also, the learning on PPP contract design by the public sector has been limited, as the clauses on renegotiation conditions did not change for over 20 years, in spite of the very high renegotiation frequency. The governmental copy-and-paste approach to contracts may reflect the lack of legal/technical abilities and foresight on the part of the executive public entities (and possibly also the pressure to sign these contracts to please the electorate or the political influence of the private companies' shareholders).

This paper contributes to the management literature on long-term contracts that involve both public and private parties. Rational arguments aiming at the long-term (financial) viability of the agreement are not the only triggers of (the very frequent) contract renegotiations, as we show that opportunistic behaviour by both the public and private sector can arise (especially in an electoral context and when political connections prevail), that the legal and institutional context matters, and that learning at the bidding and the renegotiation processes is limited.

This paper is organized as follows: section 2 presents the literature and the hypotheses. The methodology and data are described in section 3. The results are in section 4, and a discussion on learning is presented in section 5. The conclusions and policy implications are discussed in section 6.

2. Literature and hypotheses

2.1 Management theories of contracts

The design of contracts and relationships between parties has been widely discussed in economic and management theory, since the seminal work by Macaulay (1963) on contracts, as a set of agreed-upon terms for a product or service with necessary safeguard mechanisms (Harrison, 2004). Within management theory, the focus has moved to efficiency and performance of contractual relations (Kern et al., 2002) and is less on how contracts are designed and how their structures have evolved (Argyres et al., 2007; Bercovitz, & Tyler, 2014). Weber & Mayer (2011) state that how a contract determines the ongoing relationship between parties is still a disputed issue.

The renegotiation literature has largely concentrated on the relationship between concessionaires and the public grantor agencies or governments from the perspective of contract theory and contract incompleteness (Lazzarini et al., 2008; Tirole 1986; Williamson 1979, 1989) and has mainly concentrated on transaction cost economics (TCE), incomplete contracts, and uncertainty. Contracts are by definition incomplete to the extent that it is not possible to anticipate all future events for any given contractual arrangement (Hart, 2003). Hence, incomplete-contracts theory argues that renegotiations result from the need to adapt contracts to a changing environment or new conditions unforeseen in the initial agreement or only becoming verifiable ex post (Grossman & Hart, 1986). TCE argues that transactions are facilitated when contracts are aligned in that one party's expectations agree with the other party´s obligations. At the same time, contracts must provide the right incentives to fulfil obligations and lay the basis for dispute resolution in case one party reneges on its obligations (Argyres et al., 2007; Lumineau et al., 2012). On the topic of renegotiation of contracts, TCE argues that contracts represent a set of clauses and safeguards that protect each party from opportunistic behaviour of the other party (Williamson, 1996). However, several studies also

point out that attempts to be contractually exhaustive in terms of including safeguards to prevent opportunistic behavior may end up potentiating such events (Dyer & Singh, 1998; Ghoshal & Moran, 1996; Malhotra & Murnighan, 2002). The reason is, as argued by Weber & Mayer (2011:53), "Scholars in other research domains have argued that in attempting to mitigate threats from opportunistic behavior, formal contracts actually serve to foster distrust and bring about the very actions they are designed to prevent."

A higher degree of uncertainty may lead to greater efforts at providing safeguards in contracts or, failing this, to less detailed contracts reflecting the lack of knowledge with which parties initiate their transaction (Argyres et al., 2007). Crockers & Reynolds (1993) show that transactions characterized by greater uncertainty tend to be more incomplete even after attempts to address potential contingencies. Tirole (1999) confirms that renegotiations necessarily occur because the cost of previewing almost all possible events is prohibitively high, but on the other hand, an abnormal frequency of renegotiations may highlight a poor contract design and possible excessive opportunistic behavior by at least one of the parties (Guasch et al., 2003).

2.2 Renegotiating of PPPs

Unlike the literature on general contract renegotiations, that on PPPs (and particularly on their renegotiations) is not abundant; private firms rarely share information about their agreements, and they give even less information about their renegotiation decisions and the outcomes. The few empirical studies about renegotiations only address government procurement (Guasch et al., 2003, 2006, 2007; De Brux, 2010). Latin-American PPP renegotiations have been studied by Guasch et al. (2003), who examine both the contract clauses and the characteristics of the economic and institutional environments.

PPP renegotiations can be defined as a revision of the concession contract that affects and alters the financial balance of the project firm (Guasch et al., 2007). It should be noted that this definition includes only substantial departures from the original contract and not contractually anticipated changes, such as e.g. tariff adjustments. Some authors consider a renegotiation event as a natural and typical aspect of the PPP process (Engel et al, 2009), and as a way to address inefficiencies from contract incompleteness and to improve initial forecasts and plans. However, the majority of authors view a high frequency of renegotiation events as an indication of PPP failure usually leading to an increase in public payments, an increase of the users´ costs, or a reduction of service (or any combination) (Guasch, 2004). Frequent PPP renegotiations ought to be avoided, and if they occur, they should only be a response to financial distress or lack of efficiency (Guasch & Straub, 2006).

2.3 Theories and hypotheses on renegotiations

2.3.1 Uncertainty and renegotiations

Contractual agreements are inherently incomplete which leads to renegotiations, whatever the ex ante efforts of the contracting parties to set contract terms exhaustively foreseeing future states of the world (Carson et al., 2006). Ideally, contractual arrangements of a PPP project should be dynamic, corresponding to the evolution of risks as the future unfolds and new information dissipates uncertainty (Ariño & de la Torre, 1998; Harrison, 2004). In practice, however, effective communication mechanisms between partners are seldom present; private and public sectors find themselves more often in adversarial rather than cooperative positions (Domingues & Zlatkovic, 2014). Consequently, although the renegotiation of contracts involves costs, the revision of the contractual terms of trade are a tool for adapting to changes in uncertainty.

Given the nature of PPP contracts, they are by definition incomplete, but also usually inflexible when faced with unexpected circumstances (Spiller, 2008). In particular, PPP contracts are often highly prescriptive and excessively rigid (e.g., long-term traffic forecasts are set as a basis for financial compensation for concession lasting 25 years or longer), which leads to situations where the public grantor is bound by contingency clauses that may no longer apply (Domingues & Zlatkovic, 2014). This issue imposes various costs such as ex-ante transaction costs, information and bargaining costs, and also ex-post transaction costs of monitoring and contract enforcement. The incompleteness of PPP contracts have led to some studies on renegotiation of contracts in less developed countries (Guasch, 2004; Guasch and Straub, 2006; Guasch et al., 2008; Engel et al., 2009) as well as in developed countries (Spiller, 2009). From the above, we hypothesize that *uncertainty and contract incompleteness increase the probability of renegotiations (Hypothesis 1).*

2.3.2 Political economics theory and opportunistic behaviour

Renegotiations may also stem from opportunistic (ex ante) behavior from bidding private parties since bidders who assume that renegotiations are likely to occur may bid more aggressively (Williamson, 1989, Das et al., 1996, 1998). Subsequently, after the concession has been won, renegotiations can occur without further competition from the other initial bidders. This way, an opportunistic bidder uses renegotiations to compensate his initial under-bidding by ex post additional rents (Guasch, 2004). Likewise, overly optimistic traffic forecasts in transportation projects - possibly explained by an optimism bias - are often a deliberate deception by project promoters who are interested in getting projects started (Flyvbjerg et al., 2002). At any point in time over the contract's duration, an (opportunistic) bidder stands in a strong position to renegotiate because the interruption of a public service is often (politically) unacceptable because it would trigger high social costs, which encourages the government to succumb without much resistance in renegotiations with the private parties. The inverse case

could also arise; then, the public sector holds a lot of bargaining power, which mainly happens when the private company's financial equilibrium is endangered, and bankruptcy would wipe out shareholders' wealth and/or reputation. Consequently, contractual clauses that regulate the risk allocation matrix and the terms of contract termination, set financial guarantees, and determine the key performance indicators or investment requirements, affect the likelihood of renegotiations (Domingues & Zlatkovic, 2014).

Political cycles may have a bearing on renegotiations: First, tight public budgets typically encourage the public sector to pass on large investment obligations to the private sector by means of PPP contracts, possibly including governmental guarantees. These guarantees can induce opportunistic behavior as it provides incentives for the private party to be less efficient, which could subsequently lead to seeking additional rents from the public sector (Guasch et al., 2003, 2008). Renegotiations of existing PPP contracts by the private sector may then be characterised by less meticulous screening of the private party's financial arguments, and possibly also overgenerous behaviour by the public sector. Second, politicians often consider PPPs as the perfect tool for delivering infrastructure while avoiding up-front payments and making off-balance-sheet investments. Third, the renegotiations of PPPs also seem to depend on electoral cycles: incumbent governments invest or renegotiate in order to guarantee re-election, and newly-elected officials may renegotiate from a political ideological perspective in order to meet social demands in a way that is different from the past (Engel et al., 2009; Guasch & Straub, 2009).

