

Political Contestability and Public Contract Rigidity*

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Abstract

Are public contracts less adaptable than private contracts? Using a comprehensive set of contracts for a standard product, we compare procurement contracts in which the procurer is either a public administration or a private corporation. We find that public-to-private contracts feature more rigidity clauses than private-to-private contracts, and that the use of rigidity clauses in public contracts rises when political risks are more salient. We argue that a significant part of the increased rigidity of public contracts is a contractual adaptation to limit political hazards from political opponents and interested third parties.

Keywords: Procurement, Political Contestability, Contractual Rigidity

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1 Introduction

Understanding public contracting is of utmost relevance for economists and policymakers: public procurement accounts for approximately 10% of GDP in the US and 13% of GDP in OECD member countries.¹ Public contracting is the government activity most vulnerable to waste and corruption, and its efficiency is a substantial component of voters' political choices.

Prior studies have largely assessed the efficiency of public contracting by focusing on the proper scope of governments and whether contracting public services to the private sector is more efficient than direct public management. Despite several explanations attributing transaction-costs to the inefficiency of public contracting [Brown and Potoski, 2003], further explanations for such inefficiencies have remained obscure.² Little has been done, however, to examine the juxtaposition between the intrinsic natures of public-sector and private-sector contracting. The prevailing view is that private-sector contracts encapsulate most contractual complexities (general case), while public-sector contracts present special cases of issues rooted in social equity, corruption, and “red tape.” That is, public-sector and private-sector contracts have been studied extensively in their own separate domains, but there exists no overarching theory that explains the idiosyncrasies of public vis-à-vis private contracts. This gap is due, in part, to the difficulty in comparing contractual objects across public and private spheres.

A fundamental feature of public contracts is that they are subject to public oversight because they deal with public monies [Spiller, 2008]. As argued by Moszoro and Spiller [2012], public contracts are characterized by intrinsic differences stemming from a substantial amount of supervision and control by political opponents and interest groups, who hold a stake in challenging and disrupting a contractual relationship. Consequently, unlike private contracting, a grasp on politics becomes vital in understanding public contracting.

¹Cf. <http://www.oecd.org/gov/ethics/public-procurement.htm>. In the EU, the public purchase of goods and services has been estimated to account for 16% of GDP; <http://ec.europa.eu/trade/policy/accessing-markets/public-procurement/>.

²See Bel et al. [2010] for a survey of all econometric studies examining the privatization of public services.

By the same token, public contracting is attributed by a set of rule-based (bureaucratic) procedures. This “contract rigidity” refers to the addition of contractual specifications that impose *ex post* stringent enforcement, intolerance to adaptation, and penalties for deviation.³ From the public administration perspective, contractual rigidity minimizes the risk of politically motivated challenges [Moszoro and Spiller, 2012]. While from the contractor’s perspective, contractual rigidity minimizes the risk of governmental opportunism [Moszoro and Spiller, 2014], to include unfair administrative treatment and creeping expropriation.

Moreover, when faced with unexpected circumstances, private contractees tend to adapt *ad hoc*, while formalized amendments are often found in public contracts. The rigidity of public contracts triggered by third-party opportunism also induces their renegotiation through written amendments.

Building on the aforementioned characteristics of public contracting, two testable propositions can be derived. First, public contracts are more rigid than equivalent transactions governed under private contracting. Second, public authorities subject to political competition increase the *proceduralization* of contractual agreements to insulate themselves from politically motivated challenges.

To test these propositions, we collected a unique set of contracts concerning parking lot agreements signed between 1985 and 2009 in France. We analyzed 1,189 contractual arrangements signed between a private operator and 24 private procurers (which we call “private contracts”), and between the same private operator and 152 public authorities (which we call “public contracts”). We also collected data on local elections and computed several measures of political contestability.

