Renegotiations and Contract Renewals in PPPs.
An Empirical Analysis.

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Abstract

In this paper we shed some lights on the issue of renegotiations. Using an original data-set of 255 expired public-private contracts in the French car park sector, we assess the impact of renegotiations on the contractual relationship. More precisely, we investigate the link between renegotiations and contract renewals. Indeed, if renegotiations led to surplus decrease, then parties would not be prone to contract again together. Our econometric results reveal that some renegotiation types, their frequency and their scope clearly impact on the probability to see a contract renewed as soon as public authorities have discretionary power on the decision to renew a contract with the same private partner. Hence, our results suggest a positive, negative or neutral impact on the contractual surplus depending on the kind of renegotiation and the kind of contract that is considered.

Keywords: Renegotiation, Public Private Contract, Contract Renewal.

1 Introduction

While it is often invoked that public-private partnerships (PPPs) have the potential to achieve efficiency gains, it is also widely accepted that the public has not yet fully realized the benefits. Among the reasons generally put forward to explain this situation is the fact that PPPs are routinely renegotiated (Engel et al. [2009b]), very shortly after contracts are awarded (Guasch [2004]), with renegotiations that generally seem to favor the private party (Guasch [2004], Engel et al. [2009a]). One problem with renegotiations is that they mitigate the potential advantages of competitive auctions. On the other hand, the states of nature change over the life of the contract in ways that are not always anticipated by contracting parties. Renegotiations of inherently incomplete contracts are thus natural and do not necessary imply any opportunistic behavior. As pointed out by Engel et al. [2009b], considering transport PPPs signed in the United States between 1991 and 2010, six out of twenty projects have undergone a major change in the initial contractual agreement. Even higher renegotiation rates have been observed in France for similar projects (Athias and Nunez [2008]).

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Although it has been the object of much attention in the economic literature, the matter of renegotiations in contractual agreements still has not received any clear-cut answer. There is no consensus among economists on the view to adopt about these contractual amendments: are they socially profitable or damageable? Do parties renegotiate because of a "lack of compliance with agreed-upon terms and departure from expected promises"? (Guasch [2004]). Do renegotiations imply losses associated with efforts to evade the contract terms, like it is suggested by the transaction cost economics view? (Williamson [1985], Masten and Saussier [2000], Bajari and Tadelis [2001]). Do renegotiations reduce the strength of incentives leading to a loss of global surplus (Guasch et al. [2006])? Are renegotiations a sign of discord between parties? Or are they simply the result of a need to adapt contractual agreements to a changing environment, without any loss as it is suggested by the incomplete contract theory (Grossman and Hart [1986])? At the end of the day, the issue of the impact of renegotiations looks like an resolved puzzle.

In this paper we shed some lights on those issues. Using an original data-set of 295 expired public-private contracts in the French car park sector, we investigate the link between renegotiations and contract renewals. Because it is nearly impossible to assess the impact of renegotiations on contractual surplus we instead use contract renewal as a proxy. This permits us to assess indirectly the parties' perception about their previous relationship, and, *in fine*, their feeling of fairness/unfairness and surplus creation at renegotiation stages. Had all renegotiations a significantly negative outcome, parties would not be prone to contract again together.

Our database is made of 358 contracts, among which 255 have expired. The other 107 contracts are contract renewals that are still running. We distinguished two types of PPPs, namely delegated management and public procurement that differ mainly concerning the discretionary power of the public administration to choose a co-contractor. We codified every renegotiation in the 255 expired contracts, and we focus on their impact on the probability to see the contract renewed with the same partner.

Our results can be summed-up as follows: First we find no evidence of a relationship between renegotiations and the probability to be renewed in our public procurement subsample. Second, in our delegated contracts subsample, characterized by public authorities discretionary power, we find that there is a threshold below which renegotiating is positive (whatever the object of the renegotiation). We interpret this as the fact that renegotiating *per se* should not be interpreted as a sign of failure of the relationship. This result is reinforced by the fact that the scope in addition with the frequency of renegotiations also impact on the probability to be renewed. Third, depending on the dimensions that are renegotiated, the impact on the probability to see the contract renewed is different. Indeed, our econometric results reveal that some renegotiations clearly increase the probability to see a contract renewed; others do not. Hence, our results suggest a positive, negative or neutral impact on the contractual surplus depending on the kind of renegotiation that is considered as soon as public authorities have a certain extent of discretionary power to decide to renew a contract with their private partner.

We believe our paper contributes to the literature on contracts and renegotiations for several reasons. Instead of studying the determinants of renegotiations as in previous studies (Guasch et al. [2008]), we focus on their consequences on contract renewal as an indirect measure of the impact of renegotiations on surplus. To our knowledge, this has never been done before and this sheds some lights on the consequences of renegotiations, not only on their sources. Our paper also contributes to the literature on contract renewal, which has been investigated, up to now, mainly

as an incentive for investment strategies (Affuso and Newbery [2002], Gautier and Yvrande Billon [2009]). Here, we use contract renewal as a proxy to assess the parties' perception about their previous relationship. This allows us to underline some evidence about the discretionary power of public authorities and the fact that they take into account information concerning previous experiences for delegated management contract. In a way, we thus complement previous papers mentioning the necessity to select bidders carefully when a transaction is complex (Bajari and Tadelis [2001]; Bajari et al. [2003]).

The paper is organized as follows. Our next section presents the related literature on the issue of renegotiations. Then, section 3 describes the car parking sector and the main contractual arrangements. In section 4, we present our original dataset and our empirical strategy. Results are presented and discussed in section 5. We conclude with some public policy implications and some perspectives for future works.

2   What Are The Impacts of Renegotiations? The Puzzle

2.1   Literature Review on Renegotiations

Contract renegotiation has been the object of much attention in the economic literature, at least at the theoretical level. Few has been done at the empirical level explaining that the matter of renegotiations in contractual agreements still has not received any clear-cut answer. However, for a long time now, some studies pointed out the fact that contracts are often renegotiated (Macaulay [1963]; MacNeil [1978]; Goldberg and Erickson [1987]are good examples). Such empirical observations explain, to a certain extent, the evolution of theoretical developments.

On one side of the spectrum of the theoretical analysis, a large part of the contract theory is based on incentive issues in which initial developments insisted on the necessity of full commitment from contracting parties (Bolton and Dewatripont [2005]). In other words, in order to resolve efficiently adverse selection and moral hazard issues, the principal must be able to commit not to renegotiate and to accept *ex post* inefficiencies (i.e. once asymmetric information is resolved, the incentive compatible contract does not lead to the first best anymore) or to frame contracts that are renegotiation proof (Dewatripont [1989]). However, in line with empirical observations, recent developments have focused on the impacts of limited commitment, due, for example, to imperfect institutions (Guasch et al. [2006, 2007, 2008]).

On the other side, the incomplete contract theory suggests that renegotiations are unavoidable and useful as soon as parties develop investments that were non contractible *ex ante* (Grossman and Hart [1986]; Hart [1995]). Renegotiations are then originally viewed as necessary adaptations to fill contractual blanks, explaining why contracting parties have better renegotiate and complete their contractual agreement once *ex post* contingencies arise.[1]

However, following empirical observations challenging the view according to which renegotiations lead to *ex post* payoffs that are systematically higher than expected *ex ante*, recent developments

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[1]However, although the renegotiation process, which is costless, enables to reach higher *ex post* payoffs, the level of incentives to invest *ex post* (leading to renegotiations, depending on the allocation of decision rights) is not necessarily optimal.

of the incomplete contract theory put forward the behavioral assumption that incomplete contracts provide reference points for entitlements in *ex post* trade (Hart and Moore [2008], Fehr et al. [2010]). In contrast with most of the existing literature, Hart and Moore [2008] do not assume that trade becomes fully contractible *ex post*. They make the assumption that the trading parties always have the possibility to provide perfunctory performance (i.e. shading behavior) instead of consummate performance if they feel they did not get what they thought they were entitled to. Thus, the disappointed party is aggrieved and shades. In these papers, it is shown that flexible contracts are likely to make one party dissatisfied.