A change in government is also likely to affect renegotiations since it represents a breach in the past dialogue and of implicit contracts between the public and private sectors (De Brux, 2010). In this context, what may matter for renegotiations of PPPs are the ideological inclination – left- or right-wing – of the government in power, the democratic strength of the incumbent government (absolute majority, coalition-based majority, or minority government),

and the incumbent government's expectations that it may lose power at the next elections. For instance, a majority government may be less transparent in PPP renegotiations since it does not have to promote consensus or seek support from the opposition. Right-wing governments often have stronger ties with the private sector and may hence be more lenient in renegotiations. Therefore, we hypothesize that *the political situation and electoral expectations can induce opportunistic behaviour by both the public and private parties and affect the likelihood of renegotiations (Hypothesis 2).*

2.3.3 Institutional and legal theory

Another key issue affecting renegotiations is the (lack of) the regulatory and institutional quality, which can induce (or dismantle) trust between partners. Regulatory stability and a high level of institutional quality is positively correlated to corporate investments (Hoffmann et al., 2009). The existence of a law that regulates procurement, public-private collaborations, contract design, follow-up PPP investments, and renegotiations is essential. Specifically, when faced with changing circumstances, contracts address uncertainty through renegotiation clauses, which make it possible to revise the terms of trade under the same contract instead of changing the contract itself. This aspect stresses the importance of designing long-term contracts that have an economic and political rationale (Saussier, 2000). There is evidence that the absence of an efficient regulator affects the likelihood of renegotiation (Cruz & Marques, 2013). Past experience shows that there seem to be few feedback loops that lead to learning at the level of the regulator; Moore et al. (2014) show that renegotiations do not fundamentally alter the regulatory regime. Not just regulation matters for renegotiations, but also the quality of the rule of law, namely the extent to which disputes can be resolved fast, reliably, and fairly in a court of law. The mere possibility (or threat) to take renegotiation cases to an efficient court may affect renegotiations and their duration (Guasch et al., 2003, 2006).

The rule of law and institutional governance is typically captured by indices (on e.g., bureaucratic quality, government effectiveness) developed by either supranational organizations or non-profit think tanks (e.g., The World Bank, Transparency International, PRS group). In these indicators, corruption is often an important factor for two reasons: first, better governance necessitates a lower level of corruption. Second, the influence of country-level corruption affects who initiates the renegotiation: a more corrupt environment leads to more firm-led renegotiations (Guasch and Straub, 2009).

Finally, a country's fiscal constraints can induce opportunistic behaviour by a government who opt for PPPs to avoid public expenditures weighing on the budget. The budget temptation shifts the negotiation power to the private parties, as the public party is more interested in avoiding short-term costs by postponing payments and easing the present fiscal burden while ignoring the total discounted costs over the whole contract duration. This leads the following hypothesis: *A better legal and institutional environment reduces the occurrence of renegotiations (Hypothesis 3).*

2.3.4 Learning theory

On the topic of learning and contract design, Mayer & Argyres (2004) argue that although renegotiations can be regarded as undesirable due to high transaction costs, a successful renegotiation can reduce the probability of future (repetitive) renegotiations in the decades to follow since this first renegotiation is to realign the contract terms with the long-term expectations about the viability of the project by the parties involved. Argyres et al. (2007, 2012) provide evidence that contract structures do evolve over time in ways that are consistent with learning behaviour. Mayer & Argyres (2004) also document that changes in contracts are explained not only changes in the business environment, but are also induced by the two parties gradually learning how to work together. This learning is incremental and local, with contracts

being a repository for knowledge. As mentioned by Ariño & Torre (1998), initial contracts are the outcome of a first interaction, which results in both parties being satisfied with the terms.

However, the development of a project necessarily establishes learning processes that result in a re-evaluation of those initial conditions. A new sequence of negotiations and commitment takes place that may lead to a set of revised conditions. Successful alliance projects are highly evolutionary and have a sequence of interactive cycles of learning, re-evaluation, and readjustment (on the opposite side, failing projects lack learning and adjustment) (Doz, 1996; Kumar & Nti, 1998; Anand & Khanna, 2000; Cruz & Marques, 2013; Curhan, Elfenbein & Xu, 2006). Therefore, we expect that *frequent PPP renegotiations lead to contract adjustments which reduce the probability of renegotiation (Hypothesis 4).*

Table 2 provides a schematic overview of the four main hypotheses and the proxies we will employ in a multivariate analysis.

[Insert Table 2 here]

3 Data, variable description, and methodology

In order to determine what drives the probability of a renegotiation and the probability that a renegotiation is initiated by the government (as opposed to the private sector), we estimate probit (and logit) models in a panel data setting, whereby we label each year as either a renegotiation or no-renegotiation event-year. Specifically, we assume that the model takes the form $\Pr(Y = 1 \mid X) = \phi(X'\beta)$ (1), where Pr denotes the probability, and Φ is the cumulative standard normal distribution function, and the parameters β are estimated by means of maximum likelihood. Suppose an auxiliary random variable $Y* = X'\beta + \varepsilon$ (2) exists with $\varepsilon \sim N(0, 1)$, then *Y* can be viewed as an indicator for whether this latent variable is positive:

$$Y = \begin{matrix} 1 \ if \ Y* > 0 \ i.e - \ \varepsilon < X'\beta \\ 0 \ otherwise \end{matrix} \qquad (2)$$

In our model, renegotiation events take the value of one, and the years in which a renegotiation was going on are zero, as are the non-renegotiation years of renegotiated PPPs (26 of a total of 35) and all the concession years of the nine PPPs that were never renegotiated. We used random-effects and population-averaged probit models and cluster standard errors at the PPP (project) level. The analysis hinges on a unique panel dataset of 254 renegotiation events over the period 1995 to 2012. The data were hand-collected from each of the 35 reports from the Ministry of Finance. Although they are not publicly available, the previous Portuguese government granted us access (with a confidentiality agreement for individual cases). We were also able to collect information from the initial and renegotiated PPP contracts and their annexes, which are also not publicly available. Furthermore, we also gathered data on the initial bidding process—who has participated as well as who has won or lost in the first and second bidding rounds—from the reports of the commissions that conduct the bidding and renegotiation processes.

To test our first hypothesis, on the relation between PPP contract uncertainty and incompleteness and the likelihood of renegotiations, we used the following as explanatory variables (the X vector of equation (1)): *Log of capex* stands for the log of the total investment required for each PPP. Project investment size may be related to renegotiations as large projects are more likely to experience cost overruns, considering that they are more complex, less standardized, and more prone to contingencies (Guasch, 2003, 2008; Cruz & Marques, 2013; Moore et al., 2014). *Contract duration* captures the number of years of each PPP contract and is expected to be positively related with a higher incidence of renegotiations because a long contract duration induces higher uncertainty regarding economic, technological, social, or political evolutions and is more prone to instability and forecast failure (Guasch, 2004; Cruz & Marques, 2013; Domingues & Sarmento, 2016). *Debt to Capex* (*Leverage)* represents debt as

a percentage of the total investment. High initial project financial leverage increases the probability of financial distress and may hence necessitate renegotiations on the recapitalization of the PPP company or on incoming cash flows (Moore et al., 2014). High debt financing increases the risk that the net operational cash flows are at certain point in time not sufficient, can lead to a liquidity problem in the PPP, and may consequently trigger a renegotiation. In addition, a high level of debt—despite being common in project finance—can expose the project to shocks and crises in the financial markets with consequences for the cost of debt and financial sustainability of the project (Miranda-Sarmento & Renneboog, 2016; Kim et al., 2017). *EIB* is a dummy variable indicating whether the European Investment Bank has participated in the project as a lender (which is when the variable equals 1) or not (when EIB equals zero). The loans awarded by the EIB are usually large, have long maturities, are granted at low interest rates (which could be considered as mild subsidization of major European infrastructural projects), and could enhance the credibility of the project and trust such that other (international) financial institutions also grant loans at favorable terms. Hence, EIB loans are expected to have a positive impact on the project's financial structure, borrowing rate, and sustainability, and hence reduce the probability of renegotiations.

The models testing hypothesis 1, also include the following control variables: *Operational stage* is a dummy variable equal to zero in case the renegotiation occurs during the construction period, and one for the operational period. Especially, during the construction period, large infrastructure projects are prone to cost overruns (Flyvbjerg et al., 2002), but renegotiations may occur more in the operational stage as this is the longer period of the concession and the further in the future. Typically, the construction takes 4-5 years, and the operations last for at least 20, often even up to 30 years. *Availability payment* is a dummy variable equal to one if the payment to the private sector in the operational phase is a fixed annual rent (as long as the asset is in a condition to be used according to the contractual requirements) and zero if the

payment to the private sector is based on users' payments for the service offered. The type of payment scheme in the exploitation phase, especially when the revenues of the private party depend on demand of the service, can be a source of uncertainty, which augments the probability of renegotiation (Guasch et al., 2003).

According to our second hypotheses, opportunistic behaviour from both parties around elections can trigger more renegotiations. Our political explanatory variables are these: *Election year* is a dummy variable with a value of one when renegotiations were started in an electoral year. We also examine the impact of the years prior and subsequent to elections. Opportunistic renegotiations may arise from the side of the government because it may be interested in pleasing voters in order to influence the election outcome. An (also opportunistic) initiative to renegotiate may also come from a private firm that wants to bank on its increased negotiation power in election times. The idea is that the private party takes advantage of the fact that the government may be more prone to give in to its demands because the government can simply not afford problems with a public service in election times (Guasch et al., 2007, 2009). Therefore, we expect to see positive coefficients for the election time variables. *Foreign shareholder* equals one if the majority of the equity capital is owned by foreign companies and zero otherwise. Political connections of the private parties can affect renegotiations (Guasch et al., 2004), and we expect that when foreign firms are the main shareholders in a PPP consortium, the lack of political ties is negatively related to the probability of renegotiations.