Analogous to Schwartz and Watson [2012], we parsed through this rich sample of contracts using textual analysis. We find that public contracts feature more rigidity clauses and that their renegotiation is formalized through amendments. We further compare the sub-sample

³In this regard, contract rigidity is the opposite of “best efforts” or “reasonable adaptation” clauses.

of public contracts and find that the frequency of rigidity clauses rises when political competition is tight. We argue that a significant part of the differences in contractual rigidity among private and public contracts is a political risk adaptation to mitigate challenges from political contesters and interest groups. Complementarily, where firms anticipate a politically unstable environment that may lead to creeping expropriation, they will require rigid terms to minimize governmental opportunism.⁴ We also find, as expected, that public contracts are more frequently amended than private contracts.

Our study contributes to contract theory and organizational economics by testing a novel set of propositions based on hazards faced by public-sector procurers. Organizations that are characterized by high degrees of “publicness” differ from “private” organizations because they are more permeable to the political environment [Meier and O’Toole, 2011; Ring and Perry, 1985]. In this paper, we empirically test this permeability, focusing on the degree of contractual rigidity. Our results suggest that previous studies relating public contract inefficiencies to high renegotiation rates [Guasch, 2004; Guasch et al., 2008] might be misleading. Amendments frequently observed in public contracts can be then understood as a consequence of their rigid nature rather than leveraging bargaining power: “In a sense, [...] 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 [Williamson, 1999].

In most democracies, politicians face similar hazards in public procurement which—in addition to legal indictments in court—refer foremost to political challenges that affect their reputation, career, and payoffs. Thus, our setup and results are generalizable to jurisdictions with different legal systems (e.g., civil and common law). We also provide a replicable protocol

⁴See 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—minimizing third-party or governmental opportunism—is empirically strenuous.

to empirically assess contract rigidity in politically competitive jurisdictions.

The paper is organized as follows: In section 2, we return to the specificities of public contracting and 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. In section 5, we discuss the results and limitations of our study. Section 6 concludes.

2 The Specific Nature of Public Contracts

When contracting complex objectives (e.g., uncertain quality or unpredictable future events), the survival of a contract may be at risk. One way to deal with contract complexity is to rely on informal commitments, i.e., relational contracting [Macaulay, 1963].⁵ To rely on relational contracts in the public domain is unfeasible. As Spiller [2008] points out, “when faced with unforeseen or unexpected circumstances, private contractees, as long as the relation remains worthwhile, adjust their required performance without the need for costly renegotiation or formal re-contracting. Public contracting, on the other hand, seems to be characterized by formalized, standardized, bureaucratic, rigid procedures.” Public contracting generates peculiar hazards associated with one of the procurers being subject to public scrutiny to avoid corruption and graft.

Public scrutiny is undertaken not only by designated agencies in charge of contract supervision, but also carried out by interested third parties (e.g., consumer associations, lobbying activities, political opponents, excluded contractors) that may *opportunistically* challenge the *probity* of a public manager [Spiller, 2008]. Opportunistic challenges are not specific to public contracting; in the face of third-party opportunism, however, private companies nor-

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.

mally rely on inter-firm relationships to support contracting through informal and continuous adaptations [Macaulay, 1963].

In anticipation of third-party challenges, both the public administration and the private contractor will bear incentives to increase the specificity of public contracts as compared to equivalent private-to-private contracts. Public contracts are likely to demand more rigid procedures, including formal renegotiation, to inhibit *third-party opportunism*.⁶

On top of that, private contractors are concerned about the risk of *governmental opportunism*, which refers to the ability of governments to change the rules through ordinary administrative powers to extract quasi-rents from investors [Spiller, 1995]. Sunk investments provide politicians with the opportunity to behave opportunistically *vis-à-vis* the investing company, exposing it to the risk of expropriation. Thus, investors will require particular safeguards to deploy capital through the development of institutional arrangements that limit the government's ability to behave opportunistically.⁷

In concert, third-party and governmental opportunism increase the incentives of public managers and private investors to raise contractual rigidity. By their nature, public contracts are born with less flexibility than purely private contracts [Spiller, 2008, p. 21]. This leads us to our first proposition:

Proposition 1. *Public contracts exhibit more rigidity clauses than equivalent private-to-private contracts.*

Ring and Perry [1985] consider public organizations to be more permeable to the exter-

⁶There are many examples illustrating third-party opportunism and its consequences on contractual practices in the public sector. Engel et al. [2014, Box 3.1] describe a forestry company in Latin America that contracted for the construction and maintenance of a 60-kilometer (37-mile) 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 [Engel et al., 2014].

