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***Political Contestability and Contract
Rigidity: An Analysis of Procurement
Contracts***

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Political Contestability and Contract Rigidity: An Analysis of Procurement Contracts*

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Abstract

We compare procurement contracts where the procurer is either a public agent or a private corporation. Using algorithmic data reading and textual analysis on a rich dataset of contracts for a standardized product and service from a single provider, we find that public contracts feature more rigidity clauses than private-to-private contracts and their renegotiation is formalized more frequently in amendments. We further compare in-sample public contracts and find similar patterns rising in political contestability using several measures. We argue that a significant part of the contractual rigidity difference between purely private and public contracts due to the specific nature of public contracts which are more permeable to the political environment.

Keywords: Contractual Rigidity, Private and Public Procurement, Political Contestability, Renegotiation

JEL Classification: D23, D72, D73, D78, H57

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1 Introduction

In this paper, we analyze the difference in public versus private procurement on a large number of contracts. We build on Spiller [2008] and Moszoro and Spiller [2012, 2014], arguing that public-private contracts are characterized by intrinsic differences stemming from third-party opportunism (TPO hereafter), i.e., a substantial amount of supervision and control is done by third parties such as political contesters and interest groups. A fundamental difference between private and public contracts is that public contracts are subject to public oversight. Thus, although politics is normally not necessary to understand private contracting, it becomes fundamental to understanding public contracting. This marks a big difference from private contracting: When faced with unforeseen or unexpected circumstances, private parties, as long as the relationship remains worthwhile, adjust their required performance without the need for costly and formal renegotiation; this is called relational contracting (Baker et al. [2002]).

Public contracting, on the other hand, is characterized by formalized, standardized, bureaucratic, and rigid procedures, partly because politics must be secured against third-party opportunism. This effect is reinforced by the risk of government opportunism leading private parties to push for rigid contracts (Moszoro and Spiller [2014]). Contract rigidity refers to rule-based (bureaucratic) implementation; i.e., the addition of contractual provisions and specifications that impose *ex-post* stiff enforcement, intolerance to adaptation, and penalties for deviation.¹ Therefore, contract rigidity—although generally correlated with—differs from Arrow-Debreu’s [1954] state-contingent contracts, which point to the *ex-ante* complexity of the subject and the completeness of the clauses, technical provisions, and processing costs (Laffont and Tirole [1993]). From the contractor’s perspective, contractual rigidity minimizes the risk of governmental opportunism, i.e., unfair administrative treat and unfavorable renegotiations (e.g., creeping expropriation).

Building on these characteristics of public contracting, we derived three testable propositions. First, public contracts are more rigid than equivalent transactions governed under private contracting due to public accountability. Second, contracts signed with public authorities that are more likely to be challenged by third parties (i.e., more politically contestable) are characterized by more rigid procedures than other public contracts; i.e., public authorities subject to third-party challenges increase the *proceduralization* of contractual agreements to signal probity. Third, public contracts renegotiations are more frequently formalized through amendments because of their initial rigidity (i.e., no relational adaptation).

To test these propositions we collected unique data and used a cutting-edge methodology. Our data concern car park contracts signed between 1985 and 2009 in France. In our dataset, we analyzed 396 contracts (and 793 amendments) signed between one private operator and 24

¹In this regard, contract rigidity is the opposite of “best efforts” or “reasonable adaptation” clauses.

private procurers (which we call “private contracts”) and between the same private operator and 141 public authorities (which we call “public contracts”). In addition, we also collected data on local elections and we propose several measures of political contestability. Because there is only one contractor and car parks arguably entail a standardized product and service, a large part of the heterogeneity comes from the procurers’ characteristics and time-varying political contestability.

Our setup and results are not French- or civil-law specific; it is our contention that they are extendable to different jurisdictions and types of law. In all countries politicians face similar risks, which refer not only to the legal challenges at court, but foremost to politically motivated challenges that affects the public agent’s *ex-ante* reputation. Moreover, our sample comes from one country under a unitary government model, thus the law regime is a common treat to all contracts and is not affecting the marginal response of public agents to political hazards.

Analogously to [Schwartz and Watson \[2012\]](#), we characterize this rich sample of contracts using algorithmic data reading and textual analysis. We find that public contracts feature more rigidity clauses and their renegotiation is formalized in amendments. We further compare in-sample public contracts and find similar patterns rising in political contestability using several measures. We argue that a significant part of the contractual rigidity difference between purely private and public contracts is a signaling device and political risk adaptation of the public agent to keep at bay plausible challenges from political contesters and interest groups. Complementarily, where firms anticipate a politically unstable environment that may lead to (incremental) expropriation, they will require rigid terms to minimize governmental opportunism.² We also find, as expected, that public contracts are more frequently renegotiated than private contracts.

Our results clearly fit into the literature in strategic management arguing that organizations which are characterized by high degrees of “publicness” differ from “private” organizations because they are more permeable to the external environment, and notably the political environment [[Meier and O’Toole, 2011](#); [Ring and Perry, 1985](#)]. In this paper, we empirically test this permeability, focusing in particular on the degree of contractual formalism.

Our study contributes to contract theory by advancing a novel set of propositions based on third-party hazards faced by public, but not by private, procurers. Our results suggest that previous empirical studies pointing to the inefficiencies of public-private contracts related to high renegotiation rates ([Guasch \[2004\]](#); [Guasch et al. \[2008\]](#)) might be somewhat misleading. Frequent renegotiations observed in public contracts ([Guasch \[2004\]](#); [Beuve et al. \[2014\]](#)) can be understood as a consequence of their specific nature instead of a manifestation of

²See [Spiller \[2008\]](#) and [Moszoro and Spiller \[2014\]](#) for an explanation of the interplay between third-party and governmental opportunism in public contracting. The disentangling of the two channels of rigidity, however, is empirically hard.

opportunism: “In a sense, it is possible to say that the frequency of contract renegotiation may provide concessions a ‘relational’ quality” (Spiller [2008, p. 22]). An important corollary is that the perceived inefficiency of public contracting is largely the result of contractual adaptation to different inherent hazards and thus is not directly remediable.

The paper is organized as follows: In section 2, we return to the specificities of public contracting and what Moszoro and Spiller [2012] call third-party opportunism, and derive propositions concerning rigidity and political contestability of public contracts. In section 3, we present our data and our empirical strategy to test our propositions. Section 4 is dedicated to the results and robustness checks. Section 5 concludes.

2 Third-Party Opportunism and the Rigidity of Public Contracts

2.1 The Inefficiency of Public Contracts

2.1.1 Contractual Issues

Following Oliver Williamson’s [1976] canonical paper on franchise bidding pointing out contractual failures at different stages (i.e., selection, execution, and renewal stage), many recent papers investigated public-private contracting issues, including the question of competition versus negotiation in the selection stage (Bajari et al. [2011, 2009]; Lalive and Schmutzler [2011]; Vellez [2011]; Amaral et al. [2013]), collusion and corruption (Martimort and Straub [2006]), contract enforcement and renegotiations at the execution stage (Engel et al. [2009]; Gagnepain et al. [2013]; Guasch et al. [2007, 2008]; Chong et al. [2015]), as well as contract renewals (Beuve et al. [2014]). These studies built on several theoretical frameworks that emphasize problems with asymmetric information, incomplete contracting, and transaction costs. They do not emphasize the specific nature of public contracts.

On one hand, agency theory focuses on incentives to overcome asymmetric information. However, as Malin and Martimort [2000] stated and following Sappington and Stiglitz’s [1987] irrelevance theorem, agency theory “has nothing to say about such things as the distribution of authority within an organization, the limits of the firm, the separation between the public and the private spheres of the economy, and more generally nothing to say about organizational forms and designs” (Malin and Martimort [2000, pp. 127–128]). For agency theory to add something to these issues, incentive models must take into account various forms of easily describable transaction costs that lead to contract incompletenesses. This can be accomplished by adding *ad hoc* assumptions such as limited commitment of the government. An example is given by Guasch et al. [2008], who stressed government’s failure to commit not to renegotiate.

On the other hand, incomplete contract theory (Hart et al. [1997]; Hart [2003]) postulates

that contracts are incomplete and always renegotiated, leading to inefficiencies (i.e., renegotiation is efficient, but because it concerns the surplus net of initial investments, it leads to hold-up).

Transaction-cost theory proposes a middle position, stating that contracts are incomplete and viewing renegotiation as a necessary albeit costly process, suggesting that an optimal level of contract completeness and thus an optimal level of renegotiation exist (Crocker and Reynolds [1993]; Masten and Saussier [2000]; Saussier [2000]).

Whatever the theoretical frameworks considered, very few address the specific nature, if any, of public versus private contracting. Exceptions are Spiller [2008, 2013] and Moszoro and Spiller [2012, 2014], who insisted on the specific nature of public contracts and provided a more nuanced interpretation of the renegotiation rates observed in public contracts.

2.1.2 Public-Private Contracts and Renegotiations

Because of the general interest of the services they encompass, public contracts have been scrutinized especially closely by researchers. One striking piece of evidence is that very often public contracts are renegotiated. Guasch [2004] has provided many examples of renegotiations in public-private agreements; by studying more than 1,000 concession contracts signed in Latin American countries between the mid-1980s and 2000, he found that 78% of transportation contracts and 92% of water and sanitation contracts were renegotiated. Guasch's findings also confirmed that renegotiations occur shortly after the award (on average, after 2.2 years) and often, at first glance, favor the private party. Guasch [2004] suggested that renegotiations are a consequence of aggressive bids in the context of an *ex-ante* lack of commitment from the government. Because the government cannot commit not to renegotiate and because firms only learn their types after bidding, if a firm wins a call for tender and discovers it is inefficient (i.e., it would lead to losses), it would be tempted to renegotiate (Laffont [2003]; Guasch and Straub [2006]; Guasch et al. [2008]).

Other scholars have explored alternative explanations, including government-led renegotiations (Guasch et al. [2007]) and renegotiations without hold-up that enable incumbent governments to circumvent budgetary rules before elections (Engel et al. [2009]). However, as Guasch et al. [2008, p. 421] stated, “such high rates of contract renegotiation have raised serious questions about the viability of the concession model in developing countries.”

It is fair to recognize that high rates of renegotiation are not specific to developing countries. Other studies have reported very high renegotiation rates in the United Kingdom (NAO [2003]), United States (Engel et al. [2011]), and France (Athias and Saussier [2007]; Beuve et al. [2014]). Regardless of the theoretical framework mobilized to analyze contractual issues at stake in public-private contracts, the high rate of renegotiation always comes as bad news. However, as soon as the specific nature of public private contracts is recognized, this change of perspective requires us to think differently to those contractual issues and leads us to a

new set of propositions.