When testing this hypothesis, we also include the following control variables: *Change in government* is an indicator variable equal to zero if after an election, the political party remains in office, and one if there was a change in government. A new government can reconsider the previous government's decisions as it may have different priorities or political motives, and thus commence its own renegotiations or may be more prone to respond to a private sector initiative. We also use *Right-wing governments* (or *center-right coalition governments*) whose

indicator variable takes a value of one when the government is on the right of the political spectrum or on the center-right in case of a coalition government. This type of government is expected to be more oriented towards economic efficiency and less towards social equality. Hence, right-wing governments, which usually have better ties with the private sector are more disposed to enter renegotiations. Political connections can indeed affect investment decisions as Fisman (2001) and Hong & Kostovetsky (2012) show for 'red' and 'blue' US firms, i.e., firms with Republican or Democratic ties, respectively. We also include the variable *Majority Government* (which equals one if the government at the time of a renegotiation has a parliamentary majority, and zero if not) because a majority government has more decision clout when conducting negotiations, which can induce a positive correlation with the probability of renegotiation (Cruz & Marques, 2013). Finally, we define the *Ascendi* variable (which is one when the PPP belongs to the Ascendi Group and zero if not). Ascendi is the largest construction group involved in Portuguese PPPs and has strong political ties as its board comprises current and former politicians from both the centre-left and centre-right political parties (e.g. for several years Mota-Engil, the main shareholder of Ascendi has had as CEO a former top politician, several times a former minister, and at one time even a former minister of transport). Of the 254 renegotiations events, Ascendi accounts for 89. We hence expect the Ascendi variable to be related to more frequent renegotiations, reflecting Ascendi's negotiating power in road sector PPPs.

To test our third hypothesis, namely that a more shareholder-oriented legal environment reduces the likelihood of renegotiations, we include the following as explanatory variables in our models: The *2006 PPP law* (a variable equal to zero if the renegotiation has occurred before the approval of the 2006 PPP law, and equal to one subsequently) was expected to strengthen the legal ground to conduct PPPs and facilitate contract design leading to fewer renegotiations. In 2003, the first PPP law had been accepted in the Portuguese parliament and had established

a general framework regarding the concept, preparation, bid, adjudication, and monitoring of PPPs. Still, given that the 2003 law did not include much guidance on renegotiations, this law was amended in 2006. The aim was to increase cooperation among public sector entities that dealt with PPPs and to improve the mechanism of controlling PPPs in order to enhance transparency and hence reduce the number of renegotiations. In addition, the negotiation procedures and mechanisms to share the benefits between the public and private sector following renegotiations were outlined. *Low Corruption* is a dynamic variable—a high index score points at low perceived corruption—that captures whether agents believe that governmental decision-making is subject to influence. Hence, high corruption is expected to augment the odds for renegotiations as in this environment additional rents can be captured (Kaufman et al., 1999; Guasch et al., 2004, 2007, 2009; Kwon, 2014; Domingues & Sarmento, 2016). The *Political risk* rating is a composite of political, financial, and economic risks and captures a country's political stability (the higher the index, the lower the risk). A more stable political situation is expected to reduce the probability of renegotiations because there is less room for opportunistic behaviour by either the public or private party. The *Rule of law* index represents how easy it is to enforce contractual claims in a court of law and captures the judicial limits of government to realize its policy program through the legislative arm of the government. An efficient judicial system will lead to more renegotiations because, if the renegotiations come to a stalemate, one of the parties can take the case to court to force a solution (Guasch et al., 2003; Domingues & Sarmento, 2016). We use the following variables as controls when estimating the models related to hypothesis 3: The *Contract viability* index represents the risk of unilateral contract modification or cancellation and, at worst, of outright expropriation of privately owned assets. The *Fiscal deficit* (representing binding budget constraints) and the level of *public debt* (both standardized by GDP) may increase renegotiation frequency by governments seeking to postpone expenditures.

To test our fourth hypotheses, namely, that learning and experience reduce the probability of renegotiations, we include the following variables in our models: *First renegotiation* (which equals one if the renegotiation event is the first PPP renegotiation and zero for subsequent renegotiations) and the *number of renegotiations* (capturing the number of previous renegotiations) are both learning variables. We know that the average PPP contract is renegotiated multiple times, but we expect that past renegotiation experience to reduce the probability of subsequent renegotiations (Ariño et al., 2014). *Years since the previous renegotiation* is the number of years since the previous renegotiation was started. We expect that a higher number of years since the previous renegotiation increases the likelihood of a renegotiation. As a control variable, we use the *concession age*, as we expect that a longer experience in managing the PPP from both parties reduces the occurrence of renegotiations (Domingues & Sarmento, 2016).

In relation to hypothesis 4 (on learning), we perform two additional tests: one is based on the bidding for PPP contracts, and the other on the financial outcome (compensation) of these renegotiations.

The bidding process of a PPP in Portugal follows the international standards, and the procurement process has not been subject to significant change over the past two decades (Miranda-Sarmento & Renneboog, 2016). In the bidding process for 21 PPP highways, we identified 25 companies that made at least one bid and together made 282 bids, alone or as part of a consortium. First, in order to examine if companies are learning from their previous bidding experience, we estimate an ordered probit model with the *Bidder's final rank* (after two bidding rounds) as the dependent variable, and the; *Bidder's experience in PPP bidding* (the number of PPPs a firm had bid for, to date), the *Number of bids won (previous winner),* and the *Consortium size* (the number of companies that are members of a bidding consortium) as explanatory variables. Second, we limit our sample to the two firms per contract bid that

survived the first initial bidding round and entered the second (and final) bidding round. We then estimate a probit model with as dependent variable a dummy variable capturing winning versus losing the bid.

We collected the financial compensation requested by the private firm in a renegotiation and the final amount agreed upon by the two parties for a subsample of 65 cases. This enables us to calculate the "*bargaining power rate*" of the private sector in each renegotiation, which is the difference between the requested and obtained financial compensation. Interestingly, in 50 out of 65 cases, the bargaining power rate is close to 100%, which means that the private sector received everything it had asked for. We run a pooled OLS model with the bargaining power rate as the dependent variable, and experience, electoral years, and political connections measures as explanatory variables (all defined above). Table 3 gives the overview of variable definitions, and Table 4 presents the descriptive statistics.

[Insert Tables 3 and 4 here]

4. Results

4.1 PPP Renegotiations

As mentioned before, Portugal has been a European leader in PPPs. The large number of projects led to a substantial number of renegotiations. Out of the 254 renegotiation events, the road sector accounted for 233 cases (Table 5, Panel A). A significant number of renegotiations took place during the operational stage (171 events), and in an election year (117 events). Forty-three per cent of PPPs were renegotiated in the first three years and 57% in the first four years. On average, the first renegotiation with a PPP takes place 3.5 years after the signing of the contract (see Table 5, Panel B). Table 6 (panel A) categorizes the renegotiations by motive and sector. The average time between a PPP contract and any renegotiation event is seven years.

When we only consider the 155 renegotiation events that occurred during the operational stage, the average time for the first renegotiation to occur is six years (see Table 6, Panel B)

[Insert Tables 5 and 6 here]

4.2 Determinants of PPP renegotiations

This section presents the results on the determinants of PPPs renegotiations and our four main hypotheses. Regarding our first hypothesis, our results tend to confirm that contracts with higher complexity, which are unavoidably incomplete, tend to increase the probability of renegotiations. We find that the renegotiation likelihood is highest in the operational stage, which makes sense because the operational stage starts several years after the initial (construction) phase and typically lasts much longer. Larger PPPs (with higher *Capex*) and projects with longer contract durations are more likely to be renegotiated, because such projects are more prone cost overruns (models (2) and (6) of Table 7). High leverage may signify that the financial structure is not stable enough, which increases the likelihood of renegotiations. We also find some evidence (albeit weak) that a PPP contract with an availability payment reduces the probability that a contract is renegotiated, which is expected as an availability reduces the uncertainty for the private party.

We also expect opportunistic behavior from both parties to increase the occurrence of renegotiations around electoral cycles (hypothesis 2). As expected, electoral cycles do indeed affect the likelihood of renegotiations (Table 7): they are more likely to take place in the electoral years and in the years prior to an election. This could reflect opportunistic behavior from both parties involved, as incumbent governments may be enticed to renegotiate in order to provide some benefits to the electorate (in the hope that they will be rewarded in the elections to come), while the private party may see a window of opportunity as governments in election mode cannot afford a disruption in the provision of a public service. We also document that PPPs in which the Ascendi group (which has strong political connections) and foreign

shareholders participate, have more renegotiations (specifications (2), (4), (6)). In untabulated results, we re-estimate these regressions for the sample of road PPPs only (as *Ascendi* focuses only on road PPPs and does not participate in other sectors) and then find a much stronger relation between renegotiations. We observe that when a majority government is in power, there is less scope for renegotiating.

For our hypothesis on the legal and institutional environment (hypothesis 3), we find mixed evidence (Table 7). On the one hand, while one of the aims of the *2006 PPP law* was to reduce the renegotiation frequency in PPPs, this law appears to be have been rather ineffective in this respect, possibly as a consequence of weak design and/or weak implementation. As we will discuss in section 5, there is a strong evidence of learning inability by the public sector. On the other hand, we find that the institutional environment matters: a better judicial system leads to more renegotiations because the efficiency with which claims are settled in court can encourage both PPP parties to engage in renegotiations in the knowledge that a (mere) threat to go to court may encourage reaching a negotiated result out of court. We have also found some evidence that in periods with lower corruption fewer renegotiations occur. The political risk and contract viability indices do not affect the renegotiation likelihood, and neither does the economic environment (here captured by the fiscal deficit and the level of the national public debt).

Our final hypothesis regards the learning process by both public and private entities. *First renegotiations* indicates that there is a high probability that a PPP that has never been renegotiated before will be renegotiated at one point in time and that the probability of subsequent renegotiations decreases (as shown by the negative sign of the *number of previous renegotiations*).

In Table 8, we examine what determines the probability that a renegotiation is initiated by either the government or the private party. Contract uncertainty appears to affect the public sector more than the private sector because longer contracts tend to increase renegotiations

initiated by the public sector as are PPP contracts with a demand payment (as opposed to an availability payment). Highly levered PPPs (high Debt/Capex) are also more often renegotiated by the government, unless the European Investment Bank is an important lender. While we have learnt from Table 8 that in the election year and the year prior to the election, more renegotiations arise, we document in Table 8 that it is the private sector that takes the renegotiation initiative in those years. It even does so after elections, as long as an election brings a new government from another political party (*Change in government*) to power.