⁷For 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 bypass and limited in their discretionary interpretation. In other words, credible regulatory procedures must restrain the government from opportunistically expropriating an investor's investments [Spiller, 2013].

nal environment than private organizations, because they must cope with the scrutiny of media and their constituents. Third-party opportunism can originate from a multiplicity of sources such as consumer associations, lobbying activities, political opponents, or even private companies that were not retained for the job.

Among the aforesaid sources, political opponents play a major role, notably because they can take advantage of general disapproval to replace the incumbent politician. For the incumbent politician, even simple projects can be difficult to implement if the political environment is hostile.⁸

As a consequence, politics—which is usually extraneous to private contracting—becomes essential in understanding public contracting. Unlike private managers, public managers are subject to exogenous time constraints (i.e., elections). Since public managers do not want to be exposed to potential scandals or accused of bad management in front of their constituents, they prefer to increase the rigidity of a contract to prevent opportunistic challenges from their opponents. This effect might be stronger when electoral competition is fierce. Accordingly, the need for contract rigidity is lower in non-contested political settings. We articulate this reasoning in our second proposition:

Proposition 2. *The frequency of rigidity clauses in public contracts is commensurate to political competition.*

We test these propositions using a novel dataset comprised of public-to-private and private-to-private contracts for parking lots in France. Our focus is on political scrutiny and contract characteristics.

⁸For instance, [Hennessey \[2012, p. 7\]](#) illustrates how public contracts are subject to political hazards alien to private contracts. He relates 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.*”

3 Empirical Analysis

3.1 Sector Characteristics

In many places around the world, cities are responsible for providing on-street and off-street parking spaces. The positive externalities and social benefits (e.g., intermodality and urban development) derived from high-quality construction and efficient parking management justify their remittance to local authorities. While the public authorities must retain ownership of parking spaces, they can outsource the provision of infrastructure and services through public-private arrangements.

In France, outsourcing the construction and management of parking lots to private operators is widespread.⁹ The parking sector is comprised of contending national and international companies,¹⁰ with one national company prevailing [Baffray and Gattet, 2009]. Additionally, the competitive pressure also comes from the threat of municipalization when contracts end. The absence of bilateral dependency between municipalities and operators is possible because parking management is a standard product.

Brown and Potoski [2003] established a ranking of public services built on a survey of public managers' perceptions of asset specificity (i.e., the extent to which resources involved in a given service can be redeployed for other services): parking lots appear among the least asset specific.¹¹

Recent studies on public procurement highlight that parking services are associated with a medium level of resident sensitivity [Beuve and Le Squeren, 2016]. Le Squeren and Moore [2016] emphasize that the price of public parking is one of the front-page topics before local

⁹According to the French Ministry of Sustainable Development, in 2009 73% of parking lots 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.

¹¹For reference, the asset specificity associated with parking lots was 2.36/5, whereas the asset specificity associated with urban transport and water sectors was equal to 3.35 and 3.94, respectively [Brown and Potoski, 2003]. Levin and Tadelis [2010] and Hefetz and Warner [2012] replicate similar levels of asset specificity for the US using the same type of survey.

elections in France. Consequently, the parking sector is susceptible to political interference.¹²

For the aforementioned reasons the parking sector is a suitable arena to investigate the impact of the political dimension of public contracts.

3.2 Contract Characteristics

Three main contractual arrangements encompass the parking sector in France : “concession contracts,” “operating contracts,” and “provision-of-services contracts.”

Concession Contracts are used for greenfield (new) and substantial brownfield (renovated) parking developments. These are long-term contracts (30 years on average in our dataset), which provide sufficient time for private operators to invest and pay off debt. In such contracts, the operator bears the demand risk and collects user fees. Political, economic, social, and technological changes during the execution of the contract may be exogenous to the contractees (e.g., technological developments, economic shocks, and changes in legislation or legal interpretation), or may directly result from internal drivers (e.g., evolving business requirements) or contract maladaptations (e.g., inappropriate initial contractual design).