2.1.3 The Specific Nature of Public-Private Contracts

According to [Ring and Perry \[1985\]](#), the differences between public and private sectors arise from the fact that they operate in highly different environments. The authors notably argue that public organizations are much more permeable to the external environment: they must cope with the scrutiny of media and of constituents. Moreover, public managers are subject to more artificial time constraints (*e.g.* elections) than private managers. More recently, authors in contract theory [[Moszoro and Spiller, 2012, 2014](#); [Spiller, 2008](#)] put forward the same type of argument: public contracts differ from private contracts because the contracting partners are subject to an additional type of opportunism, namely third-party opportunism. This notion of third-party opportunism is very close to the one of permeability to the external environment: interested external groups (*e.g.* political competitors) have incentives to challenge public contracts. The fact that public contracts are subject to public scrutiny and oversight makes a fundamental difference between private and public contracts: politics, which is normally not involved in understanding private contracting, becomes fundamental to understanding public contracting. A consequence of this is that (opportunistic) third parties prevent the use of relational contracts for public-private arrangements.

Many examples can be found illustrating third-party opportunism and its consequences on contractual practices. [Engel et al. \[2014, Box 3.1\]](#) gave the example of a forestry company in Latin America that contracted for the construction and maintenance of a 60 kilometer (37 miles) road network of six roads for heavy trucks within its forests. The contract specified the contract duration, a unit price per kilometer and the payment schedule, building standards (such as width and thickness of asphalt), service standard requirements, and penalties for deviations from these requirements. This private road construction contract was ten pages long. A comparable public contract usually has several hundred pages. This example illustrates the difficulty to rely on relational contracts for public-private relationships.

The fact that public contracts are subject to political hazards alien to private contracts is also illustrated by [Hennessey \[2012, p. 7\]](#). He related that Michael O’Shaughnessy, chief engineer of the Hetch Hetchy Aqueduct—an astounding water and power system comprising of 60 miles of tunnels through solid granite, 280 miles of pipelines, four major dams and powerhouses, two treatment plants, and 11 reservoirs—commented in his account of the project that he “never handled any proposition where the engineering problems were so simple and the political ones so complex.”

Examples of political interferences in public contract life can also be found in the sector and the country we focus on in this paper. In Saint-Etienne city, the daily regional press reported in June 2015 that the city council majority raised prices by renegotiating underground car parks contracts entrusted to private partners in order to comply with a new legislative

framework³. The new fee schedule was then submitted to the vote of the city council. The argument was refuted by the opposition, which publicly blamed the majority for conducting negotiations as “altar boys.” One of the political opponents of the mayor even declared that the contract was “either a gift, or poorly negotiated.” the city council majority replied by blaming the former mayor about the absence of contract enforcement in the past.⁴

Third-party opportunism refers to the fact that public contracts are subject to public scrutiny so as to avoid corruption and graft. This scrutiny is undertaken not only by designated agencies in charge of contract supervision, but also carried out by interested third parties that may behave opportunistically and challenge the “*probity*” of a public agent. This is not specific to public contracting. However, even in the face of third-party opportunism, companies normally rely on inter-firm relationships to support contracting (Macaulay [1963]) through informal and continuous adaptations.⁵

On top of that, private investors are subject to the risk of governmental opportunism. Governmental opportunism consists of the ability of governments to change the rules of the game through the standard use of administrative powers to extract quasi-rents from infrastructure investors (Spiller [1995]). The existence of sunk investments makes governmental opportunism a fundamental hazard in government–investor interactions. Sunk investments provide politicians with the opportunity to behave opportunistically *vis-à-vis* the investing company, exposing it to the risk of (creeping) expropriation. Facing the threat of governmental opportunism, infrastructure investors will require particular safeguards to invest, i.e., the development of institutional arrangements that will limit the government’s ability to behave opportunistically once the investor undertook its investment program.⁶

The exposure to third-party and governmental opportunism increases the risk to both the public agent and the private party. In response, both will have incentives to increase the rigidity of these contracts as compared to equivalent contracts between private parties. That is why, because of their nature, public contracts are born with less flexibility than purely private contracts (Spiller [2008, p. 21]).

³The “Hamon Law” on consumption, adopted in March 18, 2014. The new law requires a pricing for 15 minutes in order to allow car drivers to pay closer to their actual consumption.

⁴Xavier Alix, “Parkings stéphanois: une renégociation plus ou moins bonne?”, *L’Essor*, June 10, 2015. Available at: <http://lessor.fr/parkings-une-renegociation-plus-ou-moins-bonne-10303.html> (accessed July 31, 2015).

⁵Relational contracts are defined as informal commitments governing non-contractible actions and sustained by the value of future transactions (Bull [1987]; Baker et al. [2002]). When the discounted payoff stream from commitment to this informal agreement is higher than the discounted payoff stream from deviation, a relational contract is sustainable and allows avoiding *ex-post* opportunism.

⁶For example, safeguards will have to stipulate price setting and conflict resolution procedures (arbitration or judicial), investment policies, quality controls, etc., that are both difficult for the government to by-pass and limited in their discretionary interpretation. In other words, regulatory procedures, if credible, must restrain the government from opportunistically expropriating the investor’s sunk investments (Spiller [2013]).

2.2 Public Contract Rigidity: Propositions

In this section, we highlight trade-offs at stake when third-party opportunism is introduced. On the one hand, contracting costs rise exponentially with contract rigidity and determine the trade-off between interpretation accuracy and cost of contract writing (Schwartz and Watson [2012]). On the other hand, Moszoro and Spiller [2012] found that the lack of flexibility in public procurement design and implementation reflects public agents’ political risk adaptation to limit hazards from opportunistic third parties—political opponents, competitors, interest groups—while externalizing the associated adaptation costs to the public at large. Thus, public agents minimize both contracting and political costs, expressed as:

$$\underset{R}{\text{minimize}} \Phi = T_0 \rho(R)\tau(R) + K(R) \quad (1)$$

where $K(R)$ is adaptation costs rising exponentially in contract rigidity R , ρ is the likelihood of a challenge by an opportunistic third party and τ is the likelihood of success of an opportunistic challenge decreasing in contract rigidity, and T_0 is the public agent’s (political) cost if a challenge by third parties succeeds.

Third parties observe benefits from opportunistic challenges, but the public agent does not know *ex ante* the particular value of these benefits to third parties. Third parties’ overall benefits from an opportunistic challenge correspond to a random normally distributed variable \widetilde{T}_0 . Equation (2) shows that in equilibrium third parties challenge a contract only if expected gains $\widetilde{T}_0\zeta\tau$ are bigger than litigation costs $c(R)$:

$$\rho \equiv \Pr[\widetilde{T}_0\zeta\tau(R) > c(R)], \quad (2)$$

where $\zeta \in [0, 1]$ is a political contestability parameter. If $\zeta = 1$, the opportunistic challenger’s benefits are symmetrical to the incumbent public agent’s costs (e.g., a bipartisan political market); if $\zeta < 1$, the political market is fragmented and the challenger does not internalize all benefits from a successful contract protest, i.e., if political contestability is low, the probability of an opportunistic challenge will be also low. Political contestability ζ is universal parameter: It is inversely correlated to the ruling party’s strength (e.g., measured by electoral race winning margins) and the costs of oversight (e.g., captured by the number of partisan lists in an election), and proportional to the probability of a partisan swing.⁷

Litigation costs $c(R)$ rise in R . Reduced flexibility limits the likelihood of an opportunistic challenge by lowering third parties’ expected gains and increasing litigation costs. Any deviation from equilibrium rigidity R^* makes the public agent worse off:

1. If $R < R^*$, then $\tau(R) > \tau(R^*)$, $c(R) < c(R^*)$, therefore $\rho > \rho^*$ and $T_0 \rho(R)\tau(R) -$

⁷In our empirical strategy in section 3, we use several political measures that capture different aspects of political oversight and competition.

$T_0 \rho(R^*)\tau(R^*) > K(R^*) - K(R)$ (increase in political cost offsets gains in decreased contracting cost)

2. If $R > R^*$, then $T_0 \rho(R^*)\tau(R^*) - T_0 \rho(R)\tau(R) < K(R) - K(R^*)$ (contracting cost increase outmatches gains in political cost decrease)

Moszoro and Spiller’s [2012] model yields two testable predictions on the contractual features, depending on the characteristics of the contracting parties:

Proposition 1. *In the absence of political costs, equilibrium contract rigidity is lower than when political costs are high; therefore contracts subject to public scrutiny have more rigidity clauses than purely private relational contracts.*

Proposition 2. *In contestable political markets (high ζ), contracts have more rigidity clauses than in monopolized or atomized political markets (low ζ).*

Furthermore, rule-based contracts imply that they are less adaptable to unforeseen contingencies. Due to public oversight, public contract adaptations will need to be introduced through formal amendments. Therefore, we can draw a third prediction regarding public versus private contracts:

Proposition 3. *Public contracts are more likely to be renegotiated through formal amendments than private contracts.*

We test these propositions using a novel dataset comprised of public-private and purely private contracts for car parks in France. Our focus is on contract characteristics and third-party scrutiny.

Corruption is of minor concern to our setting. First, third-party opportunism refers to signaling probity *ex ante*, i.e., endogenizing anti-corruption rules by increased rigidity. Corruption, thus, would lead to less, not more rigidity of public contracts. Second, we analyze actual signed contracts, not bid specifications. While very detailed bid specifications could point to a particular contractor and preclude competition (Lambert-Mogiliansky and Kosenok [2009]), there is no use for a corrupted public agent to restrict the favored bidder at the contracting stage. Thus, corruption (if any) would bias our estimates towards less rigidity in public contracting. Third, we analyze contracts with a single contractor with public administrations and private companies. This contractor is the largest car park company in France: Unless the whole sector is captured by this operator, the reputational spillovers of corruption charges can easily be assumed to outweigh the plausible gains from unlawful practices.

We are also confident of the limited ability of corporations to buy favors through donations to political candidates or parties. According to French law, no legal entity is allowed to participate in financing a political candidate, party, or group unless the legal entity is a

political party or a political group. Financing is not allowed in any form whether direct (e.g., by donating money or properties) or indirect (e.g., by rendering services, providing products below regular market fees or prices), or granting favors or advantages to political candidates, parties, groups, their financial representatives, or associations. Parties are funded exclusively through the central budget.⁸

3 Empirical Analysis

3.1 Sector and Contract Characteristics

In many European countries, cities are responsible for providing on-street and off-street car parks. The positive externalities and social benefits (e.g., environmental concerns, intermodality, urban development) derived from a high-quality construction and efficient management of car parks justify their remit to local authorities. Although the public authorities must retain ownership and control of car parks, they can outsource the provision of such infrastructure and services through public-private arrangements.