We also document in Table 8 that government-initiated renegotiations take place more frequently when the private party consists of *foreign firms*, and when the *Ascendi* group is involved, a group which has by far the best political ties (to all political parties) and renegotiates more than the other private parties (Ascendi accounts for 89 of the total 254 renegotiations). It seems that Ascendi prefers the government to take the initiative, which could reflect strategic behavior in that Ascendi may use its political connections—its board members are (former) politicians—to influence the government to ask for renegotiations and hence tilt the bargaining power to its advantage. The negative coefficient on *Majority government* indicates less frequently start renegotiating PPPs. Finally, Table 8 also depicts that an increase in the number of past renegotiations does not lead to decrease in government-led renegotiations. This could be evidence, as discussed, that the private sector is more efficient than the public sector in learning from previous experience.

[Insert Tables 7 and 8 here]

4.3 Learning in the initial bidding process

We now examine whether learning from experience arises in the initial bidding process. Private parties (consortia) bid for the PPP contract with the government in a first round, which is followed by a second round of bidding by the two withheld private parties, usually those that

put in the highest bids in the first round (and were able to convincingly prove that they can comply to the quality requirements in terms of technical ability and financial stability). The variable *previous experience*, which consists of the number of times that a firm has participated in a PPP bidding process, is statistically significant and indicates that multiple participations to the bidding process does not lead to a higher final rank (model (1) of Table 9), but conditional on passing to the second bidding round, experience does matter in terms of ending up as the final winner of the bidding process (model (2)). When a bidder has won concessions in the past, his final rank will be higher, but past wins are no guarantee to continue a winning streak. The latter may be explained by the fact that, if firms have won several concessions, they can afford to make higher offers (as they can bear to lose a bid). We control for consortium size and see that larger consortia do not necessarily increase their chances to win the PPP contract. It should be noted that we control for firm and year fixed effects, which controls for time-invariant firm specificities and timing of the PPPs (such as electoral years). When we abandon firm-fixed effects and include the bidder's nationality as an explanatory variable, we find that Portuguese firms are ranked higher than foreign firms, but this does not translate in a higher probability to win. Ascendi, the Portuguese firm with the best political connections (see above), does indeed have a higher probability to win.

[Insert Table 9 here]

4.4 Renegotiations and the bargaining power rate

We examine how much a private party can extract in terms of financial compensation from renegotiations with the government. The bargaining power rate – the percentage compensation paid by the government as a percentage of the total compensation demanded by the private party - does not depend on renegotiation experience (models (1) and (2) of Table 10); neither the first renegotiation indicator variable nor the years since previous renegotiation (for subsequent renegotiations) are statistically significant. What does seem to matter is the timing

of the renegotiations: at and around the elections, the bargaining power rate is higher, which indicates that the private parties have more bargaining power or that the government is more likely to give in when they feel the pressure of the electorate. Surprisingly, negotiations with right-wing governments, which are expected to be more company-friendly, do not lead to higher extraction rates. Foreign shareholders extract lower rents in renegotiations, possibly because of a lack of political connections, which contrasts with the strongly politically connected Ascendi, which does have a high bargaining power rate (i.e., 100%).

[Insert Table 10 here]

5. Discussion

5.1 Bidding and renegotiation experience

When we examine the bidding process of 21 PPP highways, we note that several consortiums repeatedly bid on each project. Almost all the bidders are Portuguese and Spanish companies (with the odd French or UK firm). With regard to the Portuguese bidders, the most important group, Ascendi, was the winner in eight PPPs (the consortium won 38% of their bids) and came in second in the bidding twice (10% of their bids). Another important national consortium was created by two large Portuguese construction companies (Soares da Costa and Teixeira Duarte) and the Spanish company Dragados. This consortium won two PPPs (only 10% of the bids in which they participated). Similarly, another two large Portuguese construction companies (Somague and Edifer) joined forces (along with several mid-sized companies) and won two PPPs. Interestingly, the highway operator Brisa, a former state-owned enterprise that was privatized in the 1990s, has won four out of eleven bids.

The Spanish Cintra and Ferrovial groups are the private party in two PPPs, but its Spanish counterparts FCC and ACS never won a concession. It seems that Spanish firms were no longer

actively participating in the 2007-2010 tenders, possibly as a consequence of the financial and real estate crisis that severely hit the Spanish construction sector during that period.

Private firms participating in the bidding process can learn that it pays to behave 'strategically' in the initial bidding process, which is organized by the public sector and is inherently flawed. It pays for a firm to put in low bids for the contract because, in the case of a win, an unviable situation with very low anticipated profitability (or even financial losses) can be turned around by (multiple) renegotiations of the initial contract at the subsequent construction and operational phase of the project. At the time of the renegotiations, the competing firms (from the initial bidding phase) are no longer around such that the private partner only negotiates with the public sector. While a strategically astute firm can exploit the flawed bidding-renegotiation process, it is clear that this situation is not optimal from a social cost perspective and distorts fair competition.

5.2 Public sector learning

The results from Section 4 have indicated that the public sector is prone to participate (and even initiate) renegotiations more frequently in electoral cycles, and that the new legislation has proven ineffective in reducing renegotiation frequency. Opportunistic and strategic behaviour by politicians and private firms does not enable the public administration to be more effective. Why is the government willing to enter so frequently into renegotiations within a contract's duration and across contracts over time, why does the public sector gives in so frequently to the private sector (which often receives the full or almost full amount requested in a renegotiation)? All this suggests that the public sector does not seem to benefit from the experience in their decisions on and management of PPPs.

The Portuguese Court of Audits has regularly published highly critical reports on the entire PPP process. Most of this criticism has focused on the fact that PPPs have been used mainly as

an off-budget vehicles and not for reasons of efficiency. The Court has versed strong doubts about the quality of the PPP management by the government and has suggested the need to focus on the improvements in the governments' managerial quality and contract monitoring ability as well as in the microeconomic efficiency of these contracts and projects. The Court has stressed the need to clearly define the objectives and results of PPPs, on which basis the PPPs' efficiency, effectiveness, and sustainability can be assessed (in budgetary terms).

The second focal point of the Court regards the PPP contract design and the renegotiation clauses in particular. As PPP renegotiations can induce opportunistic bidding, one would expect that PPP contracts clearly delineate the conditions of renegotiations and that these clauses turn more specific over time. To examine this issue, we have compared: (i) the renegotiation clauses of contracts signed at different moments in time, e.g., those from the beginning of our sample period (2000) and those signed a decade later; and (ii) within PPP projects, the renegotiation clauses in the original contract and in the renegotiated contracts in order to examine whether learning in contract design takes place. For instance, we examine whether the clauses between the PPP Norte (signed in 2000) and renegotiated contract in 2010 are different, as are the clauses between Norte in 2000 and the PPP project Baixo Alentejo introduced in 2008. The Norte contract from 2000 allows for renegotiations under four different conditions: (a) 'Unilateral change imposed by the Grantor, of the conditions for the development of activities included in the Concession, provided that as a result of the same, it can be established that the Concessionaire, has a significant increase in costs or a significant loss of revenue'; (b) The 'occurrence of situations of force majeure'; (c) 'Legal changes of a specific nature, which may have a significant and/or direct impact on the income and expenditure relating to the exploitation of Motorways'; and (d) In cases 'where the right to restore the financial balance is expressly provided for under the Concession Agreement'. These renegotiation clauses are rather general and in the 2010 renegotiation contract, none of these

conditions were changed. Relative to the Norte 2000 PPP contract, the 2008 contract of "Baixo Alentejo" includes a new condition that is more favorable for the private sector: the private party will be compensated if the government were to decide to introduce tolls, because the base case in the contract was an availability payment and tolls would not be levied. All three contracts included the following key triggers for renegotiations, namely, the Annual Ratios on Senior Debt Service Coverage, Annual Ratios on Loan Life Coverage, and the annual IRR (to shareholders). Renegotiations were allowed, based on the previous conditions, if these ratios would be reduced by 0.01 percentage points relative to the base case. So, even a small worsening of the ratios can trigger renegotiations and, even after renegotiations, the criteria that can trigger renegotiations are exactly the same in both the initial and the renegotiated contracts. Finally, the clause on payments to the private party following a renegotiation states that the payment could take the form of a lump-sum, an annual increased compensation, or stable payments over an extended concession period, and is identical in the three contracts.

When we study the clauses on renegotiations, their key-criteria and payment firms for 35 randomly selected PPP primary and renegotiated contracts, we always find (nearly) identical clauses. We conclude that the PPP contract design and renegotiation clauses do not cater to the specificities of the each PPP project, and that no learning has occurred on the public side of the PPPs for (renegotiated contracts) and across contracts over time. It seems that a simple copy-paste approach has been applied in this respect considering the lack of changes in the above clauses and criteria over the last 15 years. The reason may a lack of legal/technical ability and foresight on the part of the public entities, the pressure to sign these contracts to please the electorate, or the political influence of the private companies' shareholders. Argyres and Liebeskind (1999) suggest that governance inseparability may be related to the government's inertia to change PPP contracts; they refer to "a condition in which a firm's past governance

choices significantly influence the range and types of governance mechanisms that it can adopt in future periods".

6. Conclusions

We have studied the renegotiations of Public-Private Partnership contracts in Portugal, where PPPs are most frequently used (per capita) relative to the rest of Europe renegotiated. The Portuguese case enables us to test several management theories that can explain what factors affect renegotiations, who initiates renegotiations, whether electoral cycles and political circumstances play a role, and whether learning from PPP (renegotiation) experience leads to more effective contracts and renegotiation clauses. Our first hypothesis regards the relation between the uncertainty of incomplete contracts (due to large and complex projects) and higher frequency of renegotiations. We find strong evidence that the degree of contract incompleteness (proxied by the contract length, and size and complexity of the investment) induces more renegotiations, which also occur more often at the operational stage of the PPP – the longest phase (often 25-30 years) and furthest away from the point of the contract design.