Operating Contracts are used when parking infrastructure is already built, but requires a significant level of investment to renovate and maintain. These contracts are shorter in time than concession contracts (18.2 years on average in our dataset). As with concession contracts, the operator bears the demand risk and collects user fees. Operating contracts are also subject to the political, economic, social, and technological changes that may occur during execution of the contract.

¹²For example, in June 2015 the daily regional press reported that the city council majority in Saint-Etienne, France, raised prices by renegotiating underground parking contracts entrusted to private partners to comply with a new legislative framework—the “Hamon Law” on consumption adopted in March 18, 2014—which required pricing for every 15 minutes to allow car drivers to pay amounts closer to their actual consumption. The new price schedule was then submitted to the vote of the city council. The motion was refuted by the opposition, which publicly blamed the city council majority for conducting negotiations as “surrogates.” A political opponent 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. See: Xavier 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).

Finally, *Provision-of-Services Contracts* manage existing on-street parking lots, which require no investments. These contracts are the shortest in time (3.2 years on average in our dataset).

3.3 Contractual and Political Data

In the French 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 car parking sector (42% of market share among private operators; 30.6% of total market share) between 1985 and 2009. Overall, we collected 1,189 contractual arrangements signed by this leading parking service provider across 58 departments (out of 96) in metropolitan France. The procurers include 152 public administrations and 24 private companies (clinics, shopping malls, airports).

The political data we gathered concerns the outcomes of all municipal elections from 1983 through 2008.¹³ Elections are organized (in principle) every six years to elect the mayor and the members of the city council by a majority vote. If a majority vote is not achieved in the first round, a second round takes place. Each mayoral candidate presents a list of potential deputies (as many deputies as number of seats on the city council). The list that obtains the most votes obtains 50% of the seats on the city council. The remaining seats are distributed among all lists of potential deputies (including the majority list) which received at least 5% of the votes cast.

The city council, chaired by the mayor, collectively has the legislative authority to manage the affairs of the municipality through its decisions. Her scope of authority spans from approving budgets, determining local tax rates, creating or canceling communal jobs, acquiring and disposing communal property, approving loans, grants, and subsidies, to setting tariffs for communal services and on-street parking.

¹³I.e., 1983, 1989, 1995, 2001, and 2008. The data were obtained through the Center for Socio-Political Data (CDSP).

3.4 Empirical Strategy

Our sample presents the ideal characteristics to test our propositions, as there is only one contractor and parking represents a standard product. Therefore, a large part of the heterogeneity in our dataset comes from the procurer’s organizational type (public versus private), as well as the cross-sectional and time-varying political contestability in the public administrations.

3.4.1 Dependent Variables

To assess the rigidity levels of our contracts we follow [Moszoro et al. \[2016\]](#) and construct “dictionaries” by which we machine-read rigidity categories: arbitration, certification, evaluation, litigation, penalties, contingencies, design, and termination.¹⁴

The rigidity categories capture relevant contractual clauses intended to signal probity and lower the likelihood of challenges by third parties. [Table 1](#) presents the list of search terms clustered into eight rigidity categories¹⁵ and their total count.

These terms univocally relate to their corresponding categories. Arbitration clauses submit plausible disputes to an arbitrator instead of a court.¹⁶ Certification clauses regulate the contractor regarding certification requirements. Evaluation clauses introduce duties regarding delivery. Litigation clauses appear as triggers to a lawsuit. Termination clauses signal ways to resolve intractable contract disruption. Contingency clauses make provisions

¹⁴See, for example, [Parkhe \[1993\]](#) for an application of categories for the analysis of contracts in the management literature and [Loughran and McDonald \[2011\]](#) 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.

¹⁵We machine-read “stemmed” words, i.e., plurals (e.g., penalties) and variations (e.g., penalized) are also included.

¹⁶Contracts 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 managers may also prefer arbitration because it is faster and more confidential than litigation, so they are less exposed to third parties.

for future possible, but uncertain events and circumstances. Finally, design clauses impose product features. We created as many variables as rigidity dimensions.