In between those two views, relies transaction cost economics that has recognized for long the fact that contracts are inefficient governance structures that have to be adapted to their evolving environment, mainly because of the complexity of the environment and bounded rationality of economic actors. Renegotiations are thus viewed as necessary and risky adaptation process that should accommodate with potential opportunistic behaviors (Crocker and Masten [1991], Crocker and Reynolds [1993], Saussier [2000]).
Nonetheless, this literature provides very few insights concerning the overall effect of renegotiations on contractual surplus. And it is of no help when it turns to the precise question of the effects that should be expected depending on the scope and the kind of renegotiations that occur during the contract. Because contracts are incomplete and economic actors potentially opportunistic, contractual adjustment might reflect the necessity to adapt to new circumstances or the parties' actions to appropriate surplus.

One way to circumvent opportunistic behaviors associated with renegotiations is provided by repeated interactions (Baker et al. [2002]). As underlined by the relational contract theory, reputation concerns enhance cooperative behaviors during the sequence of the relationship. Indeed, the fact that contracting parties interact repeatedly makes possible to enforce informal agreements reducing opportunistic behavior because of the loss of future businesses such behavior would entail (Baker et al. [2002], Gil and Marion [2009]). The relational view thus suggests that renegotiation might not be an issue (i.e. cooperation relies on informal contracts that are supposed to avoid opportunistic behaviors) as soon as parties anticipate they will be renewed if they respect the spirit of the contract. It also suggests that contracting parties renew their relationships as long as they are satisfied with their previous relationship.

To sum up, this literature review does not enable to highlight a one-track approach concerning renegotiations and its effects. The empirical literature on renegotiations in public-private partnerships offers another view of this issue.

2.2 Renegotiations in Public Private Contracts

Because they deal with services of general interest, public private contracts and their renegotiations are especially under the scrutiny of regulation bodies (Spiller [2008]). As we will see, this does not prevent the occurrence of renegotiations. The majority of the few existing empirical literature on renegotiations mainly deals with public-private partnerships, because the access to data is possible, and they point out the too important frequency of renegotiations.

Many case studies of renegotiations in public private agreements are given by Guasch [2004]. Studying more than 1000 concession contracts signed in Latin American countries, he found that

54.7% of transportation contracts and 74.4% of water and sanitation contracts were renegotiated between the mid 1980s and 2000. Renegotiations occur shortly after the award (on average 2.2 years after the award), and often, at first glance, favor the private party. The most common outcomes of renegotiations are delays, tariff increases and reduction in investment obligations. This leads the author to consider renegotiations as having mainly negative impacts, reflecting opportunistic behaviors from private partners and canceling the potential advantages of competitive auctions. Renegotiations are viewed as the consequence of aggressive bids in a context of *ex ante* lack of commitment from the government (Bajari et al. [2003], Guasch [2004]). Because the government is unable to commit not to renegotiate and because firms learn their type only after they propose a bid, if a firm wins a call for tenders and discovers she is inefficient (*i.e.* negative profits), she will be prone to ask for renegotiation (Guasch and Straub [2006], Guasch et al. [2008]).

Alternatively, other researches deal with government-led renegotiations (Guasch et al. [2007]) and renegotiations that enable incumbent governments to circumvent budgetary rules before elections (Engel et al. [2009a]).

Whoever is at the origin of the renegotiation process, the empirical literature on renegotiations has underlined very contrasted outcomes: they might be viewed as a game in which there are losers and winners (Estache [2006]) or as a win-win game (De Brux [2010]) depending on contracting parties' behavior and the reason why renegotiations occur.

However, to the extent of our knowledge, no empirical study collected data in order to assess the impact of renegotiations. The only one we are aware of is Bajari et al. [2006], but they focus on the impact of the anticipated cost of renegotiations on the bids proposed by competitors. The level of the bids differs with the expected difficulty to renegotiate (*i.e.* signing a rigid or a flexible contract) They do not provide empirical evidence of the impact of renegotiation on contractual surplus.

Because it is very difficult to assess the general impact of renegotiations on the contractual surplus, we analyze the impact of renegotiations on the willingness of the parties to pursue their relationship, which, to the best of our knowledge, has never been investigated before. Indeed, for a given contract that is ending, we can reasonably believe that if parties are satisfied, the probability to renew their contract is higher compared to the case where they would feel prejudiced.

To conduct our analysis, we collected data in the French car park sector. The next section describes the sector and our data.

3 The French car park sector

3.1 The main characteristics of the sector

In most European countries, on-street and off-street car parks are public, so that municipalities have the responsibility of their provision. The positive externalities and social benefits (environmental concerns, intermodality, urban development, etc.) derived from a high quality of construction and efficient management of car parks are the reasons why they are in the bosom of public authorities. However, although public authorities keep ownership and have to control and monitor car parks, they can delegate the provision of such infrastructure and services through

public-private partnerships (PPP). Concerning French car parks, public authorities have experienced public-private partnerships for long. Indeed, the first concession of car park was awarded in France in 1962 to the firm GTM. Since, the use of such delegation to a private operator has become widespread. According to the French Ministry of Sustainable development [2009], the market of car parks is dominated by private operators, by 73%. 27% are provided in-house, through public provision.

When public authorities decide use a public-private partnership for the provision of their car parks, they have to select among several national and international companies[2] as well as local firms. Thus, as confirmed during an interview by the head of legal department of a car park company, competition is fierce in this sector. There can be up to ten competitors and, on the contrary, calls for tenders with only one bidder are extremely rare.

Prior to selecting their partner, public authorities also have to choose between delegated management and public procurement. Next sub-sections describe each of these PPP contractual arrangements.

3.1.1 Delegated management

The way delegated management contracts are awarded in France is generally organized as follow: the first phase is a prequalification stage that enables private firms to become candidates. They are prequalified on the basis of their previous experience and on their financial robustness. Second, the public authority has to write the call for tenders that specifies the objectives to be reached by the operator. The selection criteria are also provided in the call for tenders, and they generally consist in the acceptability of the level of prices the bidders intend to charge users, the rent the private operator is willing to pay to the public authority in counterpart for the use of the public ground, the technical quality of the bid (as the call for tenders specifies the goals, the bidders must precise their means to reach the goals), and the general quality of the bid. There is generally a third step, when the second one enables to determine a short-list of two or three bidders. This third step is a direct negotiation between the public authority and each of the remaining bidders. Thus, although the selection procedure of delegated management contracts is rather formal, we can observe that for each step, there is room for discretionary power from the public authority, who is allowed not to consider the financial criteria only. Thus, previous experiences, the quality of the bid as well as the quality of negotiation can be taken into account. For this reason, it is relevant to presume that contract renewals are all the more likely to occur than previous experience between parties went well.

In delegated management contracts, private operators may be in charge of the construction of the infrastructure and management of the service (concession), or only of the management of the service (lease contract). The main features of these delegated management contracts is that the private operator bears the demand risk, so that he is remunerated thanks to users fees. Moreover, these contracts are generally long-term ones, so that private operators can invest on or renovate the infrastructure, and have time to pay it off. Thus, these contracts are susceptible to political, economic, social and technical changes that may occur during the execution of the contract. Such changes may involve adaptations of the service.[3]

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[2]Vinci Park, Q-Park, Epolia, Efia, Interparking, Parking de France, UrbisPark, AutoCité and SAGS are the most frequent bidders in France.

[3]Besides, the French legislation takes this necessity of renegotiations into account, through the "mutability principle", in article 1 of February 10th 2000, concerning electricity and then generalized for all public services.

Changes that occur during the execution of the contract may be exogenous to the contract or may directly result from contract maladaptations. Abundant examples of very different sources of renegotiations are provided in the economic literature (Guasch [2004]). In this paper, we do not focus on the determinants but on the impact of renegotiations on the contractual surplus. Indeed, it is reasonable to think hat renegotiations are not neutral on the surplus and thus on the renewal or not of the contract.

3.1.2 Public procurement contracts

Public procurement contracts are not global contracts so that they do not include both construction and management. In the car park sector, they mainly concern the provision of the service, instead of the construction of the infrastructure. Compared to delegated management, the award procedure is more strict. It only includes one stage, with standard criteria (the price is generally the most important one) and well defined tasks delegated to the private operator.