In France, as in many other countries, outsourcing car parks construction and/or management to private operators has been widespread.⁹ As a consequence, the sector is characterized by strong competition between national and international companies¹⁰ as well as local firms (Baffray and Gattet [2009]). Moreover, the competitive pressure also comes from the possibility of municipalities returning to in-house provision when contracts end. The sector is characterized by the existence of three main contractual arrangements: “concession”, “operating,” and “provision of services” contracts.

Concession Contracts: For greenfield and substantial brownfield car park developments, municipalities use concession contracts. These are long-term contracts (30 years on average in our dataset), which provide sufficient time for private operators to invest and to pay off the debt. In such contracts, the operator bears the demand risk and is remunerated with user fees. The direct consequence is that long-term contracts are subject to the political, economic, social, and technical changes that may occur during the execution of the contract. Such changes may be exogenous to the contract (technological developments, economic shocks, changes in legislation or legal interpretation), or may directly result from internal drivers (evolving business requirements) or contract maladaptations (inappropriate initial contractual design). Such changes may then involve adaptations to the service.

⁸See: Library of Congress, *Campaign Finance, France*, <http://www.loc.gov/law/help/campaign-finance/france.php> (accessed February 24, 2015).

⁹According to the French Ministry of Sustainable Development, in 2009 73% of car parks were organized *via* outsourced management and 27% were provided in-house through public provision.

¹⁰Vinci Park, Q-Park, Epolia, Efia, Interparking, Parking de France, UrbisPark, AutoCité and SAGS are the most frequent bidders in France.

Operating Contracts: When the car park is already built and requires a significant level of investment to renovate and maintain, operating contracts are used. These contracts are shorter than concession contracts (18.2 years on average in our dataset). As with concession contracts, the operator bears the demand risk and is remunerated with user fees. Likewise, operating contracts are subject to the political, economic, social, and technical changes that may occur during execution of the contract.

Provision of Services Contracts: For on-street car parks as well as for already built car parks which require no investments, provision of services contracts are used. These are shorter contracts (3.2 years on average in our dataset).

3.2 Contractual and Political Data

In the French car parking sector, there is no regulatory authority and data are not centralized. To generate the dataset used in this study, we gathered all contracts signed by the leading company in the French market (42% market share among private operators; 30.6% total market share) between 1963 and 2009. Overall, we assessed 396 contracts and 792 amendments to contracts with 152 municipalities and 24 private contractees dispersed in 58 departments (out of 96) in metropolitan France.¹¹

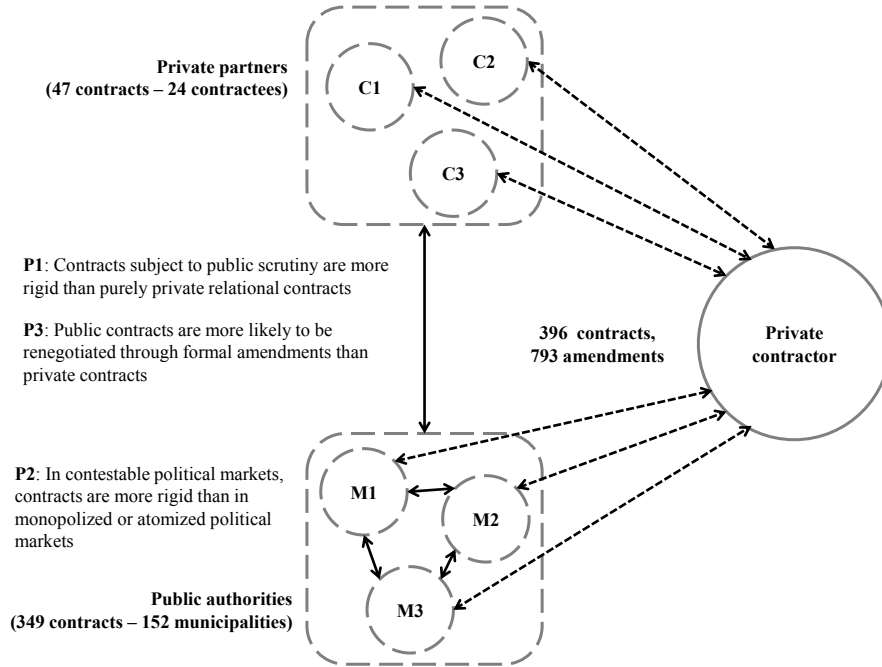
Concerning political data, we gathered the outcome of all municipal elections from 1983 through 2008.¹² Elections are organized (in principle) every six years to elect the mayor and the members of the city council by a majority vote spread over two rounds (direct universal suffrage). Each mayoral candidate presents a list of potential deputies (as many deputies as number of seats on the city council). The list which obtains the higher result obtains 50% of the seats on the city council. The remaining seats are distributed among all lists of potential deputies (including the majority list) who received at least 5% of the votes cast.

The city council, chaired by the mayor, collectively has the legislative authority over municipal territory. More precisely, the council has jurisdiction to manage the affairs of the municipality through its decisions. Hence, the city council approves the budget prepared by the mayor and her deputies, determines local tax rates, creates or cancels communal jobs, allows acquisitions and disposals of communal property, approves loans, grants subsidies, and sets tariffs for communal services and on-street car parks. Figure 1 shows a graphic representation of our data and propositions.

¹¹Our contracts are primary arrangements: i.e., they are not “restarted contracts” that would disguise the amendment category.

¹²I.e., 1983, 1989, 1995, 2001, and 2008.

Figure 1: This figure presents a graphical representation of our data and propositions. In our sample, we have 396 contracts and 793 amendments from a single contractor, signed with 152 municipalities and 24 private contractees. Propositions 1 and 3 build on the heterogeneity of the public versus private samples, while Proposition 2 builds on the in-sample heterogeneity of time-varying and cross-section political contestability in municipalities.



3.3 Empirical Strategy

Our sample presents the ideal characteristics to test our propositions: there is only one contractor and car parks represent a standardized product. Therefore, a large part of the heterogeneity in our sample comes from the procurer’s characteristics (public versus private) as well as the cross-section and time-varying political contestability in the public administrations.

3.3.1 Dependent Variables

Contractual Rigidity

To assess the rigidity level of our contracts we follow [Schwartz and Watson \[2012\]](#), and introduce rigidity categories—arbitration, certification, evaluation, litigation, penalties, contingencies, design, and termination—and construct “dictionaries” by which we machine-read

contractual dimensions.¹³

These rigidity categories capture relevant contractual clauses that lower the likelihood of a challenge by opportunistic third parties. Our rationale for (and contribution to) the use of rigidity categories instead of the simple aggregate is to open the black box on contractual rigidity and assess its magnitude and significance at a granular level. Table (1) presents the list of words we searched for. These words univocally relate to their corresponding categories.¹⁴

Arbitration clauses submit plausible disputes to an arbitrator instead of a court.¹⁵ Certification clauses regulates the contractor. Evaluation clauses introduce duties regarding delivery. Litigation clauses appear in triggers to a lawsuit. Termination clauses signal ways to resolve intractable contract disruption. Contingency clauses make provisions for future possible, but uncertain events and circumstances. Finally, design clauses impose product or service features. Table 1 presents keywords clustered in eight rigidity categories¹⁶ and the total number of counted keywords for each of them. We created as many variables as rigidity dimensions.

Table 1: Keywords searched and grouped into contract rigidity categories.

<i>Arbitration</i>	appeal, arbitration, conciliation, guarantee, intervention, mediation, settlement, warranty, whereas ¹⁷	10,241
<i>Certification</i>	certification, permit, regulation	3,263
<i>Evaluation</i>	accountability, control, covenant, obligation, quality, specification, scrutiny	8,090
<i>Litigation</i>	court, dispute, indictment, jury, lawsuit, litigation, pleading, prosecution, trial	2,479
<i>Penalties</i>	damage, fine, indemnification, penalty, sanction	5,431
<i>Termination</i>	breach, cancel, dissolution, separation, termination, unilateral	580
<i>Contingencies</i>	contingent, if, provided that, providing that, subject to, whenever, whether	4,488
<i>Design</i>	anticipation, event, scenario, plan	109
Total		34,681

¹³See, for example, Parkhe [1993] for an application of categories for the analysis of contracts in the management literature and Loughran and McDonald [2011, 2014] for an analysis of corporate filings in the finance and accounting literature. Parkhe used dummy variables for periodic written reports of relevant transactions, prompt written notice of departures from the agreement, the right to examine and audit relevant records a firm of certified public accountants, designation of certain information as proprietary and subject to confidentiality provisions of the contract non-use of proprietary information even after termination of agreement, termination of agreement, arbitration clauses, and lawsuit provisions in a small contract sample. Loughran and McDonald used word count of negative words, positive words, uncertainty words, litigious words, strong modal words, and weak modal words in a large number of SEC filings.

¹⁴Word count is a brute form of contract analysis. Consulted contract law theorists and practitioners assured us, however, that it is highly unlikely that these words would be used in a context expressing the opposite of our classification category; i.e., if the word “termination” appears, it is unlikely that it would be to derogate a termination clause (e.g., as in “we are not going to terminate this contract”).

¹⁵Contracts submitting to arbitration have more details because there will be less deposition opportunities. Public contracts may have more arbitration clauses to minimize the risks of (unfavorable) court decisions. Public agents may also prefer arbitration because it is faster and more confidential than courts, so they are less exposed to third parties.

¹⁶We machine-read “stemmed” words, i.e., plurals (e.g., penalties) and variations (e.g., penalized) are also included.

In a multidimensional setting where each category is a dimension, the degree of difference between contracts can be measured by (a) the Cartesian distance between the points given by the vectors of word categories, (b) the difference in the angle of the vectors of word categories, and/or (c) the difference in frequencies of word categories. In the present study, we used the normalized frequencies of word categories (i.e., z -values). For instance, we transformed the word count result of *Arbitration* by calculating:

$$zArbitration = \frac{Arbitration - \mu}{\sigma} \quad (3)$$

where μ is the mean and σ is the standard deviation of the count of *Arbitration* words across all contracts. This gives us a global rigidity measure, $zRigidity$:

$$\begin{aligned} zRigidity = & zArbitration + zCertification + zEvaluation + zLitigation \\ & + zPenalties + zTermination + zContingencies + zDesign \end{aligned} \quad (4)$$

As an alternative measure of global rigidity, we also take the contracts' size into account, i.e., the total number of words of contracts. In other words, we make a double transformation by dividing the word count by the total number of words, then by using the normalized frequencies of word categories (i.e., y -values). Thus, we transformed the word count result of *Arbitration* in the following way:

$$xArbitration = \frac{Arbitration}{\ln(\text{totalnumberorwords})} \quad yArbitration = \frac{xArbitration - \mu}{\sigma} \quad (5)$$

where μ is the mean and σ is the standard deviation of the count of $xArbitration$ words across all contracts. This gives us an alternative global rigidity measure, $yRigidity$:

$$\begin{aligned} yRigidity = & yArbitration + yCertification + yEvaluation + yLitigation \\ & + yPenalties + yTermination + yContingencies + yDesign \end{aligned} \quad (6)$$

Our algorithmic data reading procedure is a rudimentary form of textual analysis. According to law scholars, however, it is unlikely that these words would appear in a context unrelated to the categories they indicate.¹⁸ Therefore, we are confident that our algorithm proxies and estimates the frequency of relevant contractual clauses in each contract.