We also find strong evidence of opportunistic behaviour around elections (our second hypothesis), either from governments seeking to win elections or private firms eager to extract additional rents to increase renegotiations. Most renegotiations are initiated by private firms in electoral cycles – mostly the year of or the year before elections. This may reflect that the government expects to be rewarded by its voters for benefits arising from the renegotiation (e.g., lower tolls) but also that the private party times its renegotiations opportunistically and targets politically sensitive times in which the government cannot afford a service breakdown of public services. Just after a change in government, private firms also try to renegotiate contracts by taking advantage of ideological differences between governments. There is also

evidence that firms with strong political connections tend to renegotiate more. Our third hypothesis relates legal and institutional infrastructure to renegotiations and we confirm that fewer renegotiations occur in times of lower corruption and a higher rule of law.

Our final hypothesis relates learning to the bidding and renegotiations experience. In the initial bidding process for PPP contracts, private parties (consortia) bid in two rounds; the first one yields and ranking and the top two ranked firms bid in a second round. Previous experience in bidding does not lead to a higher final rank in the first round, but conditional on passing to the second bidding round, experience does matter in terms of ending up as the final winner of the bidding process. When a bidder has won concessions in the past, his final rank will be higher, but past wins are no guarantee to continue a winning streak. The latter may be explained by the fact that, if firms have won several concessions, they can afford to make higher offers (as they can bear to lose a bid). Experience with PPP contracts and experience with renegotiations does not decrease the probability that a contract will be renegotiated.

We also examine how much a private party can extract in terms of financial compensation from renegotiations with the government. The bargaining power rate shows that the private party can extract most of the financial compensation it had asked for, and this bargaining rate is more favourable at and around the elections for the private party, especially when it is a Portuguese consortium with political connections. There is little evidence that the public party learns from renegotiations over time as the bargaining power rate remains very high and in favour of the private sector. All of the above shows that private firms in PPP contracts frequently use renegotiations and benefit from them. They time renegotiations well, and take advantage of the political climate, electoral cycles, political connections, and the institutional environment, and can eliminate initial competition in the bidding process banking on setting unfavourable situations right by means of a series of subsequent renegotiations. One can therefore wonder whether the public sector is ignorant of the circumstances and consequences

of renegotiations. This is (or ought) not to be the case considering the stream of reports from the Court of Audits, the public sector's monitor, over the past two decades. These reports have provided clear insights in the strengths, but especially in the disadvantages and pitfalls of the use of PPPs.

The identification of the weak points in the PPP process has led to new PPP regulation, such as the 2006 PPP law. While this law may have imposed some discipline on the public sector, the number of renegotiations (initiated both by the public and the private sector) has not decreased over time. Furthermore, no real learning was uncovered in the contract design (in relation to renegotiations): the relevant clauses in the initial contracts did not materially change over the past 20 years across contracts nor did renegotiation clauses within individual over time (subsequent to renegotiations). The government's inactivity may reflect the lack of legal/technical ability and foresight on the part of the executive public entities. We have observed that the government is not a good negotiator in that in the vast majority of cases, it fully meets the compensation demands by the private partner. We also noted that political connections – board members of construction firms are former politicians or even ministers – enhance renegotiations, which calls for a ban on such conflicts of interests by former politicians (and by extension, people with experience in the relevant ministries).

References

Anand, B., & Khanna, T. 2000. Do firms learn to create value? The case of alliances. *Strategic management journal*, 21(3), 295-315.

Argyres, N. & Liebeskind, J. 1999. Contractual commitments, bargaining power, and governance inseparability: incorporating history into transaction costs theory, *Academy of Management Review*, 24(1), 49-63.

Argyres, N., Bercovitz, J. & Mayer, K. 2007. Complementarity and evolution of contractual provisions: An empirical study of IT services contracts. *Organization Science*, 18(1), 3-19.

Argyres, N. & Zenger, T. 2012. Capabilities, transaction costs, and firm boundaries. *Organization Science*, 23(6), 1643-1657.

Ariño, A., & De La Torre, J. 1998. Learning from failure: Towards an evolutionary model of collaborative ventures. *Organization science*, 9(3), 306-325.

Ariño, A., Reuer, J., Mayer, K. & Jané, J. 2014. Contracts, negotiation, and learning: An examination of termination provisions. *Journal of Management Studies*, 51(3), 379-405.

Bercovitz, J. & Tyler, B. 2014. Who I Am and How I Contract: The Effect of Contractors' Roles on the Evolution of Contract Structure in University–Industry Research Agreements. *Organization Science*, 25(6), 1840-1859.

Boyer, E. J., Van Slyke, D. M., & Rogers, J. D. (2015). An empirical examination of public involvement in Public-Private Partnerships: Qualifying the benefits of public involvement in PPPs. Journal of Public Administration Research and Theory, Volume 26 Issue (1), 45-61.

Carson, S., Madhok, A., & Wu, T. 2006. Uncertainty, opportunism, and governance: The effects of volatility and ambiguity on formal and relational contracting. *Academy of Management Journal*, 49(5), 1058-1077.

Crocker, K. & Reynolds, K. 1993. The efficiency of incomplete contracts: An empirical analysis of Air Force engine procurement. *RAND Journal of Economics*, 24, 126–146.

Cruz, C. & Marques, R. 2013. Exogenous Determinants for Renegotiating Public Infrastructure Concessions: Evidence from Portugal. *Journal of Construction Engineering and Manage*ment, 139(9), 1082–1090.

Curhan, J., Elfenbein, H., & Xu, H. 2006. What do people value when they negotiate? Mapping the domain of subjective value in negotiation. *Journal of personality and social psychology*, 91(3), 493.

Das, T., & Teng, B. 1996. Risk Types and Inter-Firm Alliance Structures. *Journal of Management Studies*, 33(6), 827-843.

Das, T., & Teng, B. 1998. Between trust and control: Developing confidence in partner cooperation in alliances. *Academy of management review*, 23(3), 491-512.

De Brux, J. 2010. The dark and bright sides of renegotiation: an application to transport concession contracts. *Utilities Policy*, 18 (2), 77–85.

Domingues, S., & Sarmento, J. 2016. Critical renegotiation triggers of European transport concessions. *Transport Policy*, 48, 82-91.

Domingues, S. & Zlatkovic, D. 2014. Renegotiating PPP Contracts: Reinforcing the 'P' in Partnership. *Transport Reviews*, 35(2), 204-225.

Doz, Y. 1996. The evolution of cooperation in strategic alliances: Initial conditions or learning processes?. *Strategic management journal*, 17(S1), 55-83.

Dyer, J. & Singh, H. 1998. The relational view: Cooperative strategy sources of interorganizational competitive advantage. *Academy of Management Review*, 23, 660–679.

Engel, E., Fischer, R. & Galetovic, A. 2009. Soft budgets and renegotiations in public-private partnerships. National Bureau of Economic Research,Working Paper nº 15300.

Estache, A., Guasch, J. & Trujillo, L. 2003. Price caps, efficiency payoffs and infrastructure contract renegotiation in Latin America. World Bank Policy Research Working Paper nº 3129.

Fisman, R. 2001. Estimating the value of political connections. *American Economic Review*, 91, (4), 1095-1102.

Flyvbjerg, B., Holm, M. & Buhl, S. 2002. Underestimating costs in public works projects: Error or lie?. *Journal of the American planning association*, 68(3), 279-295.

Ghoshal, S. & Moran, P. 1996. Bad for practice: A critique of transaction cost theory. *Academy of Management Review*, 21, (1), 13-47.

Grossman, S. & Hart, O. 1986. The cost and benefits of ownership: A theory of vertical and lateral intégration. *Journal of Political Economy*, 94(4):691–719.

Guasch, J. 2004. Granting and renegotiating infrastructure concessions: doing it right. World Bank Publications.

Guasch, J., Laffont, J. & Straub, S. 2003. Renegotiation of concession contracts in Latin America (Vol. 3011). World Bank Publications.

Guasch, J., Laffont, J. & Straub, S. 2007. Concessions of infrastructure in Latin America: Government-led renegotiation. *Journal of Applied Econometrics*, 22(7), 1267–1294.

Guasch, J., Laffont, J. & Straub, S. 2008. Renegotiation of concession contracts in Latin America: Evidence from the water and transport sectors. *International Journal of Industrial Organization*, 26(2), 421–442.

Guasch, J. & Straub, S. 2006. Renegotiation of infrastructure concessions: an overview. Annals of Public and Cooperative Economics, 77(4), 479–493.

Guasch, J. & Straub, S. 2009. Corruption and concession renegotiations: Evidence from the water and transport sectors in Latin America. *Utilities Policy*, 17(2), 185–190.

Harrison, D. 2004. Is a Long-term Business Relationship an Implied Contract? Two Views of Relationship Disengagement. *Journal of Management Studies*, 41(1), 107-125.

Hart, O. 1990. Property Rights and the Theory of the Firm. *Journal of Political Economy*, 98, 1119–1158

Hart, O. 2003. Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships. *The Economic Journal*, 113(486), C69–C76.

Hoffmann, V., Trautmann, T., & Hamprecht, J. 2009. Regulatory uncertainty: A reason to postpone investments? Not necessarily. *Journal of Management Studies*, 46(7), 1227-1253.

Hong, H. & Kostovetsky, L. 2012. Red and blue investing: Values and finance. *Journal of Financial Economics*, 103(1), 1-19.

Kern, T., Willcocks, L. & van Heck, E. 2002. The winner's curse in IT outsourcing: Strategies for avoiding relational trauma. *California Management Review*. 44(2), 47–63.