As they are short-term, less complex and more complete[4], one could expect that renegotiations are less likely to occur, than in delegated management.

Nevertheless, in public procurement contracts, residual control rights stay in the hands of public authorities (Bennett and Iossa [2006]), so that any single change requires the approval of the public authority to be implemented, and thus a renegotiation. So, relatively to delegated management contracts, one could also expect renegotiations to be more systematic.

Finally, whatever the frequency of renegotiations, they should have no impact on the probability of contract renewal, since the public authority has no discretionary power. Indeed, previous experiences should not be taken into account in the decision to renew or not a contract, as illustrated by a recent statement from the French Competition Authority: a public authority in charge of public procurement contracts in the field of social housing was sanctioned for disqualifying a competitor because of a bad past experience.

3.2 Scope of the database

In the French car park sector, there is no regulation authority, so that the data are not centralized and very hard to bring together. In order to access to data, we decided to collect the contracts of the French leader company (42% of the market share among private operators). We collected their 666 contracts signed between 1963 and 2008 with 124 different public authorities. Among these contracts, 255 expired, and 107 are the renewals of the expired ones. We pay particular attention to the expired contracts to explore what are the determinants of their renewal, and among these determinants, we question the role of renegotiations. We also have codified contractual amendments : as a result, there are 522 renegotiations out of the 255 expired contracts. We also note that 116 of the expired contracts have never been renegotiated. To summarize, the car park sector seems a relevant application to study how renegotiations affect the turn of a relationship, since it is a mature and competitive market, characterized by frequent renegotiations and the possibility to observe contract renewals.

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[4]The operator is in charge of few tasks. Moreover, a specification booklet was established by State administration in collaboration with representatives of private operators and of association of local councilors in order to propose a contract framework, that public authorities are free to use.

The following table highlights some stylized facts that provide intuitions concerning the potential link between renegotiations and renewals in each type of contractual agreement.

Table 1: Contractual agreements, renegotiations and renewal

	All Contracts	Delegated Management	Public Procurement
Number of expired contracts	255	96	159
Number of on-going contracts (following a renewal)	107	47	60
Average number of renegotiations per year of expired contracts	0.420	0.373	0.447
Average number of renegotiations per year of expired contracts leading to renewal	0.447	0.402	0.450
Average number of renegotiations per year of expired contracts not leading to renewal	0.381	0.350	0.425

The first column mixes all contracts, whatever the kind of contractual agreement: it seems to indicate that contracts that were the object of more renegotiations are, on average, more likely to be renewed. This does not suit with the conventional view about renegotiations as a sign of failure of public-private partnerships.

Then, the second column provides some stylized facts about delegated management contracts: it confirms the previous intuition, by suggesting that private operators seem to be prone to renegotiate contracts in a positive way, so as to maximize their likelihood of renewal. Indeed, contracts that are renewed with the same operator once the contract has expired are those that were previously the most renegotiated. Finally, the last column is about public procurement contracts and it shows that renegotiations are indeed frequent, but they do not seem to impact the probability to be renewed. Next section investigates in deeper refinement the relationships between renegotiations and contract renewals.

4 Empirical Strategy

First, we present the successive specifications we run. Then we describe the variables we use in the estimations.

4.1 Econometric specifications

In this paper, we do not only look at the occurrence of renegotiations. Instead, we try to consider different features of renegotiations that could influence the contractual surplus and thus the likelihood of contract renewal.

Among those features, the celerity of the first renegotiation is frequently used as a proxy of opportunism in the contractual relationship. According to Guasch [2004], the fastest the first renegotiation, the more opportunistic the operator. Indeed, renegotiating fast is generally interpreted as an evidence for an aggressive bid or a winner's curse effect. Symmetrically, we also pay attention to the proximity of the last renegotiation to the expiration of the contract. Another important feature of renegotiations is about their frequency and their types, that is to say how often they occurred and what are their objects. Finally, we investigate the scope of the renegotiated dimensions. Indeed, we wonder whether renegotiating on one dimension (be it once or several times) has the same impact as renegotiating on several dimensions. Thus, we estimate:

$$RENEWED_{it} = a.X_{it} + b.Y_{it} + e_i$$

where $RENEWED_{it}$ is the binary variable that indicates whether contract i is renewed or not at time t; X_{it} is a vector of variables that groups the different features we want to estimate (i.e. the celerity of the first renegotiation, the close-to-the-end of the last renegotiation, the frequency of renegotiations, the frequency of renegotiations according to their types and the scope); Y_{it} is a vector of control variables that could also influence contract renewal and e_i is the error term (we assume that $e_{it} \rightsquigarrow (0, \Sigma)$). Our main interest is on the coefficient a that captures the impact of the different renegotiation features.

4.2 Variables

All descriptive statistics of the variables presented in this section are provided in Table 5 (in appendix).

4.2.1 Dependent variables

We build our dependent variable $RENEWED_i$ that takes the value 1 if the expired contract was followed by a renewal after a new call for tenders, and 0 otherwise. There are three ways to interpret the fact that a contract is not renewed: the choice of the public authority to select another operator, the choice of the public authority to go back to public provision, or the choice of the private operator not to bid again for the contract. Whatever the case, a common explanation is that parties are not willing to contract again together because of dissatisfaction

concerning their previous contractual relationship.

Obviously, another explanation of non contract renewal can be the existence of a cheaper offer made by a competitor. Nevertheless, the likelihood of cheaper offer can reasonably be considered as identically distributed. As a consequence, all things being equal, this possibility does not modify the relationship between renegotiations and contract renewals we analyze.

4.2.2 Independent variables

Celerity.

In order to take into account the celerity of the first renegotiation, we codified the date of the first amendment of all the renegotiated contracts and we built the following variable:

$$\text{CELERITY}_i = \frac{1}{X}$$

Where

$$X = \frac{[\text{Date of the first renegotiation} - \text{Date of Signature}] + 1}{\text{Duration}}$$

We divide the time laps between the signature and the first renegotiation by the total duration of the contract since renegotiating during the first year is different if the contract lasts two or twenty years. As a result, the lower X, the faster the renegotiation. In order to obtain a relevant variable of renegotiation celerity, we use the inverse of X. In this way, contracts that are never renegotiated are coded 0 and, for all the renegotiated contracts, the higher 1/X, the faster the first renegotiation. As a consequence, if the celerity of the first renegotiation is a sign of opportunism in the contractual relationship as argued by **?** making the parties less prone to contract again together, we should observe a negative coefficient associated with our variable $CELERITY_i$.

Last.

A similar reasoning is used to create our variable $LAST_i$ embodying the proximity of the last renegotiation to the expiration. Hence we codified the date of the last amendment of all the renegotiated contracts and we built the following variable:

$$\text{LAST}_i = \frac{1}{Y}$$

Where

$$Y = \frac{[\text{Date of expiration} - \text{Date of the last renegotiation}] + 1}{\text{Duration}}$$

Contracts never renegotiated are also coded 0 and, for all the renegotiated contracts, the higher 1/Y, the closer to the expiration the last renegotiation is.

Frequency of renegotiations.

We capture the frequency of renegotiations by using the variable AV_RENEG_i. This variable is the number of renegotiations per year in each contract i. Here again, the ratio measure (number

of renegotiations / duration of the contract) appears the most relevant since renegotiating four times a two-year contract is not the same as a twenty-year contract. As a consequence, we obtain a measure of the frequency of renegotiations in each contract. As this impact is not eventually non linear, we take this possibility into account by including a squared term of our variable AV_RENEG_i in our regression.