Contract Renegotiations

To assess the number of formal renegotiations, we count the number of amendments of each contract. Then, in order to better capture their frequency, we create the variable

¹⁷See [Schwartz and Watson \[2012\]](#) for an explanation of the appropriateness of “whereas” as an arbitration keyword.

¹⁸For example, the word “arbitrator” is most likely to be embedded in an arbitration clause.

$Average_Amendments_{i,t}$ which correspond to the number of amendments of the contract i divided by its duration. Thus, this variable is the average number of renegotiations per year of contract i , which seems to better suit our purpose: renegotiating four times a two-year contract is not the same as a twenty-year contract. To avoid biasing our observations in favor of past and expired contracts, we divided the current number of amendments by the duration already elapsed by 2008 for more recent and on-going contracts.

3.3.2 Public versus Private Contracts

We created a dummy variable $Public$ that equals 1 when the contract is signed between the operator and a municipality, and 0 when the contract is signed with a private contractee (e.g., a corporation or shopping center).

3.3.3 Political Contestability

In order to study the influence of the political environment in public contracts, we define a set of different proxies to capture the level of political contestability at the city level. The first variable we define, $HHI_{m,t}$, is the Herfindahl-Hirschman index of the first round of elections preceding the date of signature:

$$HHI_{m,t} = A_{m,t}^2 + B_{m,t}^2 + C_{m,t}^2 + D_{m,t}^2 + \dots \quad (7)$$

where $A_{m,t}$ is the winning party's vote share in municipality m at time t , $B_{m,t}$ is the runner-up party's vote share, $C_{m,t}$ is the vote share of the party that came in third place, etc. According to our Proposition 2, we expect that a politically concentrated municipality will lead to less rigid contracts.

We also define two variables in order to capture the opposition force to the winning party. We take into account the number of different lists ($Number_Of_Lists_{m,t}$) that applied to the first round of elections and the concentration of all non-winning parties ($Residual_HHI_{m,t}$) in municipality m at time t , which measures the strength of political opposition. We expect here that the stronger the political opposition, the more rigid the contract. These two variables, thus, might have a positive impact on contractual rigidity.

$$Residual_HHI_{m,t} = \frac{(B_{m,t}^2 + C_{m,t}^2 + D_{m,t}^2 + \dots)}{(1 - A_{m,t})^2} \quad (8)$$

We expect the political contestability to be linked with the margin of victory of the winning party. We thus take into account the margin of victory ($Win_Margin_{m,t}$) between the winning and the runner-up party. We also introduce a square term of the variable ($Win_Margin_{m,t}^2$) to identify a possible non-linear effect, e.g., the winning party may be

concerned if margins are narrow or support is large, but less for intermediate states.

$$Win_Margin_{m,t} = A_{m,t} - B_{m,t} \quad (9)$$

$$Win_Margin_{m,t}^2 = (A_{m,t} - B_{m,t})^2 \quad (10)$$

Lastly, we expect the political contestability to be related with the distance to the next election. We define $Distance_{m,t}$, as the distance between the date of signature of the contract and the date of the future election. This variable simultaneously captures the closeness of the next elections and the mayor's tenure in office in the political cycle. Here, again, we introduce a square term $Distance_{m,t}^2$ since a non-linear effect could legitimately be expected. The intuition here is that we may find more rigid contracts closer to upcoming election years and less rigid contracts when elections are more distant in time.

These set of variables are complementary. Political scientists often refer to political competition and its implication in general terms. The rationale for using several measures is to measure the qualitatively graspable, but quantifiably tricky notion of political contestability.

3.3.4 Control Variables

Aside from the nature of the contract (public versus private) and the level of political contestability, other factors can be mobilized to explain contractual rigidity. As a consequence, we include a set of control variables. First, we take into account the three different contract types described in section 3.1 through three dummy variables: $Concession_{i,t}$, $Operating_{i,t}$, and $Provision_of_Services_{i,t}$. In the estimations, concession and provision of services contracts are compared to operating contracts. As these contractual arrangements correspond to different levels of investment and complexity, we should observe that concession contracts are more rigid than operating contracts, and operating contracts are more rigid than provision of services contracts. As contractual requirements can also vary among the same contract types, we take into account characteristics of services through the number of parking places ($Places_{i,t}$) and the type of services ($On-street_{i,t}$, $Underground_{i,t}$ or $Both_Services_{i,t}$) managed by the contract.

We also introduce variables controlling for the size of the city concerned with the contract (measured through the logarithm of the number of inhabitants, $Inhabitants_{i,t}$) and the political color of the mayor ($Left_Wing_{i,t}$ versus $Right_Wing_{i,t}$).

The observed level of heterogeneity could also come from the fact that contractors had a different level of common history. To control for that, we introduce the variables $Renewed_{i,t}$, which is a dummy equals to 1 if the contract is a renewed one, and $Experience_{i,t}$ and $Past_Contracts_{i,t}$ which respectively stand for the number of years the two contractors know each other (i.e., the difference between the date of signature and the date of signature of their

very first common contract) and the number of contracts they had already signed together in the past.

As the estimation results may be driven by unobserved characteristics of the sector which may have evolved over such a long period (24 years), we control for potential biases by introducing the variable $Trend_{i,t}$, which stands for the year of signature of the contract. Finally, we also cluster all our estimations at the geographical level (58 departments). Descriptive statistics and pairwise correlations of all the variables used in the empirical strategy are provided in Tables 4 and 5.

3.3.5 Identification Strategy

Our goal is to explore how public and private contracts differ concerning their level of rigidity. To do so, we estimate the following model:

$$Rigidity_{i,t} = Public_{i,t}\gamma + Y_{i,t}\alpha + \epsilon_{i,t} \quad (11)$$

where $Rigidity_{i,t}$ refers to our two measures of the rigidity level of contract i at date of contract signature t , $Public_{i,t}$ is the dummy variable indicating whether contract i signed at date t is a public contract, Y is a vector of control variables, and $\epsilon_{i,t}$ is the error term (we assume that $\epsilon_{i,t} \rightsquigarrow (0, \Sigma)$).

Then, we reduce the analysis scope on the subsample of public contracts in order to explore the impact of political contestability on the contractual rigidity. Hence, we estimate the following model:

$$Rigidity_{i,t} = X_{i,t}\alpha + Y_{i,t}\beta + \nu_{i,t} \quad (12)$$

where $Rigidity_{i,t}$ refers to our two measures of the rigidity level of contract i signed at date t , X is a vector of variables measuring political contestability, Y is the same vector of control variables as in equations (11), and $\nu_{i,t}$ is the error term ($\nu_{i,t} \rightsquigarrow (0, \Sigma)$).

Finally, we analyze the simple following model:

$$Average_Amendments_{i,t} = Public_{i,t}\alpha + Y_{i,t}\beta + \psi_{i,t} \quad (13)$$

where $Average_Amendments_{i,t}$ is the number of amendments divided by the duration of the contract i , $Public_{i,t}$ is the dummy variable indicating whether contract i signed at date t is a public contract, Y is a vector of control variables, and $\psi_{i,t}$ is the error term (we assume that $\psi_{i,t} \rightsquigarrow (0, \Sigma)$).

4 Results

4.1 Public versus Private Contract Rigidity

Total Rigidity

We first estimate the contract rigidity of public versus private contracts. Results are given in Table 6. Model 1, which provides the simplest estimation, support our first proposition. Indeed, the coefficient associated with our variable *Public* is positive and significant, meaning that public contracts are more rigid than private contracts. For the car park sector, our data show that public contracts are, on average, of longer term than private contracts (see Table 2). Thus, if public and private contracts differ in their duration, so may investments; hence, contract duration can explain the more frequent use of words trying to define the transaction and the way to govern it, which leads to more rigid contracts. Consequently, contracts' publicness would not be the issue. To address this concern, in Model 2 we include contract duration as a regressor. Although the variable *Duration* is positively and significantly correlated with the level of contract rigidity, the impact of contracts' publicness still remains. In Model 3, we introduce another set of control variables about services managed through the contract and the common history of contractors. While the introduction of further control variables induces a slight decrease in significance, we observe that contracts' publicness still remains a driver of higher rigidity. As an additional robustness check, we also excluded concession contracts from our data. Since we counted only two private concession contracts (2% of the concession contracts sample), our results may be driven by the over-representation of public concession contracts. Thus, focusing on operating and provision of services contracts allows for a fairer comparison among different levels of contract rigidity. Results provided in Models 4–6 (which replicate Models 1–3 excluding concession contracts) are similar. Finally, models 7–12 in Table 6 presents the same regressions than Models 1–6 using our alternative measure of contract rigidity. All the results are similar.

Table 2: This table presents the count and frequency of public and private car parks contracts in our sample tabulated by duration in years.

Duration	Public Contracts			Private Contracts		
	N	%	Cumul. %	N	%	Cumul. %
0–2	67	19,2	19,2	16	34,0	34,0
2–4	50	14,3	33,5	12	25,5	59,6
4–10	66	18,9	52,4	16	34,0	93,6
10–20	44	12,6	65,0	2	4,3	97,9
20–30	67	19,2	84,2	1	2,1	100,0
30–65	55	15,8	100,0	0	0,0	100,0
Total	349	100,0		47	100,0	

Control variables provide interesting insights. Indeed, provision of services contracts are much less rigid than operating contracts. In contrast, we do not find significant differences between operating and concession contracts. We also found that contracts managing off-street car parks (*Underground*) and both on-street and off-street car parks (*Both_Services*) are more rigid than contracts for on-street car parks only. Finally, our variable *Trend* indicates that contracts tend to become more rigid over time. This may be an indication of a learning process and/or “red tape” inertia by public administrations, where subsequent arrangements replicate the rigidities of previous contracts and add new ones.

Rigidity by categories

Results provided in Table 7 focus on the different categories of contractual rigidity we defined previously. As indicated by our results, publicness of contracts is correlated with four over eight categories we defined. More precisely, public contracts are more rigid than private contracts in the following dimensions: Arbitrage, Penalties, Litigation, and Contingencies. Those results are consistent with what we observe from descriptive statistics in Figure 2 and in Table 3. Indeed, Welsh’ unequal variances t-test indicates that public and private contracts significantly differs in those four categories.