Kim, J. B., Song, B. Y., & Wang, Z. (2017). Special purpose entities and bank loan contracting. *Journal of Banking & Finance*, 74, 133-152.

Kwon, I. (2014). Motivation, discretion, and corruption. *Journal of Public Administration Research and Theory*, 24(3), 765-794.

Kumar, R., & Nti, K. 1998. Differential learning and interaction in alliance dynamics: A process and outcome discrepancy model. *Organization science*, 9(3), 356-367.

Lazzarini, S., Miller, G. & Zenger, T. 2008. Dealing with the paradox of embeddedness: The role of contracts and trust in facilitating movement out of committed relationships. *Organization Science*, 19(5), 709-728.

Lumineau, F. & Oxley, J. 2012. Let's work it out (or we'll see you in court): litigation and private dispute resolution in vertical exchange relationships. *Organization Science*, 23(3), 820-834.

Macaulay, S. 1963. Non-contractual relations in business. *American Sociological Review*, 28: 55–70.

Malhotra, D & Murnighan, J. 2002. The effects of contracts on interpersonal trust. *Administrative Science Quarterly*, 47: 534–560.

Mayer, K. & Argyres, N. 2004. Learning to contract: Evidence from the personal computer industry. *Organization Science*, 15: 394–410.

Miranda Sarmento, J, & Renneboog, L. 2016. Anatomy of Public-Private Partnerships: Their Creation, Financing, and Renegotiations. *International Journal of Managing Projects in Business*, vol. 9 n°1.

Moore, A., Straub, S., & Dethier, J. 2014. Regulation, renegotiation and capital structure: theory and evidence from Latin American transport concessions. *Journal of Regulatory Economics*, 45(2), 209-232.

Rainey, H. G., & Bozeman, B. (2000). Comparing public and private organizations: Empirical research and the power of the a priori. *Journal of Public Administration Research and Theory*,10(2),447-470.

Saussier, S. 2000. Transaction costs and contractual incompleteness: the case of Électricité de France. *Journal of Economic Behavior & Organization*, 42(2), 189-206.

Spiller, P. 2008. An institutional theory of public contracts: Regulatory implications: National Bureau of Economic Research, Working paper n° w14152.

Tirole, J., 1986. Procurement and renegotiation. *Journal of Political Economy*, 94 (2), 235–259.

Tirole, J. 1999. Incomplete Contracts: Where do We Stand? *Econometrica*, 67(4), 741–781.

Weber, L., & Mayer, K. 2011. Designing effective contracts: Exploring the influence of framing and expectations. *Academy of Management Review*, 36(1), 53-75.

Williamson, O. 1979. The transaction-cost economics: the governance of contractual relations. *Journal of Law and Economics*, 22 (2), 233–261.

Williamson, O. (1989). Transaction cost economics / Chapter 3. In S. Richard & W. Robert (Eds.), Handbook of Industrial Organization (Vol. 1, pp. 135–182): Elsevier.

Williamson, O. (1996). Economic organization: The case for candor. *Academy of Management Review*. 21: 48 –57.

Table 1 – Theoretical framework for PPP renegotiations

THEORY	ISSUE	IMPACT	Result
1. **Contract theory**	Incomplete PPP contracts due to contract duration and complexity, and investment levels	Uncertainty induces renegotiations	**More Renegotiations**
2. **Political Economics**	Governments seeking to win elections, and firms with political connections seeking additional rents	Opportunistic and strategic behaviour leads to (unnecessary) renegotiations	
3. **Institutional theory**	Corruption and quality of legal system and rule of law	Low regulatory and institutional quality increases threat of litigation, which induces more negotiations	
4. **Learning theory**	Organizational learning is induced by PPP experience	Government's and private firms' lack of experience with PPP process increases number of renegotiations	

Table 2 – Hypotheses on the probability of renegotiations

Hypotheses	Explanatory variable	Related control variables	Expected sign and justification
H1: Contracts with long duration, high levels of complexity, and high investment embed more uncertainty, which increases the probability of renegotiations.	▪ Investment (Log of Capex) ▪ Contract duration (Number of years of contract) ▪ Debt/Capex ▪ EIB (Dummy: 1 if project is financed by EIB, and 0 otherwise)	▪ Operational stage (Dummy: 0- if renegotiation occurs during construction stage; 1- if renegotiation occurs during operational stage) ▪ Availability payment (Dummy: 0 – if revenues are based on users' payments, 1 – if payment is made by government, based on availability of infrastructure, regardless of demand)	▪ Main effect: A higher investment increases private sector risk and thus also the probability of renegotiation. ▪ Main effect: The length of contracts increases uncertainty, which augments the probability of renegotiation ▪ Main effect: Higher leverage increase the risk of financial distress, which increases the probability of renegotiation ▪ Main effect: Long-term debt financing from the EIB (European Investment Bank) increases the PPP's financial stability because the need to contract commercial bank debt is lower, the EIB's loans extend over the whole PPP duration at below market rates, and the involvement of the EIB enhances the trust of financial markets which leads to lower interest rates on commercial debt. Thus, EIB funding is expected to reduce the likelihood of renegotiation. ▪ Control: PPPs with availability payment have lower risk (they do not assume demand risk), which reduces the probability of renegotiations. ▪ Control: A higher probability of renegotiations occurs in the operational stage, due to higher uncertainty.

Hypotheses	Explanatory variable	Control variables	Expected sign and justification
H2: Opportunistic behavior due to electoral cycles and political connections increases renegotiations	▪ Election years at t, t-1, and t+1 ▪ Foreign shareholders Dummy (0 – if national shareholders; 1 – if foreign)	▪ Change in government ▪ Right-wing government ▪ Ascendi Dummy (0 – if the PPP does not belong to Ascendi group; 1 – otherwise) ▪ Majority government (0 if renegotiation occurs during government without a majority in parliament; 1- otherwise)	▪ Main effect: Electoral years increase probability of renegotiations, due to possible opportunistic behavior by governing parties. The year before an election increases the likelihood of renegotiation, due to governments fearing being voted out of office; The year after an election positively affect renegotiations because newly elected officials may be more willing to negotiate. ▪ Main effect: Equity stakes held by foreign shareholders reduce renegotiations, as these shareholders are less politically connected, and are less likely to be able to influence government decisions in renegotiations. ▪ Control: A change in government may lead to opportunistic behavior from private sector, leading to more renegotiations. ▪ Control: Right-wing governments positively affect renegotiations, as they usually have stronger ties with the private sector. ▪ Control: The presence of the powerful Ascendi group positively correlates with renegotiations, as it is the largest PPP group owned by two politically connected shareholders (Mota-Engil and BES) ▪ Control: Majority governments should favor renegotiations, as they are more powerful in decision making
H3: A better legal and institutional environment reduces the occurrence of renegotiations.	▪ 2006 PPP Law (Dummy, 0 if the renegotiation is prior to the 2006 PPP Law; 1- otherwise) ▪ Low Corruption (scale 1-10, 10 is lowest corruption level) ▪ Rule of Law (scale 1-10, 10 is strongest rule of law)	▪ Low Political risk rating (scale 1-100, 100 is lowest risk) ▪ Contract viability (scale 1-10; 10 is best viability) ▪ Public Debt as a % of GDP ▪ Fiscal Deficit as % of GDP	▪ Main effect: In periods with a better legal environment (stricter legislation, lower corruption), the probability of renegotiations is lower. ▪ A more effective judicial system increases the likelihood of private sector to ask for renegotiations and shortens the likelihood, as a stalemate in renegotiations will be resolved in court. ▪ Control: Less fiscal space increases the odds of (government induced) renegotiations, as government may seek to postpone expenditures.

Hypotheses	Explanatory variable	Control variables	Expected sign and justification
H4: The experience of previous renegotiations reduces the probability of renegotiations.	▪ First renegotiation (Dummy: 0- no; 1 – yes) ▪ Number of renegotiations ▪ Years since previous renegotiation	▪ Concession age	▪ Main effect: Among the multiple renegotiations of the PPPs, first renegotiations are expected to have a higher probability of occurrence relative to subsequent ones as the likelihood of yet another serious problem that urges for a second or third renegotiation is smaller. Furthermore, an effective first renegotiation reduces the probability of subsequent renegotiations. ▪ Controls: the more time has evolved since a renegotiation, the higher the probability of a renegotiation.

Table 3 – Explanatory Variables

This table presents the definition of the main explanatory variables, their source, and units of each variable. I = indicator variable; Disc. = discrete variable. Source: given below

Variable	Type/Unit	Source	Description
Investment	Log of Capex	Ministry of Finance PPP report	The log of project investment value.
Contract duration	Disc.	idem	Total number of years of PPP contract
Debt/Capex	Discr. (%)	idem	Debt as % of total PPP investment
EIB	I	idem	1 if project is partially funded by European Investment Bank; 0 - otherwise
Operational stage	I	Own variable	1 if renegotiation occurred at operational stage, 0 otherwise (in construction phase)
Availability Payment	I	Ministry of Finance PPP report	1 if project is paid for availability and 0 if it is paid by demand
Election years (at t)	I	Portuguese gov. site	1 if renegotiation occurred in election year, 0 otherwise
Election year lag (at t-1)	I	Idem	1 if renegotiation occurred in year previous to election year, 0 otherwise
Election year lead (at t+1)	I	idem	1 if renegotiation occurred in year after election year, 0 otherwise
Foreign shareholders	I	Ministry of Finance PPP report	1 if PPP company is mainly owned by foreign companies, 0 if owned by national companies
Change in government	I	Portuguese gov. site	1 if renegotiation occurred in election year with a change in government, 0 otherwise
Right-wing government	I	idem	1 if renegotiation occurred in year with a right-wing government in power, 0 otherwise
Ascendi	I	Ministry of Finance PPP report	1 if PPP belongs to Portuguese group "Ascendi", 0 otherwise
Majority government	I	Portuguese gov. site	1 if renegotiation occurred in year with majority government in power, 0 otherwise
2006 PPP law	I	Own variable	1 if renegotiation occurred since the 2006 PPP law, 0 otherwise
Low Corruption	Discr.	PSR group	Rating from 1 to 10, 10 is lowest corruption.
Rule of Law	Discr.	Idem	Rating from 1 to 10, 10 is best rule of law.
Low Political risk rating	Discr.	idem	Rating from 1 to 100, 100 is lowest risk.
Contract viability	Discr.	idem	Rating from 1 to 10, 10 is highest contract viability.
Public debt	Discr.	Eurostat	Public debt as % of GDP
Fiscal deficit	Discr.	idem	Public deficit as % of GDP
First renegotiation	I	Own variable	1 if renegotiation is first renegotiation; 0 otherwise.
Number of renegotiations	Discr.	Idem	Number of previous renegotiations
Years since previous renegotiation	Discr.	idem	Number of years since previous renegotiation was started.
Concession age	Discr.	Own variable	Number of years since signing of PPP contract until renegotiation
First bidding	I	idem	1 if company is bidding for the first time, 0 – otherwise