Type of renegotiations.
Afterwards, we detail more precisely the object of renegotiations. We codified the types of contractual amendments and extract the frequency of renegotiations according to their types.
REN_TARIFF_i is the average number of renegotiations per year in each contract i dealing with a change in tariffs charged to users of the service.
REN_INDEX_i is the average number of renegotiation per year in each contract i about a change in the indexation clause to which several aspects of the contract may be attached. Such indexation clauses are a function of different indexes, such as the price index of workforce in building trade and the price index of different materials (cement, concrete, etc.). It is generally foreseen in the original contracts that renegotiations will take place if prices indexes disappear or if they have no more sense for the contract.
$REN\_INVESTMENT_i$ is the average number of renegotiations per year in each contract i about an additional investment that had not been foreseen in the contract. This additional investment may come from the requirement of the public authority, or from a miss-anticipated spending from the private operator.
$REN\_QUALITY_i$ is the average number of renegotiations per year in each contract i improving the quality of service. This process of improvement might be accompanied with an additional investment ($REN\_INVESTMENT_i$ hereabove), as it is the case for example when a new elevator is implemented to facilitate the access to disabled persons, or when free bike rentals are proposed to users so as to promote green cities. Or it might just consist in the implementation of specific tickets, for regular users. In this latter case, we also codified the renegotiation as REN_TARIFF_i.
$REN\_FINAN\_EQ_i$ is the average number of renegotiations per year in each contract i about changes of the financial equilibrium of the contract. This change might have different sources: an error of anticipation, an *ex post* shock, an additional investment that cannot be compensated thanks to an increase of tariffs for instance. These renegotiations generally lead to a decrease in the rent private operators pay to the public authority in counterpart for the use of the public ground or asset.
$REN\_PERIMETER_i$ is the average number of renegotiations per year in each contract i dealing with additional perimeter the private operator is in charge with. Such changes were not that scarce until 1990's, but in 1999, the French State Council issued a statement to make new calls for tenders compulsory if the contract evolved by more than 40% compared to the initial contract.[5]
Finally, $REN\_DURATION_i$ represents the average number of renegotiations per year in each contract i about an extension of the contract duration.

Scope of renegotiations.
The question of the scope of renegotiation is also relevant. In fact, in addition to the frequency of renegotiations, it is important to focus on the number of contractual dimensions that are concerned by *ex post* modifications. As previously emphasized, it is probably easier for the

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[5]Statement n°362.908, September 16th, 1999.

diverging interests of the parties to meet if several dimensions are renegotiated. That is why we built the variable $SCOPE_i$ which corresponds to the number of renegotiated dimensions of each contract i during its lifetime. Each type of renegotiations here above is a dimension. As a result, the variable $SCOPE_i$ is an ordinal variable equal to 0 when there is no renegotiation and equal to 7 if the contract i is concerned by all the previously cited types of renegotiations.

In addition to the celerity, the frequency, the frequency according to their types and the scope of renegotiations that could influence contract renewals, we also identify other potential determinants. We put them as control variables.

4.2.3 Control variables

Past experiences.
Two variables allow us to account for the impact of past experiences. First, the variable $RENEWED_{i,t-1}$ is a dummy variable taking the value 1 if the expired contract i is already a renewal of a previous one.
Second, the variable $PAST\_EXPERIENCES_i$ stands for the number of other expired contracts the private operator and the municipality had shared in the past.

Future business and reputational concerns.
We also take into account the impact of future business and reputational concerns by including two other variables. The first one, $MULTICONTRACT_i$, is the number of other ongoing car park contracts the co-contractors have together at the date of expiration of each contract i. This variable enables to capture future business in which the parties are already engaged and that are still running for a certain period of time.
The second one, $SAME\_AREA_i$, stands for the number of other contracts the operator has with other public authorities belonging to the same region at the date of expiration of each contract i.[6]

Political dimensions.
As the choice of contract renewal could also be influenced by political issue, we introduce the variable $CHANGE\_OF\_MAYOR_i$ which is a dummy variable accounting for a change of mayor in the last year preceding the contract expiration. With this variable, we depart from previous works which take into account the influence of politics by focusing on the political color of the public authority. If it might be relevant to take into account the political color when we analyze the choice of the governance structure, two reasons make us believe that the change of mayor is a better proxy of political influence in our settings. First, in small municipalities, it is frequent to find apolitical mayors who do not officially belong to a particular party. Second but of primary importance, we think that more than the change of ideology (left-wing *vs* right-wing), the most important element is the change of the interlocutor, as it can represent a breach in the dialog between the operator and the municipality. Furthermore, a change of political color is necessarily a change of mayor while the change of mayor can occur without change of political color.

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[6]For the construction of these two variables, our observations are based on the 666 contracts, *i.e.* also on the ongoing contracts that are not a renewal of a previous one.

Miscellaneous.

We control for the different task the operator can be untrusted with and we include the variable $BUILD$ which is a dummy variable that takes the value 1 if the private operator was in charge of the construction of the car park, and 0 otherwise. The results of estimations could also be driven by unobserved characteristics of municipalities and/or the sector. To control those potential biases, we introduce a trend variable $YEAR_i$ that is the year of expiration of contract i. This variable is used in order to capture potential evolution concerning the entire sector such as a decrease or an increase of the competitive pressure. We also introduce the variable $SIZE_i$ that corresponds to the number of inhabitants of each cities at the date of expiration. As will be discussed later, we also tackle fixed effects by clustering our data.

5 Results and Discussion

5.1 The Impacts of Renegotiations

Table 2 provides the results of our successive probit estimates concerning delegated management contracts. Model 0 is the simplest model we can imagine. It only includes our set of control variables and a dummy variable indicating whether the contract was renegotiated or not ($RENEG\_DUMMY$=1 if the contract was renegotiated and 0 otherwise). Models 1 to 4 take into account the different features of renegotiations separately (with control variables). Finally, Model 5 brings together all our independent variables and model 6 also includes all the variables but differs from model 5 by proposing a finest estimation of the impact of renegotiations' scope. Firt of all, the results of model 0 suggest that the fact to renegotiate or not a contract is not the element that is driving the decision to renew or not a contract. This simple result invalidates the literature describing renegotiations in general as being a negative event in the life of a contract and confirms our objective to investigate in further details the relationship between renegotiations and contract renewals. Our results about the celerity of the first renegotiation seems to confirm what is push forward by Guasch [2004] and Estache [2006]. Indeed, our variable CELERITY is negative and significant, meaning that renegotiating quickly adversely impacts the pursuit of the relationship. This result is consistent with the idea that renegotiating fast can be a matter of aggressive bid or of winner's curse effect in the French car park sector. At the opposite, we find a positive and significant impact of the proximity to the expiration of the last renegotiation on the probability of contract renewal.

Results concerning the impact of the frequency of renegotiations suggest that there exist a real impact of the frequency of renegotiation during the execution of a contract and its probability to be renewed with the same partner. We find that AV_RENEG has a significantly positive impact and $AV\_RENEG_i^2$ has a significantly negative impact on the probability to renew the contract. This non linear effect of the variable AV_RENEG_{it} suggest that there is an optimal frequency of renegotiations. This result does not come as a surprise and reflects the fact that contract are governance mechanisms that should be rigid enough to reflect real commitment from contracting parties and flexible enough to permit adaptation as environment evolves.

Turning now to the renegotiation types and their impact on the probability to renew a contract with the same partner, we found that the dimensions on which contracts are renegotiated are crucial. Several dimensions increase the probability to see a contract renewed. Others decrease this probability. This result suggests that the willingness of the parties to renew the contractual

13

relationship is differently impacted depending on renegotiation types. More precisely, two of our variables appear highly significant. On the one hand, the coefficient associated with the variable $REN\_QUALITY$ is positive and significant across estimates. As those renegotiations enable to improve the quality of the service offered to users, they make public authorities more prone to contract again with the same operator. On the other hand, the coefficient associated with the variable REN_FINAN_EQ is negative and significant across estimates. As previously emphasized, those renegotiations come, most of the time, from an error of anticipation, an *ex post* shock or an additional investment that cannot be compensated thanks to an increase of tariffs. Furthermore, these renegotiations generally lead to a decrease in the rent private operators pay to the public authority in counterpart for the use of the public ground or asset. For this reason, they seem to make public authorities less prone to contract again with the same operator.