At the rigidity by categories level, control variables also provide interesting insights. Renewed contracts are less rigid than original contracts in two dimensions: litigation and contingencies, meaning that disputes resolving and anticipation of future events are less necessary when the contract is a renewal. The duration of the contract is also correlated with four of the eight categories, notably Termination. It suggest that contracts tend to incorporate more precisions about terms and condition for termination when partners commit in the long run. Finally, consistently with results concerning the total level of rigidity, results about categories suggest that contracts are less rigid for simplest contracts (*Provision_of_Services*) and more rigid over time (*Trend*).

4.2 Public Contract Rigidity and Political Contestability

We now turn to investigate how political contestability affects the rigidity of public contracts. Table 8 provides the results of estimations run in our public contracts sub-sample to explore the impact of the set of alternative political contestability measures defined in section 3.3.3. We restart from the fully specified model of Table 6 (Model 3) and we consecutively test our proxies of political contestability on contract rigidity. We also introduce two additional control variables here, namely the participation rate to the municipal elections preceding the contract signature (*Election_Participation*) and an index for the level of corruption at the department level (*Index_Corruption*). The first variable allows us to account for the sensitivity of the population to the municipal political life. The second variable, obtained

from Transparency International France,¹⁹ allows us to take into consideration the possible influence of a corrupted environment on public contracts. All our models specifications using political contestability variables suggest that political contestability affects public contract rigidity. According to Proposition 2, the more concentrated the political power in the municipality is, the less rigid the contract signed by the winning party will be, as illustrated by the positive and significant impact of our variable *HHI* in Model 1. Nevertheless, the Herfindahl-Hirschman index is limited, notably because it fails to take into account the number and concentration of non-winning lists. For that reason, we tested an alternative measure of political contestability in Model 2 where we took into account the total number of lists that were running in the election and the concentration of all non-winning lists. The significance of *Number_Of_Lists* and *Residual_HHI* indicates that contracts are more rigid when the political opposition is stronger.

It is important to note here that, theoretically, the number of lists has an ambiguous effect on contract rigidity. On one hand, the higher the number of lists is, the higher the scrutiny of public decisions will be; on the other, the higher the number of lists is, the more fractioned the political benefits from a successful contract protest will be. Our results suggest that the first effect is prevalent. Similarly, we found a significant relationship between the rigidity of public contracts and a relatively comfortable margin of victory (Model 3). Indeed, our variable *Win_Margin* and *Win_Margin*² suggest that contracts are more flexible when the political contestability is weak and become more rigid when the political contestability is high. Finally, coefficients associated with variables *Distance* and *Distance*² indicate that public contracts tend to be more rigid closer to election time. Thus, Models 1–4 lead to results consistent with Proposition 2. Results are almost identical when we use the alternative measure of total rigidity which takes contract size into account (*yRigidity*, Models 5–8).

There are many indicators of political contestability and the choice of one indicator over another is not easy. Nevertheless, our measures—which correspond to the most frequently used in the political economy literature²⁰—suggest that the political environment on various dimensions has an impact on public car park contracts’ rigidity in France.

4.3 Renegotiations of Public Contracts

Our set of results makes us confident about the specific nature of public contracts leading them to a higher level of rigidity than private contracts. Due to third-party opportunism that pushes for rigid contracts at their initial stage, the same political hazards should also make public contracts more prone to formal renegotiations: Since relational contracting is not an

¹⁹The index is built at the department level for year 2011 as the number of all the cases of corruption detected since 1990 normalized by the departmental GDP: $Index_Corruption = 10 \times \text{number of detected cases} / \text{departmental GDP}$.

²⁰See, e.g., Le Maux et al. [2011] for the use of Herfindal-Hirschman Index and Solé-Ollé [2006] for the use of win margin as measures of political competition and fragmentation.

option in public contracts, each renegotiation should redound to a formal amendment. We put our Proposition 3 to the test in Table 9. The first model presents our basic specification. Model 2 includes election participation and corruption index variables. Model 3 excludes concession contracts for the reason already discussed above. In all specifications, the positive and significant coefficient associated with the variable *Public* indicates that public contracts are more often formally renegotiated in amendments than private contracts.

Interestingly, Table 9 also suggests that contracts are less renegotiated when they correspond to renewed contracts (*Renewed*) and when they involve parties which have already contracted in the past (*Past_Contracts*). Overall, results corroborate our Proposition 3. A possible explanation is that public renegotiations must be translated into formal amendments, in contrast to private contracts which can rely on informal procedures.

5 Conclusions

In this paper, we investigated the specific nature of public versus private contracts. We compared procurement contracts where the procurer was either a public agent or a private corporation, and used algorithmic data reading and textual analysis on a dataset of car parks contracts to determine the level of contractual rigidity. We found that public contracts feature more rigidity clauses and that this rigidity rises in political contestability. We argue that a significant part of differences in contractual rigidity between purely private and public contracts is a political risk adaptation of the public agent to curb plausible challenges from political contesters and interest groups.

A natural consequence of public contract specificity is that such contracts are characterized by more frequent renegotiations and formal amendments. We found empirical evidences that public contracts are more frequently renegotiated than private contracts.

The depth of our research is limited in several ways. First, algorithmic textual analysis is still in its early stage and is not yet close to human interpretation, especially when it comes to legal nuances. The strong results we obtained even with imperfect methods, however, are indicative that our propositions are not spurious. We expect that the construction of better algorithms and “dictionaries” in the future will corroborate these findings. Second, corruption could be an important confounding factor. As discussed in section 2.2 and shown in Tables 8 and 9, corruption does not play a major role in our setting and, if present, would weaken (not strengthen) our results. Third, there might be omitted factors that correlate with both the characteristics of the contractor and of the municipality that determine the probability of winning a procurement contract, and which, therefore, determines the probability of being in our sample. In our opinion, a one-contractor sample provides the ideal experiment to test public versus private contractual heterogeneity. Moreover, the reputa-

tion of the contractor²¹ silences much of the potential sample conditionality. Fourth, private contract specifications may be embedded in ancillary documentation—e.g., scope of work or service level agreements—instead of master agreements. Should this be the case, the story of rigidity clauses as a signaling device of probity in the public sector would be reinforced; i.e., both public and private contracts are of the comparable rigidity nature, but public agents prefer to highlight those clauses in master agreements. Fifth, there are other factors which we are not able to control for and which could influence our results, foremost, different demand stochasticity (risk) in municipalities that could drive contract characteristics and pricing strategies that would correspond to demand risk. Unfortunately, we do not have data nor good variables to proxy demand stochasticity, neither car park prices at the municipal level across time. We assume that year and geographic fixed effects take care of part of this heterogeneity.

Adaptations of the presented model and empirical tests are extendable to quasi-political corporate governance settings. Whereas managers' discretion is subject to minority shareholders' or external stakeholders' scrutiny, they may take *ex ante* otherwise dispensable legal precautions to avoid *ex post* penalties and costs of litigation.

To our knowledge, this paper is the first (along with [Moszoro et al. \[2015\]](#)) to investigate the intrinsic properties of public contracts versus private contracts using data with measures of contract rigidity, frequency of amendment, and political contestability. It opens novel research avenues for exploration. One of these promising avenues involves investigating how the frequency of amendments in public contracts affects the quality of the contractual relationship and the willingness of the parties to continue and renew their relationship. What can be interpreted, at first glance, as a sign of weakness (i.e., frequent amendments) might well be good news indicating that the contracting parties can make the contract adaptable through time.

²¹The contractor is the largest car park provider in France.

Figure 2: This figure presents the mean score of word frequency obtained by public (grey) and private (white) contracts on each rigidity category.

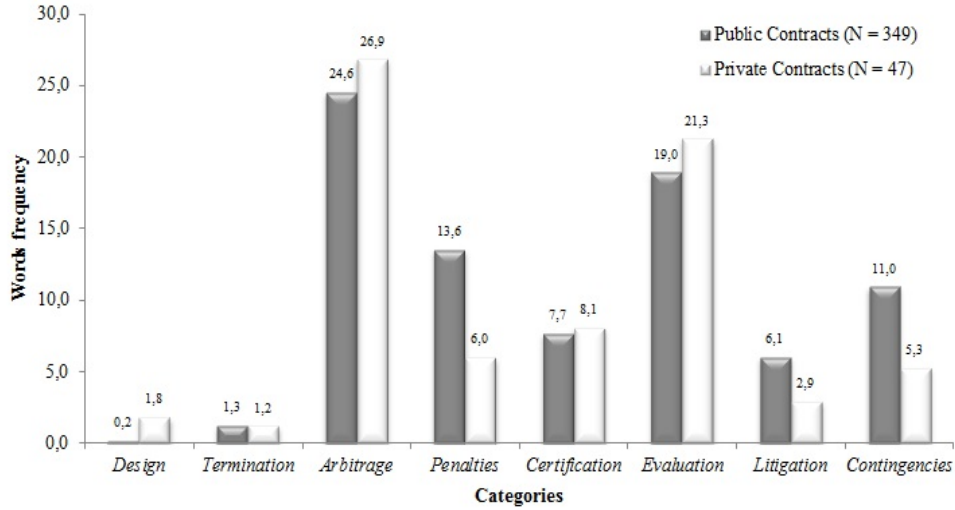


Table 3: This table presents summary statistics of rigidity categories in public and private contracts.

	Public Contracts					Private Contracts					T-test ^a
	<i>N</i>	μ	σ	min	max	<i>N</i>	μ	σ	min	max	
<i>Design</i>	349	0.19	0.49	0	3	47	0.55	1.84	0	9	1.352
<i>Termination</i>	349	1.28	1.54	0	8	47	1.02	1.22	0	5	-1.187
<i>Arbitrage</i>	349	24.56	14.25	0	98	47	16.83	26.86	2	137	-1.634
<i>Penalties</i>	349	13.57	8.56	0	68	47	5.96	6.02	0	27	-6.991
<i>Certification</i>	349	7.72	6.47	0	36	47	6.21	8.09	0	40	-0.573
<i>Evaluation</i>	349	18.96	11.10	0	76	47	14.36	21.30	0	110	-1.082
<i>Litigation</i>	349	6.05	3.65	0	22	47	3.09	2.95	0	13	-5.917
<i>Contingencies</i>	349	10.96	6.84	0	39	47	4.83	5.28	0	25	-7.841

^a As public and private contracts' samples have unequal variances and unequal sizes, we report here the "Welch's unequal variances t-test".

Table 4: This table present descriptive statistics of our contract and political variables and controls, broken down by type of contract.