Table 3 continued

Variable	Type/Unit	Source	Description
Previous experience	Discr.	idem	Number of times company has bid before
Previous winner	Discr.	idem	Number of times company has won a bid
Consortium size	Discr.	Ministry of Finance PPP report	Number of companies in consortium

Table 4 – Descriptive statistics

This table presents the descriptive statistics of the explanatory variables. Source: see Table 3.

Variable	Obs.	Mean	St. Dev.	Min.	Max
Renegotiated	428	0.59	0.49	0	1
Road sector	428	0.80	0.40	0	1
Railway sector	428	0.08	0.28	0	1
Security sector	428	0.02	0.13	0	1
Investment (log of M€)	428	6.06	1.35	1.1	7.93
Contract duration (years)	428	28.41	6.21	4	36
Debt/Capex (%)	428	69%	21%	14%	97%
EIB	428	0.68	0.47	0	1
Operational stage	428	0.69	0.46	0	1
Availability payment	428	0.39	0.49	0	1
Election years (at t)	428	0.42	0.49	0	1
Election year lag (at t-1)	428	0.32	0.47	0	1
Election year lead (at t+1)	428	0.35	0.48	0	1
Foreign shareholders	428	0.23	0.42	0	1
Change in government	428	0.33	0.47	0	1
Right-wing government	428	0.47	0.50	0	1
Ascendi	428	0.30	0.46	0	1
Majority government	428	0.77	0.42	0	1
2006 PPP law	428	0.77	0.42	0	1
Low Corruption	428	6.17	0.23	5.56	6.97
Rule of Law	428	2.31	0.27	1.5	2.5
Low Political risk rating	428	79.16	5.62	71	91
Contract viability	428	3.07	0.95	2	4
Fiscal deficit (%)	428	-6.8%	2.5%	-2.7%	-9.6%
Public debt (%)	428	82.2%	22.7%	48.7%	120%
First renegotiation	428	0.06	0.24	0	1
Number of renegotiations	428	1.70	2.16	0	9
Years since previous renegotiation	428	1.13	1.57	0	11
Concession age (years)	428	6.15	3.94	1	18

Table 5 - PPP renegotiations

Panel A shows data collected on renegotiations. Panel B exhibits % of PPPs that renegotiate under specific conditions. Source: See Table 3.

PANEL A					
Data	Roads	Railway	Health	Security	Total
Number of PPPs	22	2	10	1	35
Capex (M€)	18.801	502	650	126	20.079
Renegotiations events	233	17	1	3	254
Number of companies renegotiated	22	1	1	1	25
Renegotiations asked during construction stage	78	3	0	2	83
Renegotiations asked during operational stage	155	14	1	1	171
Renegotiations with traffic/demand payment	103	17	1	0	121
Renegotiations with availability payment	130	0	0	3	133
Renegotiations asked in election years	112	4	1	0	117
Renegotiations accepted	70	12	0	0	82
Renegotiations rejected	5	0	0	0	5
Renegotiations ongoing (at end 2012)	158	5	1	3	167
PANEL B					
Years between contract and first renegotiation	3.4	7.0	4.0	2.0	3.5
% PPP renegotiated	100%	50%	10%	100%	71%
% PPP renegotiated in first 3 years	64%	0%	0%	100%	43%
% PPP renegotiated in first 4 years	82%	0%	10%	100%	57%
% PPP renegotiated in construction period	82%	50%	0%	100%	57%
% PPP renegotiated in operational period	77%	50%	10%	100%	57%
% PPP renegotiated in electoral year	44%	2%	0%	0%	46%
% PPP renegotiated by left government	42%	4%	0%	1%	47%
% PPP renegotiated with national shareholders	64%	6%	0%	1%	72%

Table 6 - Renegotiation motives and timing

Panel A presents the main motives behind the renegotiation events. Panel B gives the average time between award of the concession and first renegotiation event; and time between the beginning of the operations and first renegotiation event. Source: See Table 3.

PANEL A					
PPP events	Roads	Railway	Health	Security	Total
Public sector motives					
Specific legal changes	79	0	0	0	79
Corporate tax increase relative to case base	11	0	0	0	11
Administrative delays	5	0	0	3	8
Contract changes	6	0	0	0	6
Changes in environmental requirements	1	0	0	0	1
Sub-total	102	0	0	3	105
Construction motives					
Archaeological findings	35	0	0	0	35
Additional unforeseen investment	23	3	0	0	26
Delay in expropriations	8	0	0	3	8
Construction overruns	7	0	0	0	7
Sub-total	73	3	0	0	76
Operational and major causes motives					
Low demand	0	14	0	0	14
Global agreement	11	0	0	0	11
Major causes events	4	0	1	0	5
Additional financial compensations	1	0	0	0	1
Other events	42	0	0	0	42
Sub-total	58	14	1	0	73
TOTAL	233	17	1	3	254
PANEL B					
Time in years					
Time between contract and (any) renegotiation	Mean	Median	Min.	Max.	St. Dev
Roads	7	7	1	18	4
Railway	9	9	7	11	1
Health	4	4	4	4	0
Security	3	3	2	5	2
Total	7	7	1	18	4
Time between 1st year of operation and renegotiation	Mean	Median	Min.	Max.	St. Dev
Roads	6	5	1	15	3
Railway	6	6	6	8	1
Health	3	3	3	3	0
Security	1	1	1	1	0
Total	6	5	1	15	3

Table 7 – The probability of PPPs renegotiations

This table shows the marginal effects of random effects probit models with as dependent variable the renegotiation/no-renegotiation event (1 in case of a renegotiation). We use alternative variables in some models as we cannot include all variables in the same model due to multicollinearity. Robust standard errors are in parentheses. Clustering of standard errors is at the contract level.

The industry (sector) fixed effects in Table 6 affect the significance of the investment level, debt and availability payment. This implies that the differences in these variables are high across sector and that the industry effects dominate the cross-sectional variation, independent of sector. Still, the cross-sectional impact of investment, debt, and availability payment is still important within industries; when we re-estimate the models of Table 7 for the road sector, we find that the results of models 2, 4 and 6 are upheld.

*** stands for $p<0.01$, ** stands for $p<0.05$, and * for $p<0.1$. Source: see Table 3.

VARIABLES	(1) Renegotiated	(2) Renegotiated	(3) Renegotiated	(4) Renegotiated	(5) Renegotiated	(6) Renegotiated
Road sector	0.85***		0.91***		0.85***	
	(0.04)		(0.04)		(0.05)	
Railway sector	0.48***		0.52***		0.48***	
	(0.06)		(0.07)		(0.06)	
Security sector	0.41***		0.42***		0.41***	
	(0.04)		(0.05)		(0.04)	
Hypothesis 1: Uncertainty and contract incompleteness						
Investment	-0.01	0.20***			-0.01	0.20***
	(0.01)	(0.04)			(0.06)	(0.04)
Contract duration			-0.02*	0.02***		
			(0.01)	(0.01)		
Operational stage	0.32***	0.24***	0.32***	0.25***	0.32***	0.24***
	(0.09)	(0.09)	(0.09)	(0.08)	(0.09)	(0.09)
Debt/Capex	-0.01***	-0.01	-0.01***	-0.00*	-0.01***	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
EIB		0.05		0.17*		0.05
		(0.10)		(0.09)		(0.10)
Availability payment	-0.18	-0.12*	-0.17	-0.13*	-0.18	-0.12*
	(0.121)	(0.10)	(0.12)	(0.10)	(0.12)	(0.10)
Hypothesis 2: Political economics and opportunistic behavior						
Electoral year	0.24	0.25	0.45**	0.34***		0.25
	(0.21)	(0.20)	(0.19)	(0.18)		(0.20)