We also find a negative impact of renegotiations dealing with additional investment as suggested by the negative and significant coefficient of the variable REN_INVEST_i, suggesting that parties can feel prejudiced when they renegotiate on this aspect. Indeed, as previously emphasized, additional investments can be the consequence of a direct requirement of the public authority (and in this case the compliance of the operator might lead to higher probability of contract renewal, or conduct the operator not to bid for the renewal) or of a miss-anticipated spending by the operator requiring to increase tariffs or to revise the financial provision (and in this case the public authority might be reluctant to contract again with the same operator). Our variable $REN\_TARIFFS$ does not appear stable across estimates and we can doubt about its significance. However, this result deserves some explanations. The first interpretation would be to consider renegotiations on tariffs as the fruit of opportunism. Thus, they might be badly perceived by users and might lead public authority in charge of awarding the contracts to not renew the contract with the same operator. The negative impact they have on model 3 and model 6 can be analyzed this way. Nevertheless, those renegotiations on tariffs can also be the *sine qua none* condition allowing additional investments that increase the quality of the service (cf. correlations in Table 6). As a consequence, the impact of REN_TARIFF_i on the probability to renew a delegated management contract is not stable in our estimates. *In fine*, those results suggest that renegotiation types impact differently on contractual surplus, conditioning the probability of contract renewal.

Models 5 and 6 highlight that the scope of renegotiations also matters in the case of delegated management. Indeed, the positive and significant sign associated with our variable $SCOPE$ indicates that contracts have greater chance to be renewed when renegotiated dimensions are numerous. The explanation is quite intuitive. As public authorities and private operators might have contradictory objectives, a renegotiation on a single dimension (be it once or several times) has great chance to be a "zero sum game"; on the contrary, it might be easier to balance different objectives if parties renegotiate on different contractual dimensions. This effect is investigated in greater details in model 6 where we put a dummy for each possible "scope configuration" (i.e. number of different dimensions renegotiated during the contract lifetime). It appears that the probability of contract renewal is higher when contract are renegotiated on two, three or four dimensions rather than zero. Interestingly, we also find that contracts have lower chance to be renewed when they are renegotiated in only one dimension.

5.2 Other relevant variables

Other relevant factors, not related with renegotiations, might impact on the probability to renew the contract. We introduce them in our estimates with our set of control variables.

The variable $PAST\_EXPERIENCES$ is not significant, meaning that the number of past contracts between co-contractors do not to impact on the contract renewals). However, the variable $RENEWED_{t-1}$ impacts negatively on the likelihood of contract renewal. This result comes as a surprise since it lies in opposition both with the idea that the incumbent benefits from a competitive advantage and with the argument of learning and mutual understandings developed through time. A possible explanation could be that public authorities are not willing to stay for too long with a same operator, in order to benefit from the advantage of competition and to avoid potential routines.

Our variables linked to future business and reputational concerns are more consistent with reasonable expectations. As suggested by the relational contract theory and supported by the significance of the variable $MULTICONTRACT$, a higher number of other ongoing contracts makes the threat of relationship termination more pervasive. The reputation effect can also be effective in a broader area than the only concerned city. This geographic reputation effect, if any, is likely to play in a way that benefits the operator. Indeed, in a perspective to have future contracts with the same authority, but with other authorities as well, the private operator is prone to refine his reputation and to act in a way that satisfies the authority. This makes him more likely to be eligible to contract renewal under delegated management when he has ongoing contracts with neighbors municipalities: our variable $SAME\_AREA$ has a positive and significant impact of the probability of contract renewal.

As previously emphasized, we do not focus on political influence properly but we rather focus on the existence of a potential breach of the dialog between the public authority and the operator. Such a breach is more likely to occur than the mayor of the city changes. Indeed, we find that a change of mayor during the last year of the contract reduces the probability of its renewal. This result could also be interpreted as an illustration of a relational dimension of contractual relationship.

Results concerning our variable $BUILT$ come as a surprise as well. Contrary to one would have expected, the construction of the infrastructure does not seem to provide a competitive advantage to the incumbent.

All those control variables allow us to check the robustness of our results. Nevertheless, other variables concerning specific effects of cities or general evolution of the sector might be missing. As a consequence, the main variables of our models could be correlated with those unobserved characteristics and mistakenly appear to have an explanatory power. We take this bias into account in two different ways. First, to deal with general evolution in the car park sector that might influence the probability to be renewed (such as an increase or a decrease of competitive pressure), we include a trend variable $YEAR$. Second, in order to tackle the issue of municipalities' fixed effects, we include the variable $SIZE$ and we cluster our dataset at the city level. As observed in table 2, the variables $YEAR$ and $SIZE$ are not significant. As for data clustering, the regressions we ran without cities fixed effects lead to same results with a slight loss of significance.[7]

We also check for our results' robustness by running a Principal Factor Analysis on the frequency of renegotiations and their types. The primary purpose is to group objects based on the char-

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[7] Results without fixed effects are not provided in the paper but can be made available by the authors.

acteristics they possess with respect to some predetermined selection criteria. Once the MFA is performed, the resulting groups should exhibit high internal (within-cluster) homogeneity and high external (between-cluster) heterogeneity. In our empirical settings, as contracts are subject to different types and different frequency of renegotiations, we identify groups of contract according to their renegotiations types and frequency. The MFA drives us to identify three classes of contract, classified according to the frequency of renegotiations they are concerned with. The first class contains the no or few renegotiated contracts, the third class brings together the most renegotiated contract and the second class regroups intermediary levels of renegotiations. When we include those classes in our probit estimates, we find that contracts which belong to the second class are more likely to be renewed than less renegotiated contracts and than most renegotiated contracts as well. Here again, such a result suggests that on optimal level of renegotiations frequency is required during the contract execution to generate the willingness of the parties to renew the contract. We do not make appears those additional estimates in Table 2 in order to avoid redundant findings.

5.3 The Role of Discretionary Power

5.3.1 Discretionary Power and Contractual Arrangements

The two previous subsections described how the quality of previous interactions and reputation can be taken into account to decide whether to renew a contract or not in delegated management. Thus, one could expect such an analysis to be duplicated to all PPP contracts, and namely public procurement contracts that have been codified in our database as well. This is what we do in Table 3. Results do not hold anymore. Indeed, as mentioned in Section 2, one of the main differences between delegated management and public procurement is about the discretionary power the public authority has. This discretionary power is mostly expressed at the stage of the award procedure. In delegated management procedures, there is room for negotiation and previous experiences considerations, whereas public procurement procedures are much more rigid. Thus, unsurprisingly, the results that we reach regarding the frequency, the celerity, the type and the scope of renegotiations in delegated management disappear by and large under public procurement. This is consistent with the statement of the French Competition Authority, that sanctioned a public authority for disqualifying a competitor in the name of a bad past experience. This illustrates the fact that public authorities have very few discretionary power. Nonetheless, the decisions taken by public authorities to renew a contract or not do not seem to be totally impervious to relational aspects and previous experiences. Indeed, some aspects play a role in the decision to re-award a contract to the same operator: the variable $CELERITY$ is significant and is negatively correlated with the probability to be renewed; the same effect is found for REN_FINAN_EQ and for the control variable $CHANGE\_OF\_MAYOR$.[8] This seems to indicate that discretionary power is not completely absent from public procurement procedures. The explanations we find to understand why it is those three variables that have an

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[8]Note that in the models associated with public procurement contracts, the variable $REN\_TARIFFS$ disappeared. Indeed, in such contracts, the evolution of prices does not impact the revenue of the operator who is paid by the public authority a predetermined price. Thus, if prices change under public procurement, it is the decision of the public party, who does not have to write it in the contract, as it is a unilateral decision. So, there are no $REN\_TARIFFS$ in our public procurement sub-sample. The variable $BUILT$ disappears as well since there is no construction in the case of public procurement.

explanatory power are the following. $CELERITY$ and REN_FINAN_EQ rely on the same kind of possible explanation: as mentioned previously, public procurement contract are shorter term and more rigid contracts than delegated management. The tasks the private operator is entrusted with are less complex and can generally be well defined, thus the bidders are predominantly selected on the basis of the price they propose. Consequently, proposing a low price can be a strategy from the operator to be awarded the contract, being confident in his capacity to renegotiate *ex post*. It is thus easy for the public authority to detect such an aggressive bidding strategy, which may explain the unwillingness to contract again with the same partner.