	All sample					Operating Contracts				
	N	μ	σ	min	max	N	μ	σ	min	max
<i>Public</i>	396	0.88	0.32	0.00	1.00	160	0.82	0.39	0.00	1.00
<i>zRigidity</i>	396	2.21	16.31	-27.64	80.22	160	6.45	18.11	-23.51	80.22
<i>zDesign</i>	396	0.04	1.52	-0.50	13.55	160	0.34	2.05	-0.50	13.55
<i>zTermination</i>	396	0.08	3.43	-2.40	24.02	160	0.65	3.59	-2.40	14.46
<i>zArbitrage</i>	396	0.50	3.61	-4.77	21.13	160	0.90	4.14	-4.43	21.13
<i>zPenalties</i>	396	0.43	3.61	-4.75	20.60	160	1.33	3.70	-4.75	20.60
<i>zCertification</i>	396	0.34	3.21	-3.00	18.25	160	0.73	3.42	-3.00	15.79
<i>zEvaluation</i>	396	0.50	4.24	-5.61	24.11	160	1.40	4.62	-5.39	24.11
<i>zLitigation</i>	396	0.28	3.55	-4.63	19.36	160	0.86	3.43	-4.63	11.89
<i>zContingencies</i>	396	0.04	2.76	-2.45	17.64	160	0.21	3.39	-2.45	17.64
<i>yTotRigid</i>	396	2.22	17.18	-27.24	87.73	160	6.54	19.29	-23.35	87.73
<i>Renewed</i>	396	0.16	0.37	0.00	1.00	160	0.12	0.32	0.00	1.00
<i>Inhabitants</i>	396	10.83	1.59	8.09	14.08	160	10.80	1.40	8.25	14.08
<i>Left_Wing</i>	396	0.15	0.35	0.00	1.00	160	0.16	0.37	0.00	1.00
<i>Right_Wing</i>	396	0.28	0.45	0.00	1.00	160	0.33	0.47	0.00	1.00
<i>Trend</i>	396	2 000.41	7.41	1 985.00	2 009.00	160	1 999.59	7.36	1 985.00	2 009.00
<i>Duration</i>	396	15.00	15.12	1.00	65.00	160	16.61	14.67	1.00	65.00
<i>Places</i>	393	1 694.08	12 296.67	9.00	241 600.00	160	1 330.76	2 763.12	83.00	23 481.00
<i>Experience</i>	396	9.85	12.33	0.00	46.00	160	8.06	11.70	0.00	42.00
<i>Past_Contracts</i>	396	5.46	13.07	0.00	68.00	160	3.33	10.55	0.00	65.00
<i>Average_Amendments</i>	396	0.19	0.33	0.00	2.00	160	0.18	0.29	0.00	1.71
<i>Election_Participation</i>	329	0.59	0.08	0.35	0.90	136	0.59	0.09	0.44	0.90
<i>Index_Corruption</i>	329	2.04	1.39	0.00	14.41	136	1.93	1.16	0.00	9.75
<i>HHI</i>	329	0.37	0.12	0.21	1.00	136	0.37	0.11	0.21	0.67
<i>Residual_HHI</i>	329	0.46	0.09	0.00	0.67	136	0.47	0.08	0.34	0.66
<i>Number_of_Lists</i>	329	5.13	2.59	1.00	12.00	136	5.03	2.43	2.00	12.00
<i>Win_Margin</i>	329	21.09	16.69	0.15	100.00	136	20.38	15.20	0.31	63.44
<i>Distance</i>	329	2.57	1.78	0.00	6.00	136	2.63	1.85	0.00	6.00
	Provision of Services Contracts					Concession Contracts				
	N	μ	σ	min	max	N	μ	σ	min	max
<i>Public</i>	146	0.88	0.32	0.00	1.00	90	0.99	0.11	0.00	1.00
<i>zRigidity</i>	146	-3.70	14.33	-27.64	42.91	90	4.24	12.89	-27.35	41.51
<i>zDesign</i>	146	-0.19	0.89	-0.50	5.37	90	-0.11	1.11	-0.50	4.83
<i>zTermination</i>	146	-0.63	2.91	-2.40	13.50	90	0.20	3.74	-2.40	24.02
<i>zArbitrage</i>	146	0.05	3.47	-4.77	17.26	90	0.52	2.63	-4.48	10.80
<i>zPenalties</i>	146	-1.53	2.70	-4.75	8.39	90	2.03	3.35	-4.75	8.14
<i>zCertification</i>	146	-0.23	3.41	-3.00	18.25	90	0.56	2.23	-3.00	6.10
<i>zEvaluation</i>	146	-0.04	4.09	-5.61	22.34	90	-0.21	3.45	-5.61	11.90
<i>zLitigation</i>	146	-0.68	3.71	-4.63	19.36	90	0.82	3.20	-4.63	17.03
<i>zContingencies</i>	146	-0.58	2.00	-2.45	10.55	90	0.72	2.40	-2.45	10.41
<i>yTotRigid</i>	146	-3.93	14.96	-27.24	47.10	90	4.52	13.41	-27.08	43.36
<i>Renewed</i>	146	0.28	0.45	0.00	1.00	90	0.03	0.18	0.00	1.00
<i>Inhabitants</i>	146	10.16	1.26	8.09	14.00	90	11.96	1.74	9.12	14.08
<i>Left_Wing</i>	146	0.04	0.20	0.00	1.00	90	0.29	0.46	0.00	1.00
<i>Right_Wing</i>	146	0.36	0.48	0.00	1.00	90	0.09	0.29	0.00	1.00
<i>Trend</i>	146	2 005.36	3.20	1 986.00	2 009.00	90	1 993.83	6.73	1 985.00	2 009.00
<i>Duration</i>	146	3.59	4.81	1.00	40.00	90	30.67	11.25	2.00	65.00
<i>Places</i>	143	2 635.87	20 173.73	9.00	241 600.00	90	843.58	789.64	30.00	4 330.00
<i>Experience</i>	146	8.62	11.02	0.00	43.00	90	15.03	14.02	0.00	46.00
<i>Past_Contracts</i>	146	2.47	7.02	0.00	68.00	90	14.12	19.51	0.00	62.00
<i>Average_Amendments</i>	146	0.24	0.41	0.00	2.00	90	0.12	0.20	0.00	1.40
<i>Election_Participation</i>	139	0.56	0.06	0.35	0.78	54	0.63	0.08	0.47	0.80
<i>Index_Corruption</i>	139	1.84	1.05	0.00	5.40	54	2.57	2.01	0.00	14.41
<i>HHI</i>	139	0.39	0.14	0.22	1.00	54	0.34	0.10	0.22	0.62
<i>Residual_HHI</i>	139	0.45	0.11	0.00	0.67	54	0.49	0.07	0.35	0.62
<i>Number_of_Lists</i>	139	4.49	2.20	1.00	12.00	54	6.36	3.05	2.00	12.00
<i>WinMargin</i>	139	22.61	19.39	0.15	100.00	54	18.98	12.04	0.31	49.80
<i>Distance</i>	139	2.53	1.87	0.00	6.00	54	2.54	1.49	0.00	6.00

Table 5: This table presents pairwise correlations of our contract and political variables and controls.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. <i>Public</i>	1													
2. <i>zRigidity</i>	0,093	1												
3. <i>zDesign</i>	-0,179	0,431	1											
4. <i>zTermination</i>	-0,004	0,476	0,200	1										
5. <i>zArbitrage</i>	0,057	0,687	0,224	0,179	1									
6. <i>zPenalties</i>	0,226	0,653	0,094	0,240	0,324	1								
7. <i>zCertification</i>	0,011	0,727	0,351	0,312	0,497	0,320	1							
8. <i>zEvaluation</i>	-0,012	0,804	0,435	0,280	0,471	0,450	0,509	1						
9. <i>zLitigation</i>	0,146	0,665	0,193	0,149	0,334	0,394	0,421	0,444	1					
10. <i>zContingencies</i>	0,117	0,532	0,064	0,098	0,315	0,302	0,269	0,367	0,305	1				
11. <i>yRigidity</i>	0,095	0,998	0,436	0,469	0,688	0,644	0,733	0,803	0,659	0,537	1			
12. <i>Renewed</i>	0,033	-0,061	0,002	-0,047	0,034	-0,138	0,058	0,023	-0,121	-0,134	-0,061	1		
13. <i>Inhabitants</i>	-0,123	0,092	-0,022	0,092	0,005	0,120	0,059	0,074	0,113	-0,002	0,085	-0,174	1	
14. <i>Left_Wing</i>	0,025	0,014	-0,024	0,048	-0,052	0,172	-0,005	-0,103	0,045	0,032	0,012	-0,120	0,245	1
15. <i>Right_Wing</i>	-0,043	0,093	0,076	0,097	0,102	-0,034	0,131	0,105	0,006	-0,026	0,088	0,063	-0,079	-0,216
16. <i>Trend</i>	-0,121	0,001	0,149	0,056	0,119	-0,272	0,039	0,180	-0,117	-0,135	0,003	0,377	-0,281	-0,360
17. <i>Duration</i>	0,194	0,174	-0,052	0,129	-0,006	0,412	0,117	-0,069	0,186	0,159	0,171	-0,293	0,279	0,344
18. <i>Places</i>	-0,021	0,195	-0,013	0,068	0,032	0,047	0,114	0,233	0,087	0,414	0,195	-0,058	0,039	-0,029
19. <i>Experience</i>	0,164	0,060	0,045	0,094	0,053	-0,034	0,045	0,087	0,080	-0,088	0,050	0,193	0,357	-0,059
20. <i>PastContracts</i>	0,142	0,003	0,015	0,072	0,061	-0,113	-0,026	0,023	0,064	-0,079	-0,001	0,303	0,307	-0,089
21. <i>Average_Amendments</i>	0,035	-0,044	-0,054	-0,054	-0,048	0,020	-0,060	-0,058	0,002	0,007	-0,045	-0,202	0,048	0,032
22. <i>Election_Participation</i>	0,203	0,017	-0,142	-0,081	-0,066	0,202	-0,019	-0,103	0,071	0,177	0,019	-0,107	-0,114	0,232
23. <i>Index_Corruption</i>	0,074	0,077	-0,011	-0,037	0,013	0,201	0,037	-0,024	0,087	0,100	0,078	-0,047	-0,054	-0,113
24. <i>HHI</i>	0,136	-0,068	-0,002	-0,077	-0,059	-0,047	-0,049	-0,071	-0,081	0,082	-0,059	0,037	-0,381	-0,064
25. <i>Residual_HHI</i>	0,112	0,051	0,093	-0,014	-0,014	0,075	0,041	-0,039	0,053	0,116	0,054	0,057	-0,204	0,107
26. <i>Number_of_Lists</i>	-0,162	0,070	-0,016	0,088	0,034	0,048	0,042	0,118	0,056	-0,064	0,061	-0,066	0,576	0,104
27. <i>Win_Margin</i>	0,048	-0,001	-0,042	-0,022	0,035	-0,057	-0,014	0,040	-0,019	0,061	0,004	0,021	-0,196	-0,167
28. <i>Distance</i>	-0,074	-0,073	-0,045	-0,031	-0,071	-0,084	0,001	-0,097	-0,024	0,002	-0,076	-0,092	0,010	-0,050