Table 7 continued

VARIABLES	(1) Renegotiated	(2) Renegotiated	(3) Renegotiated	(4) Renegotiated	(5) Renegotiated	(6) Renegotiated
Electoral year (t-1)	0.27*	0.28**	0.37***	0.34***	0.16	0.28**
	(0.14)	(0.13)	(0.10)	(0.09)	(0.12)	(0.13)
Electoral year (t+1)	0.01	0.11	0.17	0.14	-0.01	0.11
	(0.14)	(0.13)	(0.15)	(0.14)	(0.10)	(0.13)
Right-wing government	0.25	0.24	0.31*	0.27*	0.26	0.24
	(0.26)	(0.25)	(0.17)	(0.16)	(0.28)	(0.25)
Change in government					0.05	
					(0.23)	
Foreign shareholders	0.01	0.25**	0.03	0.18***	0.04	0.25**
	(0.10)	(0.06)	(0.09)	(0.07)	(0.10)	(0.06)
Ascendi	0.11	0.21**	0.11	0.12*	0.11	0.21**
	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)
Majority government	-0.29	-0.27	-0.42***	-0.41***	-0.26	-0.27
	(0.20)	(0.19)	(0.10)	(0.08)	(0.27)	(0.19)
Hypothesis 3: Legal and Institutional environment						
2006 PPP Law	0.55**	0.57**	0.61***	0.58***	0.51**	0.57**
	(0.17)	(0.17)	(0.12)	(0.14)	(0.20)	(0.17)
Low Corruption	-0.42	0.41			-0.53*	-0.41
	(0.35)	(0.34)			(0.36)	(0.34)
Low Political risk			-0.04	-0.03		
			(0.04)	(0.03)		
Rule of Law	0.43*	0.42*	0.53***	0.47***	0.48**	0.42**
	(0.24)	(0.23)	(0.192)	(0.18)	(0.24)	(0.23)
Contract viability	-0.27	-0.17			-0.26	-0.17
	(0.31)	(0.30)			(0.40)	(0.29)
Fiscal Deficit	0.04	0.04	0.05	0.05	0.01	0.01
	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)	(0.03)
Public debt	-0.01	-0.01	-0.01	0.01	-0.01	-0.01
	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)

Table 7 continued

VARIABLES	(1) Renegotiated	(2) Renegotiated	(3) Renegotiated	(4) Renegotiated	(5) Renegotiated	(6) Renegotiated
Hypothesis 4: Renegotiation experience and learning						
First renegotiation	0.46***	0.44***	0.48***	0.43***	0.46***	0.44***
	(0.04)	(0.03)	(0.04)	(0.03)	(0.04)	(0.03)
Number of renegotiations	-0.37**	-0.46***	-0.26	-0.45***	-0.39**	-0.46***
	(0.18)	(0.17)	(0.20)	(0.16)	(0.18)	(0.17)
Years since previous renegotiation	0.01	0.01	-0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Concession age	-0.02	-0.01**	-0.02	-0.01	-0.02	-0.01**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	4.41	2.42	3.98	-1.77	6.94	2.42
	(10.63)	(10.65)	(9.95)	(9.71)	(11.70)	(10.65)
Wald test	0.000	0.000	0.000	0.000	0.000	0.000
Observations	428	428	428	428	428	428

Table 8 – Probability of government-led renegotiations

This table shows the marginal effects of random effects probit models with the dependent variable equal to 1 if the government initiates the renegotiation and zero if the private partner does so. There is multicollinearity between right-wing government and election year t-1; between contract viability, low political risk and public debt; and between low political risk and public debt, which is why we test 7 specifications. *** stands for p<0.01, ** stands for p<0.05, and * for p<0.1.

.VARIABLES	(1) Gov Led Renegot.	(2) Gov Led Renegot.	(3) Gov Led Renegot.	(4) Gov Led Renegot.	(5) Gov Led Renegot.	(6) Gov Led Renegot.	(7) Gov Led Renegot.
Hypothesis 1: Uncertainty and contract incompleteness							
Investment	-0.03	0.03	-0.01	-0.03	-0.01	-0.01	-0.01
	(0.10)	(0.10)	(0.10)	(0.10)	(0.06)	(0.04)	(0.10)
Contract duration	0.07**	0.07**	0.01**	0.08**	0.07**	0.05**	0.08**
	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.02)	(0.03)
Operational stage	0.08	0.08	0.12	0.09	0.09	0.13	0.09
	(0.15)	(0.15)	(0.15)	(0.15)	(0-15)	(0.14)	(0.15)
Debt/Capex	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***	0.02***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
EIB	-0.51***	-0.51***	-0.49***	-0.53***	-0.52***	-0.51***	-0.51***
	(0.09)	(0.09)	(0.10)	(0.10)	(0.09)	(0.09)	(0.09)
Availability payment	-0.47***	-0.47***	-0.54***	-0.48***	-0.49***	-0.58***	-0.48***
	(0.17)	(0.17)	(0.15)	(0.17)	(0.17)	(0.15)	(0.17)
Hypothesis 2: Political economics and opportunistic behavior							
Electoral year	0.14	0.46		0.56	-0.51***		-0.11***
	(0.56)	(0.54)		(0.762)	(0.402)		(0.432)
Electoral year (t-1)	-0.81**	-0.61**		-0.66**	-0.75***		-0.46***
	(0.18)	(0.256)		(0.248)	(0.14)		(0.18)
Electoral year (t+1)	-0.42*	-0.41*	-0.41***	-0.48*	-0.64***	-0.16	-0.64***
	(0.27)	(0.28)	(0.14)	(0.28)	(0.16)	(0.15)	(0.19)
Right-wing government			0.02			0.02	
			(0.33)			(0.38)	
Change in government	-0.59***	-0.58**		-0.91***	-0.89***		-0.88***
	(0.23)	(0.23)		(0.18)	(0.04)		(0.07)
Foreign shareholders	0.38***	0.38**	0.39***	0.41***	0.41***	0.42***	0.41***
	(0.13)	(0.13)	(0.14)	(0.13)	(0.14)	(0.12)	(0.12)

Table 8 continued

VARIABLES	(1) Gov Led	(2) Gov Led	(3) Gov Led	(4) Gov Led	(5) Gov Led	(6) Gov Led	(7) Gov Led
Ascendi	0.52***	0.52***	0.52***	0.53***	0.53***	0.56***	0.53***
	(0.10)	(0.10)	(0.11)	(0.11)	(0.10)	(0.09)	(0.11)
Majority government	-0.89***	-0.89***	-0.68***	-0.93***	-0.75***	-0.51***	-0.76***
	(0.05)	(0.03)	(0.10)	(0.05)	(0.07)	(0.23)	(0.06)
Hypothesis 3: Legal and Institutional environment							
2006 PPP Law	0.43	0.27	-0.37	0.42	-0.17	-0.06	-0.38
	(0.44)	(0.52)	(0.28)	(0.64)	(0.32)	(0.40)	(0.18)
Low Corruption	-3.30***	-2.40***	-1.33***	-2.77***	-2.93***	-0.93**	-1.82***
	(1.06)	(0.92)	(0.50)	(0.88)	(0.71)	(0.39)	(0.54)
Low Political risk		-0.09***	-0.09**				-0.12***
		(0.03)	(0.04)				(0.05)
Rule of Law	1.77**	1.57*	1.03***	3.03***	3.22***	0.96***	3.31***
	(0.71)	(0.64)	(0.35)	(0.91)	(1.17)	(0.32)	(1.09)
Contract viability	-0.41***				-0.57***	-0.17	
	(0.15)				(0.25)	(0.25)	
Fiscal Deficit	0.25***	0.26***	0.11***	0.32			
	(0.08)	(0.08)	(0.04)	(0.14)			
Public debt				0.03***			
				(0.01)			
Hypothesis 4: Renegotiation experience and learning							
First renegotiation	0.31***	0.39***	0.31***	0.41***	0.42***	0.34***	0.41***
	(0.13)	(0.13)	(0.12)	(0.128)	(0.13)	(0.12)	(0.13)
Number of renegotiations	0.21**	0.21***	0.21***	0.21**	0.22***	0.22***	0.22***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Years since previous renegotiation	0.00	0.00	0.02	0.00	0.00	0.02	0.00
	(0.04)	(0.04)	(0.04)	((0.05)	(0.05)	(0.05)	(0.05)
Concession age	0.042**	0.042**	0.041**	0.042**	0.041**	0.037**	0.040**
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.03)	(0.02)
Constant	46.96***	50.94***	30.45***	13.80***	8.77***	9.95***	30.55***
	(15.10)	(13.30)	(11.19)	(26.53)	(12.29)	(15.94)	(10.50)
Observations	245	245	245	245	245	245	245

Table 9 – Experience in bidding

This table relates the bidder's rank (win) to experience in the bidding process. (1) is estimated by means of an ordered probit whereby the bidder's rank (after first round of bidding) is the dependent variable. In (2), the dep. variable captures whether a firm has won or lost in the 2nd stage bid. The models include firm and year fixed effects. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) Bidder Rank (ordered probit)	(2) Win (/Lose) (probit)
Previous experience	-0.29***	0.29***
	(0.06)	(0.08)
Previous winner	0.53***	-1.24***
	(0.11)	(0.31)
Consortium size	0.09	-0.63**
	(0.07)	(0.27)
Constant	0.01	1.07
	(0.51)	(1.31)
Firm effects	Yes	Yes
Year effects	Yes	Yes
Observations	279	89

Table 10 – PPP renegotiations and the bargaining power rate

This table presents the results of a pooled OLS regression with as dependent variable the bargaining power rate. To avoid multicollinearity, we did not include concession age and years since previous renegotiation into one model; idem for electoral year and change in government. Robust standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

VARIABLES	(1) bargaining power rate	(2) bargaining power rate
First renegotiation	-0.00	-6.12
	(10.52)	(13.98)
Concession age	-0.49	
	(1.75)	
years since previous renegotiation		-3.16
		(2.74)
Electoral year	18.26*	
	(9.70)	
Electoral year t-1	16.22	16.38*
	(12.17)	(8.86)
Electoral year t+1	16.44	15.90**
	(10.41)	(7.92)
Right-wing government	-40.39**	-43.20***
	(17.45)	(14.14)
Change in government		22.62
		(16.24)
Foreign shareholders	-34.96***	-35.90**
	(13.00)	(14.54)
Ascendi	22.11**	25.37***
	(10.63)	(8.87)
Majority government	-8.27	-8.05
	(14.04)	(9.56)
2006 PPP Law	5.44	9.83
	(11.05)	(10.87)
Constant	69.04***	71.10***
	(13.34)	(10.82)
Observations	65	65
R-squared	0.66	0.67