As for $CHANGE\_OF\_MAYOR$, it can rather be related to a strategy from the public authority. We remind that this variable is equal to 1 if there was a municipal election in year before the end of the expired contract, leading to a change of mayor. Thus, in order to differentiate himself from the incumbent, and to make his opposition visible, the new mayor may be prone to change the operator, whatever the quality of the new bid. Alternatively, it might be due to the fact that the operator does not bid again for the contract if he feels the wind is turning and the new mayor is willing to take decisions at the opposite from the previous mayor.

5.3.2 Discretionary Power *versus* Corruption

One could raise the debate of the unclear distinction between efficient discretionary power and corruption. Indeed, contract renewal could also be interpreted as a sign of favouritism. This question deserves to be pointed out, since we indeed do not have any performance measure of the contract nor any users' satisfactory index. The public authorities are assumed to be benevolent and this may be one of the limits of our paper. However, in case of corruption, we could expect that public authorities would be indifferent to price increases and that contracts would be renewed each time. Our results negate this: contracts with renegotiations dealing with price evolution have lower probability of renewal, which seems to suit the benevolence assumption. Second, contracts that have already been the object of a renewal once, are less likely to be renewed a second time. Third, the robustness of the fixed effect per public authority indicates that the effects are not captured by some public authorities that would renew all the expired contracts whatever the type, the scope and the frequency of renegotiations. Although the matter of discretionary power deserves to be studied into more details in some future papers, our encouraging preliminary answers provide support for the intuition according to which discretionary power differs from corruption. Future investigations should address the conditions under which they differ.

6   Conclusion and Public Policy Implications

In this paper, we tried to provide some new insights on the issue of renegotiations that have been generally analysed through the lens of opportunism. Using an original data-set of 251 expired contracts in the car park sector, we assess the impact of renegotiation on the pursuit or not of contractual relationships. Indeed, renewing a contract can reasonably be interpreted as the fact that the previous one was satisfying for both partners. In our delegated management sample, we find it is necessary to distinguish the types of renegotiations to evaluate their impact

on renewal. In addition, we find a non-linear effect concerning the frequency of renegotiation on the probability to renew a contract. This effect also seems to be confirmed by the scope of renegotiations. These are very innovative results, since we went over the step of looking only at the occurrence of renegotiations or not, and we paid particular attention to the effects of targeted features of renegotiations on the likelihood of contractual renewal. To the best of our knowledge, the only results that existed up to now came from summary statistics [Guasch 2004], but with no econometric treatment. In some way however, we approve Guasch's work concerning the celerity of renegotiations: the quicker the renegotiation after the signature, the lower the probability to renew the contract. This could be interpreted as a sign of aggressive bidding.

Most of our results do not hold anymore when we investigate public procurements that involve more rigid procedures. This last result, in addition to supporting a traditional but yet under-investigated argument in the economic literature, highlights the importance of the role of the discretionary power of public authorities. We also provide some explanations in order to distinguish discretionary power from corruption. But some future investigation should be launched to access the content of the alternative bids which did not win the call for tenders. This would help to understand the choice of public authorities. Unfortunately, this information was not available for this dataset.

Some future work could also insist on the origin of the renegotiation. In our case, detecting for certain who asked for the renegotiation, between the public authority and the private operator, was impossible to do when reading the contracts and the amendments. Knowing if the same party is always at the origin of the renegotiation would enable to better understand why a party would feel prejudiced during the contract execution.

Ultimately, more than providing empirical results for the theoretically unclosed debate about the opportunity of renegotiation, some public policy implications could be derived from our paper. In particular, at a period where the European Union tries to set up a legal framework for public-private partnerships of its member states, we could recommend not to categorically reject the possibility for public authorities to use their discretionary power. Our paper also conducts to accept renegotiations as necessary adaptation processes that are punished when they lead to unbalanced results between the parties.

Table 2: Estimation results from Probit analyses for Delegated Management contracts

	Model 0 Probit	Model 1 Probit	Model 2 Probit	Model 3 Probit	Model 4 Probit	Model 5 Probit	Model 6 Probit
			Dependant variable : **RENEWED**				
RENEG_DUMMY	0.321						
	(0.281)						
CELERITY		-0.046+				-0.140***	-0.457***
		(0.031)				(0.030)	(0.089)
LAST		0.056***				0.047***	0.142***
		(0.014)				(0.018)	(0.041)
AV_RENEG			2.862***			4.709***	11.346***
			(0.684)			(0.839)	(1.870)
AV_RENEG^2			-1.969***			-3.852***	-11.305***
			(0.545)			(1.058)	(2.490)
Type of Renegotiations							
REN_TARIFS				-3.907*		-2.996	3.002
				(2.082)		(2.886)	(4.215)
REN_INDEXATION				-2.092		-3.434	-5.936
				(5.776)		(5.027)	(6.486)
REN_INVESTMENT				-1.070		-4.436***	-6.533***
				(0.819)		(1.714)	(2.382)
REN_QUALITY				13.015***		13.390***	18.379***
				(4.252)		(3.551)	(6.778)
REN_FINAN_EQ				-17.704***		-27.798***	-50.861***
				(4.342)		(4.109)	(6.351)
REN_PERIMETER				-6.868		-10.326	11.970
				(4.931)		(7.587)	(18.428)
REN_DURATION				0.667*		0.103	4.978***
				(0.372)		(1.348)	(1.633)
Scope of Renegotiations							
SCOPE					0.164*	0.458***	
					(0.086)	(0.170)	
ONE_DIMENSION							-2.563***
							(0.509)
TWO_DIMENSIONS							1.519+
							(0.930)
THREE_DIMENSIONS							3.220***
							(0.989)
FOUR_DIMENSIONS							4.446***
							(1.492)
FIVE_DIMENSIONS							-0.735
							(2.329)
Control Variables							
RENEWED$_{t-1}$	-1.101***	-0.877***	-1.588***	-1.560***	-1.203***	-2.318***	-4.431***
	(0.247)	(0.242)	(0.252)	(0.388)	(0.196)	(0.575)	(0.962)
PAST_EXPERIENCES	-0.081	-0.128	-0.063	0.012	-0.057	0.043	-0.161
	(0.084)	(0.093)	(0.078)	(0.097)	(0.078)	(0.100)	(0.121)
MULTICONTRACT	0.727**	0.842**	0.524*	0.745***	0.735**	0.527+	1.463**
	(0.318)	(0.415)	(0.305)	(0.232)	(0.310)	(0.347)	(0.570)
SAME_AREA	0.085***	0.093***	0.083***	0.130***	0.086***	0.149***	0.240***
	(0.032)	(0.029)	(0.029)	(0.038)	(0.031)	(0.035)	(0.049)
CHANGE_OF_MAYOR	-0.665***	-0.660***	-0.536*	-0.615**	-0.639***	-0.922***	-2.171***
	(0.254)	(0.195)	(0.320)	(0.246)	(0.248)	(0.194)	(0.356)
YEAR	0.099	0.059	0.134+	0.108	0.100	0.094	0.275**
	(0.070)	(0.061)	(0.089)	(0.109)	(0.078)	(0.107)	(0.111)
SIZE	1.465	1.767	1.738	0.377	1.212	0.310	-0.927
	(1.661)	(1.617)	(1.992)	(1.740)	(1.536)	(1.446)	(1.646)
BUILD	-0.509	-1.119***	-0.348	-0.494	-0.479	-1.045**	-1.956**
	(0.383)	(0.337)	(0.408)	(0.420)	(0.360)	(0.423)	(0.835)
CLUSTER_CITY	yes	yes	yes	yes	yes	yes	yes
INTERCEPT	-200.043	-118.648	-269.018+	-218.532	-202.372	-191.057	-554.297**
	(141.750)	(122.284)	(179.472)	(218.843)	(156.583)	(214.185)	(223.780)
R^2	0.14	0.21	0.19	0.28	0.16	0.45	0.57
PREDICT	72.3	74.5	71.3	72.3	74.5	84	85.1
N	96	96	96	96	96	96	96

Level of significance: $^+$:15%, *:10%, **:5%, ***:1%.