	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.
15. <i>Right_Wing</i>	1													
16. <i>Trend</i>	0,425	1												
17. <i>Duration</i>	-0,249	-0,694	1											
18. <i>Places</i>	0,119	0,066	-0,068	1										
19. <i>Experience</i>	0,184	0,235	-0,132	-0,029	1									
20. <i>Past_Contracts</i>	0,107	0,312	-0,200	-0,004	0,764	1								
21. <i>Average_Amendments</i>	-0,075	-0,175	-0,125	0,002	-0,068	-0,142	1							
22. <i>Election_Participation</i>	-0,183	-0,608	0,393	-0,055	-0,242	-0,271	0,109	1						
23. <i>Index_Corruption</i>	-0,117	-0,102	0,090	-0,025	-0,066	-0,087	0,007	0,187	1					
24. <i>HHI</i>	0,053	-0,057	-0,021	0,044	-0,142	-0,134	0,033	0,231	0,119	1				
25. <i>Residual_HHI</i>	-0,016	-0,221	0,112	-0,004	-0,139	-0,129	-0,025	0,437	0,122	0,249	1			
26. <i>Number_of_Lists</i>	-0,031	0,066	0,026	0,013	0,272	0,214	0,007	-0,325	-0,161	-0,757	-0,544	1		
27. <i>Win_Margin</i>	0,132	0,118	-0,108	0,100	0,052	0,054	0,039	-0,108	-0,002	0,661	-0,336	-0,338	1	
28. <i>Distance</i>	-0,080	-0,188	0,039	0,035	-0,026	-0,076	0,124	0,038	-0,121	0,004	0,057	0,029	-0,067	1

Table 6: This table presents results from panel OLS regressions of two measures of global rigidity ($zRigidity$ and $yRigidity$) on contract characteristics and controls described in Table 4. Clustered standard errors (at the department level) are in parentheses. Levels of significance: + 15%, * 10%, ** 5% and *** 1%.

Dependent variable	$zRigidity$			$yRigidity$								
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
<i>Public</i>	10.878*** (4.049)	9.581** (4.056)	9.366* (5.271)	11.610*** (4.339)	10.245** (4.174)	9.383* (5.340)	11.723** (4.444)	10.362** (4.424)	10.193* (5.718)	12.424** (4.768)	11.013** (4.563)	10.152* (5.791)
<i>Renewed</i>	-2.946 (2.127)	-2.819 (2.138)	-2.727 (2.021)	-3.079 (2.421)	-2.892 (2.387)	-2.731 (2.194)	-3.217 (2.284)	-3.084 (2.298)	-2.921 (2.129)	-3.184 (2.556)	-2.991 (2.519)	-2.782 (2.295)
<i>Provision_of_Services</i>	-13.391*** (2.960)	-11.997*** (3.150)	-10.490*** (3.578)	-13.312*** (3.374)	-11.907*** (3.613)	-10.351** (4.105)	-13.944*** (3.185)	-12.481*** (3.388)	-10.802*** (3.821)	-13.885*** (3.626)	-12.432*** (3.882)	-10.714** (4.391)
<i>Concession</i>	-0.917 (1.999)	-2.241 (1.981)	-1.179 (1.760)	-	-	-	-0.672 (2.180)	-2.060 (2.177)	-0.962 (1.934)	-	-	-
<i>Inhabitants</i>	0.158 (0.664)	0.164 (0.656)	0.319 (1.297)	0.697 (0.954)	0.704 (0.949)	0.579 (1.444)	0.127 (0.697)	0.133 (0.692)	0.280 (1.376)	0.648 (1.022)	0.655 (1.017)	0.497 (1.558)
<i>Left_Wing</i>	-0.235 (1.934)	-1.172 (1.858)	0.089 (1.883)	1.038 (3.218)	-0.230 (2.926)	0.841 (2.829)	-0.301 (1.976)	-1.284 (1.914)	0.018 (1.907)	1.015 (3.385)	-0.296 (3.102)	0.938 (2.965)
<i>Right_Wing</i>	2.293 (2.007)	2.117 (1.981)	0.789 (2.118)	2.574 (2.162)	2.484 (2.141)	1.201 (2.284)	2.133 (2.113)	1.949 (2.084)	0.583 (2.243)	2.545 (2.246)	2.451 (2.222)	1.120 (2.385)
<i>Trend</i>	0.523*** (0.159)	0.684*** (0.163)	0.685*** (0.165)	0.590** (0.243)	0.765*** (0.251)	0.744*** (0.256)	0.558*** (0.172)	0.727*** (0.174)	0.728*** (0.177)	0.623** (0.263)	0.804*** (0.270)	0.786*** (0.274)
<i>Duration</i>	-	0.181** (0.086)	0.180** (0.081)	-	0.193** (0.094)	0.200** (0.093)	-	0.190** (0.089)	0.188** (0.084)	-	0.199** (0.099)	0.206** (0.096)
<i>Places</i>	-	-	0.001*** (0.000)	-	-	0.001*** (0.000)	-	-	0.001*** (0.000)	-	-	0.001*** (0.000)
<i>Places²</i>	-	-	-0.000*** (0.000)	-	-0.000*** (0.000)	-	-	-	-0.000*** (0.000)	-	-	-0.000*** (0.000)
<i>Underground</i>	-	-	(0.000)	-	(0.000)	(0.000)	-	-	(0.000)	-	-	(0.000)
	-	-	3.050+	-	-	2.827	-	-	3.537+	-	-	3.309+
	-	-	(2.038)	-	-	(2.138)	-	-	(2.119)	-	-	(2.237)
<i>Both_Services</i>	-	-	5.238* (2.863)	-	-	5.300* (3.143)	-	-	6.036* (3.030)	-	-	6.111* (3.328)
<i>Experience</i>	-	-	0.065 (0.137)	-	-	0.072 (0.155)	-	-	0.052 (0.143)	-	-	0.062 (0.162)
<i>Post_Contracts</i>	-	-	-0.135+ (0.092)	-	-	-0.141 (0.100)	-	-	-0.125 (0.096)	-	-	-0.132 (0.106)
<i>N</i>	396	396	393	306	306	303	396	396	393	306	306	303
<i>r²</i>	0.160	0.170	0.224	0.174	0.184	0.242	0.159	0.169	0.226	0.171	0.180	0.242

Table 7: This table presents results from panel OLS regressions of rigidity by categories (z and y categories) on contract characteristics and controls described in Table 4. Clustered standard errors (at the department level) are in parentheses. Levels of significance: + 15%, * 10%, ** 5% and *** 1%.

Dependent variables	$zDesign$	$zTermination$	$zArbitration$	$zPenalties$	$zCertification$	$zEvaluation$	$zLitigation$	$zContingencies$
Public	-0.851 (0.679)	0.429 (0.845)	2.096* (1.102)	2.850*** (0.732)	0.140 (0.808)	1.781 (1.419)	2.236*** (0.681)	0.758 (0.542)
<i>Renewed</i>	-0.187 (0.172)	-0.535 (0.460)	-0.318 (0.422)	-0.406 (0.373)	0.499 (0.530)	-0.456 (0.491)	-0.849+ (0.543)	-0.413+ (0.248)
<i>Provision_of_Services</i>	-0.882** (0.374)	-1.311** (0.516)	-1.347** (0.655)	-2.335*** (0.404)	-1.235+ (0.828)	-2.096** (0.813)	-0.943* (0.541)	-0.231 (0.366)
<i>Concession</i>	0.031 (0.221)	-0.434 (0.598)	-0.075 (0.362)	-0.115 (0.533)	0.403 (0.439)	-0.686 (0.532)	-0.628 (0.543)	0.363 (0.462)
<i>Inhabitants</i>	-0.136 (0.133)	0.074 (0.183)	-0.010 (0.266)	-0.079 (0.159)	0.101 (0.232)	0.246 (0.485)	0.146 (0.249)	0.045 (0.152)
<i>Left_Wing</i>	-0.086 (0.255)	-0.387 (0.843)	-0.008 (0.375)	1.056** (0.483)	-0.347 (0.363)	-0.392 (0.695)	-0.207 (0.512)	0.436 (0.527)
<i>Right_Wing</i>	0.029 (0.277)	0.448 (0.552)	0.206 (0.483)	0.096 (0.418)	0.669* (0.395)	-0.115 (0.721)	-0.097 (0.463)	-0.442 (0.343)
<i>Trend</i>	0.041* (0.024)	0.090* (0.053)	0.133*** (0.033)	0.050 (0.037)	0.104*** (0.032)	0.204*** (0.045)	0.048 (0.050)	0.003 (0.030)
<i>Places</i>	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)
<i>Places</i> ²	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000+ (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000** (0.000)	-0.000*** (0.000)
<i>Underground</i>	-0.355** (0.162)	-0.537+ (0.346)	1.135** (0.460)	0.602 (0.425)	-0.074 (0.473)	0.641 (0.452)	0.964** (0.452)	0.713** (0.311)
<i>Both_Services</i>	-0.301+ (0.206)	-0.302 (0.607)	1.175* (0.657)	1.086* (0.543)	0.237 (0.609)	0.898 (0.761)	1.181* (0.595)	1.230** (0.467)
<i>Experience</i>	0.015* (0.009)	0.037+ (0.024)	-0.003 (0.029)	-0.002 (0.030)	0.003 (0.018)	0.005 (0.038)	0.022 (0.026)	-0.011 (0.016)
<i>Past_Contracts</i>	-0.006 (0.007)	-0.028+ (0.017)	-0.002 (0.018)	-0.002 (0.019)	-0.025 (0.019)	-0.050+ (0.033)	-0.039* (0.022)	0.016 (0.019)
<i>Duration</i>	0.005 (0.008)	0.044* (0.024)	0.004 (0.017)	0.043** (0.021)	0.036+ (0.022)	0.022 (0.031)	0.036 (0.026)	-0.003 (0.021)
<i>N</i>	393	393	393	393	393	393	393	393
<i>r</i> ²	0.099	0.081	0.116	0.290	0.103	0.220	0.131	0.211