Table 1: This table presents the search terms grouped into 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

Then, we used the normalized frequencies (i.e., z -values) of the total count of search terms in each category to measure the degree of difference between contracts. For example, we transformed the total word count of search terms in the *Arbitration* category by calculating:

$$z_{Arbitration} = \frac{Arbitration - \mu}{\sigma} \quad (1)$$

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

$$\begin{aligned} zRigidity = & zArbitration + zCertification + zEvaluation + zLitigation \\ & + zPenalties + zTermination + zContingencies + zDesign \end{aligned} \quad (2)$$

As an alternative measure of global rigidity, we also took the contracts' size into account, by totaling the number of words in each contract. We made a double transformation by dividing the instances of each search term per rigidity category by the total number of words

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

in a contract, then used the normalized frequencies of each rigidity category (i.e., y -values). For example, we transformed the word count result of *Arbitration* in the following way:

$$xArbitration = \frac{Arbitration}{\ln(\text{total number of words})} \quad yArbitration = \frac{xArbitration - \mu}{\sigma} \quad (3)$$

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

$$yRigidity = yArbitration + yCertification + yEvaluation + yLitigation \\ + yPenalties + yTermination + yContingencies + yDesign \quad (4)$$

Thus, $zRigidity$ is the sum of normalized counts and $yRigidity$ is the sum of normalized frequencies of search words across eight rigidity categories.

The algorithm we used to parse through the contracts is a rudimentary form of textual analysis. According to contract-law scholars and practitioners, the search terms we utilized are highly unlikely to appear in a context that expresses contradictory connotations to our rigidity categories.¹⁸ Therefore, we are confident that our procedure appropriately, albeit not perfectly, proxies and estimates the frequency of relevant contractual clauses in each contract.

3.4.2 Public versus Private Contracts

The distinct nature of public contracting has been the mainstay of our study. [Moszoro et al. \[2016\]](#) studied contracts in regulated versus non-regulated industries, both in the private domain, thus blurring their measure of “publicness.” They also compared across products and services, which introduces biases into their estimates.

To ensure that we have correctly classified public versus private contracts, we hand-coded a dummy variable *public* that equals one when the contract is signed by a private contractor

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

and a public administration, and zero when the contract is signed by a private contractor and a private procurer. Consequently, a private contract is one where neither the contractor nor the procurer are elected officials, and public accountability is delimited by the standard regulations of the industry.

Our methodology addresses concerns over the ability to compare public-private and private-private contracts, as these contracts may differ along many unobserved dimensions. Despite the possible existence of such dimensions (which include: the nature of services, location, type and history of clients, pricing schemes, subsidies, etc.), the comparability between contracts is validated by the fact that parking agreements correspond to a standard product (see section 3.1 for a description of the parking sector). In fact, it is not really different to manage a parking lot for a public hospital than for a private clinic, as well as it is similar to manage private and public parking lots that are located near airports. Moreover, parking lots located close to shopping centers are alternately managed through public and private contracts.

Lastly, the assignment of the procurer’s type—public or private—is not randomized as they are in controlled trials. Given the competitiveness of the industry, however, from the contractor’s perspective the arrival of contracts from public or private procurers is independent and unbiased.

3.4.3 Political Contestability

In order to study the influence of the political environment on public contracts, we define a set of proxies that 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:

$$HHI_{m,t} = \sum_{i=0}^n P_{i,m,t}^2 \tag{5}$$

where $P_{i,m,t}$ is the vote share of each party i in municipality m at time t during the first round of municipal elections. According to our Proposition 2, we expect that a politically concentrated municipality will lead to less rigid contracts. The Herfindahl-Hirschman index, however, does not take into account that the party with the highest vote share in the first round may not win of the election in the second round.