Table 3: Estimation results from Probit analyses for Public Procurement contracts

	Model 0 Probit	Model 1 Probit	Model 2 Probit	Model 3 Probit	Model 4 Probit	Model 5 Probit	Model 6 Probit
			Dependant variable : **RENEWED**				
RENEG_DUMMY	-0.077						
	(0.306)						
CELERITY		-0.164***				-0.219***	-0.224***
		(0.046)				(0.034)	(0.036)
LAST		0.019				0.014	0.063
		(0.079)				(0.077)	(0.108)
AV_RENEG			-0.132			0.045	0.116
			(0.346)			(0.391)	(0.316)
AV_RENEG^2			0.085			0.049+	0.027
			(0.104)			(0.033)	(0.020)
Type of Renegotiations							
REN_INDEXATION				.		.	.
				.		.	.
REN_INVESTMENT				-0.634		-0.419	-0.139
				(0.587)		(0.738)	(0.978)
REN_QUALITY				-0.067		-0.292	-0.271
				(0.629)		(0.530)	(0.572)
REN_FINAN_EQ				-3.221***		-3.059***	-2.324***
				(0.359)		(0.508)	(0.628)
REN_PERIMETER				.		.	.
				.		.	.
REN_DURATION				0.008		-0.247	-0.123
				(0.060)		(0.198)	(0.343)
Scope of Renegotiations							
SCOPE					-0.130	0.039	
					(0.159)	(0.206)	
ONE_DIMENSION							-0.344
							(0.710)
TWO_DIMENSIONS							-0.719
							(0.533)
THREE_DIMENSIONS							.
FOUR_DIMENSIONS							-0.789
							(1.845)
FIVE_DIMENSIONS							.
Control Variables							
RENEWED$_{t-1}$	0.379+	0.324	0.404+	0.346	0.355	0.302	0.256
	(0.260)	(0.306)	(0.253)	(0.304)	(0.264)	(0.241)	(0.229)
PAST_EXPERIENCES	-0.047	-0.057*	-0.045+	-0.038	-0.058+	-0.052	-0.049
	(0.032)	(0.032)	(0.031)	(0.031)	(0.039)	(0.040)	(0.045)
MULTICONTRACT	-0.193	-0.259	-0.260	-0.214	-0.159	-0.281	-0.312
	(0.252)	(0.220)	(0.236)	(0.325)	(0.248)	(0.286)	(0.328)
SAME_AREA	0.022+	0.024*	0.022+	0.037**	0.023+	0.042***	0.040***
	(0.014)	(0.013)	(0.014)	(0.015)	(0.014)	(0.015)	(0.015)
CHANGE_OF_MAYOR	-0.691*	-0.610+	-0.757**	-0.733**	-0.643+	-0.660**	-0.641+
	(0.394)	(0.408)	(0.375)	(0.332)	(0.393)	(0.328)	(0.434)
YEAR	0.051	0.071	0.057	0.003	0.062	0.030	0.060
	(0.068)	(0.073)	(0.074)	(0.095)	(0.068)	(0.099)	(0.085)
SIZE	-2.479	-1.534	-2.152	-2.913	-2.117	-1.782	-2.318
	(2.397)	(2.467)	(2.341)	(2.427)	(2.582)	(2.468)	(2.351)
CLUSTER_CITY	yes	yes	yes	yes	yes	yes	yes
INTERCEPT	-100.230	-141.354	-113.778	-4.922	-123.234	-58.998	-120.107
	(137.140)	(147.131)	(148.308)	(190.514)	(135.532)	(199.393)	(170.746)
R^2	0.09	0.11	0.10	0.12	0.10	0.16	0.17
PREDICT	78.5	78.5	79.1	78.3	77.2	77.5	77.2
N	159	159	159	159	159	159	159

Level of significance: $^+$:15%, *:10%, **:5%, ***:1%.

7 Appendix

Table 4: Variables : definitions

| Variables	Definitions
RENEWED	dummy variable equal to 1 if the expired contract was followed by a renewal
RENEG_DUMMY	dummy variable equal to 1 if the expired contract was renegotiated
CELERITY	time lag between the signature of the contract and the first renegotiation, divided by the duration
LAST	time lag between the expiration of the contract and the last renegotiation, divided by the duration
AV_RENEG	number of renegotiations per year
AV_RENEG^2	square of the number of renegotiations per year
AV_TARIFFS	number of renegotiations per year dealing with a change in tariffs
AV_INDEX	number of renegotiations per year dealing with a change in the indexation clause
AV_INVEST	number of renegotiations per year dealing with a new investment
AV_QUALITY	number of renegotiations per year dealing with a quality improvement
AV_FINAN_EQ	number of renegotiations per year dealing with a change in the financial equilibrium
AV_PERIMETER	number of renegotiations per year dealing with an evolution of the perimeter
AV_DURATION	number of renegotiations per year dealing with a change in the contract duration
SCOPE	number of dimensions renegotiated during the contract
ONE_DIMENSION	dummy equal to 1 if the contract was renegotiated in one dimension
TWO_DIMENSIONS	dummy equal to 1 if the contract was renegotiated in two dimensions
THREE_DIMENSIONS	dummy equal to 1 if the contract was renegotiated in three dimensions
FOUR_DIMENSIONS	dummy equal to 1 if the contract was renegotiated in four dimensions
FIVE_DIMENSIONS	dummy equal to 1 if the contract was renegotiated in five dimensions
RENEWED$_{t-1}$	dummy variable equal to 1 if the expired contract is already a renewal of a previous one
PAST_EXPERIENCES	number of other expired contracts the private operator and the public authority had together at the date of expiration
MULTICONTRACT	number of other contracts the private operator and the public authority currently have together at the date of expiration
SAME_AREA	number of other public authorities in the same region with wich the operator has contracts at the date of expiration
CHANGE_OF_MAYOR	dummy variable equal to 1 if there was a change of mayor during the last year before the end of the contract
YEAR	year of expiration of the contract
SIZE	number of inhabitants of the municipality at the date of expiration
BUILD	dummy variable equal to 1 if the construction of the infrastructure was included in the contract
DURATION	duration of the contract

Table 5: Variables : descriptives statistics

Variables	Delegated Management					Public Procurement				
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max
RENEWED	96	0,44	0,50	0,00	1,00	155	0,78	0,42	0,00	1,00
RENEG_DUMMY	96	0,88	0,32	0,00	1,00	155	0,44	0,50	0,00	1,00
CELERITY	96	3,75	4,93	0,00	30,00	155	0,68	1,56	0,00	12,00
LAST	96	8,20	8,69	0,00	34,00	155	0,85	1,99	0,00	13,00
AV_RENEG	96	0,37	0,41	0,00	2,50	155	0,45	0,91	0,00	8,00
AV_RENEG^2	96	0,31	0,74	0,00	6,25	155	1,02	5,27	0,00	64,00
AV_TARIFFS	96	0,05	0,15	0,00	1,00	155	0,03	0,20	0,00	2,00
AV_INDEX	96	0,02	0,05	0,00	0,20	155	0,07	0,24	0,00	2,00
AV_INVEST	96	0,08	0,20	0,00	1,00	155	0,06	0,23	0,00	2,00
AV_QUALITY	96	0,04	0,09	0,00	0,40	155	0,05	0,25	0,00	2,00
AV_FINAN_EQ	96	0,01	0,04	0,00	0,22	155	0,02	0,11	0,00	1,00
AV_PERIMETER	96	0,00	0,02	0,00	0,14	155	0,00	0,00	0,00	0,00
AV_DURATION	96	0,14	0,23	0,00	1,33	155	0,20	0,78	0,00	8,00
SCOPE	96	1,51	1,54	0,00	5,00	155	0,45	0,87	0,00	4,00
ONE_DIMENSION	96	0,29	0,46	0,00	1,00	155	0,20	0,40	0,00	1,00
TWO_DIMENSIONS	96	0,16	0,36	0,00	1,00	155	0,04	0,19	0,00	1,00
THREE_DIMENSIONS	96	0,07	0,26	0,00	1,00	155	0,04	0,19	0,00	1,00
FOUR_DIMENSIONS	96	0,09	0,29	0,00	1,00	155	0,02	0,13	0,00	1,00
FIVE_DIMENSIONS	96	0,06	0,24	0,00	1,00	155	0,00	0,00	0,00	0,00
RENEWED$_{t-1}$	96	0,05	0,22	0,00	1,00	155	0,40	0,49	0,00	1,00
PAST_EXPERIENCES	94	2,02	2,26	0,00	11,00	155	2,66	3,28	0,00	14,00
MULTICONTRACT	96	0,67	0,47	0,00	1,00	155	0,53	0,50	0,00	1,00
SAME_AREA	96	4,97	5,57	0,00	19,00	155	4,98	5,25	0,00	19,00
CHANGE_OF_MAYOR	96	0,21	0,41	0,00	1,00	155	0,11	0,31	0,00	1,00
YEAR	96	2004,26	2,40	1996	2008	155	2005,26	2,05	1999	2008
SIZE	96	0,10	0,12	0,00	0,85	155	0,05	0,05	0,00	0,28
BUILD	96	0,17	0,37	0,00	1,00	155	0,00	0,00	0,00	0,00
DURATION	96	15,05	10,87	0,50	40,00	155	2,57	4,14	0,08	47,00