Dependent variables	$yDesign$	$yTermination$	$yArbitration$	$yPenalties$	$yCertification$	$yEvaluation$	$yLitigation$	$yContingencies$
Public	-0.827 (0.701)	0.503 (0.855)	2.224* (1.152)	2.954*** (0.753)	0.199 (0.876)	1.980 (1.537)	2.360*** (0.735)	0.881+ (0.536)
<i>Renewed</i>	-0.186 (0.172)	-0.534 (0.468)	-0.343 (0.436)	-0.446 (0.369)	0.447 (0.537)	-0.472 (0.502)	-0.889+ (0.554)	-0.435* (0.256)
<i>Provision_of_Services</i>	-0.898** (0.389)	-1.338** (0.523)	-1.415** (0.688)	-2.359*** (0.424)	-1.298+ (0.850)	-2.122** (0.864)	-0.988* (0.564)	-0.271 (0.381)
<i>Concession</i>	0.031 (0.226)	-0.421 (0.596)	-0.085 (0.376)	-0.063 (0.554)	0.419 (0.448)	-0.646 (0.529)	-0.566 (0.555)	0.399 (0.465)
<i>Inhabitants</i>	-0.140 (0.139)	0.073 (0.187)	0.009 (0.280)	-0.081 (0.160)	0.073 (0.245)	0.228 (0.492)	0.148 (0.261)	0.040 (0.148)
<i>Left_Wing</i>	-0.075 (0.261)	-0.398 (0.842)	-0.039 (0.374)	1.024** (0.483)	-0.349 (0.356)	-0.384 (0.697)	-0.249 (0.515)	0.450 (0.516)
<i>Right_Wing</i>	0.043 (0.278)	0.418 (0.554)	0.197 (0.473)	0.045 (0.418)	0.640+ (0.404)	-0.151 (0.739)	-0.148 (0.466)	-0.454 (0.353)
<i>Trend</i>	0.042* (0.025)	0.095* (0.054)	0.139*** (0.034)	0.057+ (0.038)	0.109*** (0.032)	0.209*** (0.047)	0.056 (0.051)	0.011 (0.031)
<i>Places</i>	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.001*** (0.000)
<i>Places</i> ²	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000** (0.000)	-0.000 (0.000)	-0.000*** (0.000)	-0.000** (0.000)	-0.000*** (0.000)
<i>Underground</i>	-0.300* (0.158)	-0.505+ (0.344)	1.191** (0.472)	0.669+ (0.424)	-0.023 (0.477)	0.777* (0.456)	1.029** (0.457)	0.736** (0.306)
<i>Both_Services</i>	-0.250 (0.208)	-0.286 (0.609)	1.323* (0.679)	1.243** (0.569)	0.298 (0.622)	1.053 (0.777)	1.315** (0.609)	1.305*** (0.473)
<i>Experience</i>	0.016* (0.009)	0.036+ (0.024)	-0.005 (0.030)	-0.003 (0.031)	0.001 (0.018)	0.001 (0.038)	0.021 (0.026)	-0.014 (0.016)
<i>Past_Contracts</i>	-0.007 (0.008)	-0.026+ (0.017)	-0.001 (0.019)	0.003 (0.019)	-0.022 (0.019)	-0.047 (0.033)	-0.039* (0.022)	0.016 (0.019)
<i>Duration</i>	0.005 (0.008)	0.046* (0.024)	0.006 (0.018)	0.044** (0.020)	0.037* (0.022)	0.023 (0.031)	0.037 (0.027)	-0.003 (0.020)
<i>N</i>	393	393	393	393	393	393	393	393
<i>r</i> ²	0.098	0.083	0.123	0.294	0.104	0.222	0.139	0.213

Table 8: This table presents results from panel OLS regressions of two measures of global rigidity ($zRigidity$ and $yRigidity$) on contract characteristics, political contestability variables, and controls described in Table 4 for the subsample of public contracts. Clustered standard errors (at the department level) are in parentheses. Levels of significance: + 15%, * 10%, ** 5% and *** 1%.

Dependent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	<i>zRigidity</i>				<i>yRigidity</i>			
<i>Renewed</i>	-2.340 (2.717)	-2.753 (2.726)	-2.821 (2.736)	-2.857 (2.795)	-2.601 (2.871)	-3.031 (2.873)	-3.085 (2.883)	-3.166 (2.923)
<i>Provision_of_Services</i>	-10.697*** (2.928)	-10.663*** (2.932)	-10.494*** (2.971)	-10.641*** (2.924)	-11.031*** (3.070)	-10.979*** (3.070)	-10.819*** (3.111)	-10.912*** (3.047)
<i>Concession</i>	-1.597 (2.143)	-1.719 (2.122)	-2.080 (2.116)	-1.889 (2.084)	-1.491 (2.304)	-1.622 (2.281)	-1.974 (2.270)	-1.775 (2.231)
<i>Inhabitants</i>	0.413 (1.337)	-0.249 (1.514)	0.981 (1.307)	1.392 (1.381)	0.400 (1.363)	-0.271 (1.554)	0.961 (1.335)	1.373 (1.408)
<i>Left_Wing</i>	0.156 (3.015)	-0.523 (2.962)	0.661 (3.119)	0.207 (2.906)	0.102 (3.059)	-0.603 (3.023)	0.625 (3.188)	0.150 (2.938)
<i>Right_Wing</i>	0.663 (2.374)	0.418 (2.454)	-0.458 (2.358)	0.403 (2.466)	0.402 (2.511)	0.153 (2.580)	-0.727 (2.496)	0.185 (2.608)
<i>Trend</i>	0.698*** (0.212)	0.705*** (0.220)	0.790*** (0.211)	0.692*** (0.222)	0.746*** (0.227)	0.753*** (0.232)	0.838*** (0.225)	0.726*** (0.233)
<i>Duration</i>	0.146+ (0.089)	0.147+ (0.092)	0.156* (0.087)	0.154* (0.085)	0.149+ (0.092)	0.151+ (0.095)	0.159* (0.090)	0.157* (0.089)
<i>Places</i>	0.002** (0.001)	0.002** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.003*** (0.001)
<i>Places²</i>	-0.000 (0.000)	-0.000 (0.000)	-0.000* (0.000)	-0.000* (0.000)	-0.000* (0.000)	-0.000* (0.000)	-0.000** (0.000)	-0.000** (0.000)
<i>Underground</i>	3.160 (2.779)	3.714 (2.744)	3.349 (2.663)	3.373 (2.785)	3.666 (2.873)	4.234+ (2.831)	3.849 (2.759)	3.870 (2.867)
<i>Both_Services</i>	6.369** (2.869)	6.609** (2.853)	6.439** (2.888)	5.967** (2.907)	7.189** (3.001)	7.452** (2.981)	7.259** (3.027)	6.785** (3.026)
<i>Experience</i>	0.076 (0.167)	0.051 (0.164)	0.094 (0.174)	0.095 (0.170)	0.055 (0.176)	0.030 (0.172)	0.073 (0.182)	0.077 (0.178)
<i>Past_Contracts</i>	-0.466 (0.891)	-0.374 (0.876)	-0.662 (0.858)	-0.756 (0.870)	-0.407 (0.944)	-0.314 (0.928)	-0.605 (0.909)	-0.722 (0.928)
<i>Election_Participation</i>	14.975 (16.727)	11.360 (15.403)	12.245 (15.879)	10.516 (17.815)	16.335 (17.737)	12.469 (16.327)	13.658 (16.706)	11.437 (18.596)
<i>Index_Corrupt</i>	0.584 (0.628)	0.613 (0.625)	0.503 (0.617)	0.484 (0.633)	0.604 (0.652)	0.634 (0.649)	0.525 (0.635)	0.505 (0.654)
Political Contestability Variables								
<i>HHI</i>	-17.768** (6.819)	-	-	-	-17.557** (6.988)	-	-	-
<i>Residual_HHI</i>	-	16.564* (8.552)	-	-	-	17.377* (9.014)	-	-
<i>Number_of_Lists</i>	-	1.889*** (0.619)	-	-	-	1.904*** (0.624)	-	-
<i>Win_Margin</i>	-	-	0.220* (0.121)	-	-	-	0.226* (0.127)	-
<i>Win_Margin</i>	-	-	-0.004*** (0.001)	-	-	-	-0.004*** (0.001)	-
<i>Distance</i>	-	-	-	-2.592* (1.329)	-	-	-	-2.911** (1.372)
<i>Distance²</i>	-	-	-	0.394* (0.214)	-	-	-	0.441* (0.221)
<i>N</i>	297	297	297	297	297	297	297	297
<i>r²</i>	0.269	0.270	0.274	0.261	0.270	0.272	0.275	0.265

Table 9: This table presents results from panel OLS regressions of average number of amendments (*Average_Amendments*) on contract characteristics and controls described in Table 4. Clustered standard errors (at the department level) are in parentheses. Levels of significance: + 15%, * 10%, ** 5% and *** 1%.

Dependent variable	Model 1	Model 2	Model 3
	<i>Average_Amendments</i>		
<i>Public</i>	0.117* (0.061)	0.127* (0.065)	0.151** (0.065)
<i>Renewed</i>	-0.161*** (0.045)	-0.131*** (0.046)	-0.127** (0.053)
<i>Provision_of_Services</i>	0.045 (0.040)	0.058+ (0.040)	0.063+ (0.038)
<i>Concession</i>	-0.020 (0.038)	-0.016 (0.056)	- -
<i>Inhabitants</i>	0.012 (0.020)	0.046* (0.024)	0.059** (0.028)
<i>Left_Wing</i>	-0.008 (0.030)	0.003 (0.054)	0.011 (0.080)
<i>Right_Wing</i>	0.021 (0.050)	0.005 (0.050)	0.005 (0.055)
<i>Duration</i>	-0.010*** (0.002)	-0.011*** (0.002)	-0.013*** (0.003)
<i>Places</i>	-0.000 (0.000)	0.000 (0.000)	0.000+ (0.000)
<i>Places²</i>	0.000 (0.000)	-0.000* (0.000)	-0.000** (0.000)
<i>Underground</i>	-0.053 (0.050)	-0.023 (0.050)	-0.006 (0.056)
<i>Both_Services</i>	0.007 (0.050)	0.019 (0.055)	0.012 (0.060)
<i>Experience</i>	-0.001 (0.002)	0.002 (0.003)	0.001 (0.003)
<i>Past_Contracts</i>	-0.004* (0.002)	-0.034** (0.014)	-0.034** (0.014)
<i>Election_Participation</i>	- -	0.117 (0.360)	0.162 (0.428)
<i>Index_Corrupt</i>	- -	0.000 (0.013)	-0.001 (0.020)
<i>Trend</i>	-0.019*** (0.004)	-0.019*** (0.004)	-0.022*** (0.005)
<i>N</i>	393	326	272
<i>r²</i>	0.203	0.210	0.218

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