Table 6: Correlations

	1	2	3	4	5	6	7	8	9	10	11
1. RENEG_DUMMY	1.0000										
2. CELERITY	0.4117	1.0000									
3. LAST	0.4399	0.3121	1.0000								
4. AV_RENEG	0.4444	-0.0132	-0.0619	1.0000							
5. AV_RENEG^2	0.1452	-0.0514	-0.0625	0.8368	1.0000						
6. AV_TARIFFS	0.1638	0.0687	0.0148	0.3162	0.1464	1.0000					
7. AV_INDEX	0.2060	-0.0555	-0.0689	0.2742	0.0817	-0.0348	1.0000				
8. AV_INVEST	0.2447	0.0574	0.0364	0.3264	0.1028	0.5657	0.0881	1.0000			
9. AV_QUALITY	0.1948	0.0459	-0.0123	0.3509	0.1634	0.5953	-0.0157	0.4333	1.0000		
10. AV_FINAN_EQ	0.1239	0.0618	-0.0021	0.0598	-0.0062	-0.0069	0.0052	0.0614	0.0191	1.0000	
11. AV_PERIMETER	0.1052	0.1461	0.0752	0.0583	0.0010	0.0821	-0.0178	0.2334	0.0641	-0.0006	1.0000
12. AV_DURATION	0.1760	-0.0669	-0.0691	0.7278	0.8115	0.1505	-0.0174	0.1280	0.0988	0.0580	-0.0164
13. SCOPE	0.5294	0.4850	0.3135	0.3028	0.0862	0.3861	-0.0144	0.5102	0.3482	0.2179	0.3284
14. RENEWED$_{t-1}$	-0.2798	-0.2386	-0.2640	-0.0999	-0.0661	0.0119	0.1678	-0.0396	0.0349	-0.0520	0.0216
15. PAST_EXPERIENCES	-0.0679	-0.0962	0.0036	-0.0761	-0.0514	-0.0852	0.0142	-0.0825	-0.0641	-0.0388	-0.0478
16. MULTICONTRACT	0.1246	-0.0176	0.0848	0.0917	0.0917	-0.0219	0.0694	-0.0202	0.0306	0.0273	-0.0081
17. SAME_AREA	-0.1284	-0.0849	-0.1019	-0.0139	-0.0127	0.1263	-0.1074	0.0085	0.0161	0.1217	-0.0294
18. CHANGE_OF_MAYOR	0.1500	0.1600	0.0454	0.0542	0.0309	0.0649	-0.0369	0.0764	-0.0338	-0.0378	0.0404
19. YEAR	-0.0694	-0.0720	-0.0175	-0.1180	-0.1077	-0.1595	0.1327	-0.0998	-0.0624	0.0147	0.0911
20. SIZE	0.1656	0.1652	0.2367	-0.0419	-0.0536	-0.0487	-0.0313	-0.0061	-0.0182	-0.0244	0.0036
21. BUILD	0.1761	0.1997	0.5098	-0.1029	-0.0457	-0.0471	-0.0640	-0.0384	-0.0482	-0.0250	-0.0340
22. DURATION	0.4132	0.5676	0.7521	-0.1622	-0.1021	-0.0209	-0.1188	-0.0181	-0.0543	0.0027	0.0710

	12	13	14	15	16	17	18	19	20	21	22
12. AV_DURATION	1.0000										
13. SCOPE	0.1458	1.0000									
14. RENEWED$_{t-1}$	-0.0260	-0.2234	1.0000								
15. PAST_EXPERIENCES	-0.0604	-0.1355	0.2661	1.0000							
16. MULTICONTRACT	0.0838	0.0748	-0.0583	0.5451	1.0000						
17. SAME_AREA	0.0145	-0.0700	0.0893	-0.0391	-0.1428	1.0000					
18. CHANGE_OF_MAYOR	-0.0031	0.1176	-0.1259	-0.1011	-0.0200	0.0448	1.0000				
19. YEAR	-0.0830	-0.0740	0.3720	0.1986	-0.0633	-0.0857	-0.1355	1.0000			
20. SIZE	-0.0221	0.1130	-0.1241	0.4215	0.4046	-0.2081	0.0734	-0.0369	1.0000		
21. BUILD	-0.0650	0.1061	-0.1583	0.0323	0.0179	-0.0374	0.0759	0.0203	0.2352	1.0000	
22. DURATION	-0.1358	0.3107	-0.3511	-0.0455	0.0268	-0.1218	0.1951	-0.0339	0.2713	0.6707	1.0000

Figure 1: Optimal level of Renegotiations
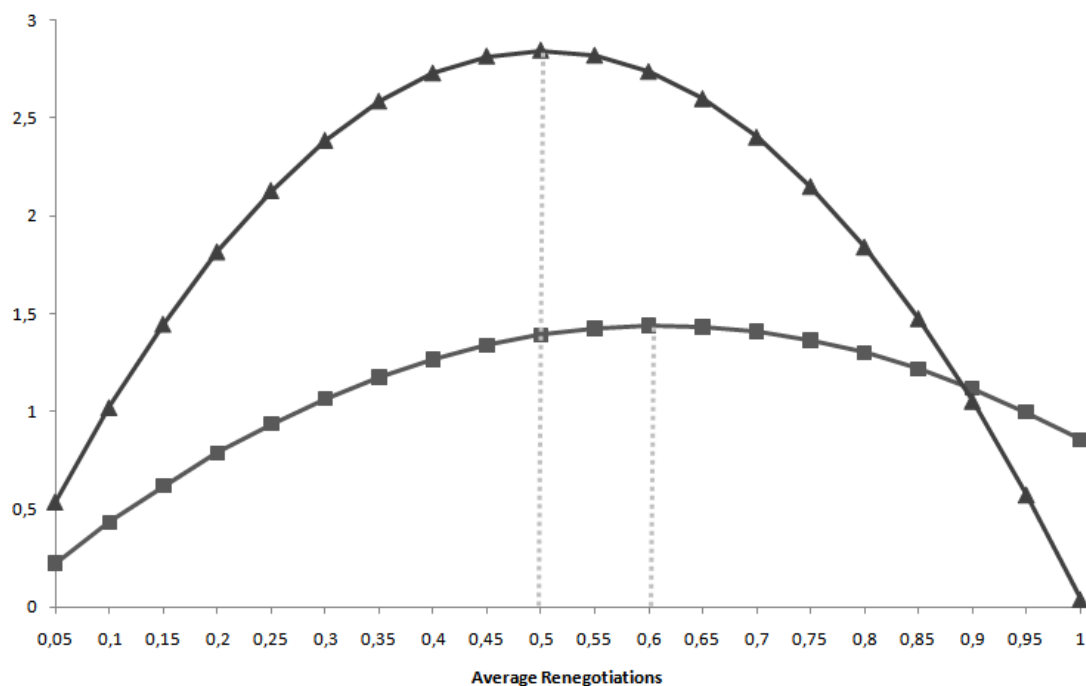
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