To address this issue, we define a second variable to capture the opposition's strength. We exclude the winning party $WP_{m,t}$ and look at the concentration of all non-winning parties $NWP_{j,m,t}$, where j stands for all the non-winning parties during the first round of elections. Thus, the variable $Residual_HHI_{m,t}$ in municipality m at time t measures the strength of political opposition. We expect that the stronger the political opposition, the more rigid the contract.

$$Residual_HHI_{m,t} = \frac{\sum_{j=0}^n NWP_{j,m,t}^2}{(1 - WP_{m,t})^2} \quad (6)$$

A usual way to measure political competition is by the margin of victory of the winning party. We thus take into account the margin of victory, $Win_Margin_{m,t}$, as the difference between the winning party's ($WP_{m,t}$) vote share and the runner-up party's ($RUP_{m,t}$) vote share:

$$Win_Margin_{m,t} = \frac{WP_{m,t} - RUP_{m,t}}{\sum_{i=0}^n P_{i,m,t}} \quad (7)$$

We also introduce a square term of the winning margin, $Win_Margin_{m,t}^2$, 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 concerned in intermediate states.

Lastly, political issues generally become more salient as elections approach. We define $Distance_{m,t}$ as the time between the date a contract is signed and the date of the following election. This variable simultaneously captures the closeness of the following elections and the mayor's tenure in office in the political cycle. We introduce a square term, $Distance_{m,t}^2$,

to capture possible non-linear effects. The intuition is that we may find more rigid contracts closer to upcoming election years and less rigid contracts when elections are further in time.

This set of political variables is complementary.

3.4.4 Control Variables

Aside from the procurer types (public or private) and level of political contestability, we include a set of control variables that can explain contractual rigidity. First, we take into account the three different contract types described in section 3.2 through 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. Because these contractual arrangements correspond to different levels of investment and complexity, we should observe that concession contracts are more rigid, and provision-of-services less rigid than operating contracts .

Second, contractual requirements can also vary among the same contract types. We take into account the number of parking places ($Places_{i,t}$) and the type of service ($On-street_{i,t}$, $Underground_{i,t}$, or $Both_Services_{i,t}$) managed by the contract. The type of service is orthogonal to the contract types—concessions, operating, and provision-of-services contracts—thus these variables add to the strength of our analysis.

Third, we control for the city’s size (measured by the natural logarithm of the number of inhabitants, $Inhabitants_{i,t}$) and the political leaning of the city’s mayor ($Left_Wing_{i,t}$ or $Right_Wing_{i,t}$) where the parking lot was located.

Fourth, we introduce several variables to control for path dependency arising from cumulative knowledge or procedural inertia. $Renewed_{i,t}$ is a dummy equal to zero for original contracts and 1 for renewed (follow-up) contracts. $Experience_{i,t}$ represents the relationship length between the contractees in years (i.e., the difference between the dates that the contract was signed and their first bilateral contract). Finally, $Past_Contracts_{i,t}$ captures the

number of all common contracts up to the observation date.

Fifth, since 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 corresponds to the year in which the contract was signed.

Finally, we cluster our estimations at departmental level (58 jurisdictions).

Descriptive statistics of the variables used in the empirical tests are provided in Table 4.

3.4.5 Identification Strategy

Our goal is to explore how public and private contracts differ in relation to levels of rigidity.

To do so, we estimate the following model:

$$Rigidity_{i,t} = \alpha + \beta Public_{i,t} + \sum_j \beta_j \mathbb{X}_{i,t,j} + \epsilon_{i,t} \quad (8)$$

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 it is a public contract, \mathbb{X} 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 introduce our political variables to explore the impact of political contestability on contractual rigidity. Hence, we estimate the following model:

$$Rigidity_{i,t} = \alpha + \sum_j \beta_j \mathbb{X}_{i,t,j} + \sum_k \beta_k \mathbb{Y}_{i,t,k} + \epsilon_{i,t} \quad (9)$$

where $Rigidity_{i,t}$ are our two measures of the rigidity level of contract i signed at date t and \mathbb{Y} is a vector of variables measuring political contestability.

We do not have data on the demand for parking lots at the municipal level. We assume that year and geographic fixed effects absorb most of the unobservable demand heterogeneity.

4 Results

4.1 Public versus Private Contract Rigidity

4.1.1 Total Rigidity

We first estimate the contract rigidity of public against private contracts. Results are given in Table 5. Model 1 with the simplest estimation supports our first proposition: the coefficient associated with *Public* is positive and significant, meaning that public contracts are more rigid than private contracts.

On average, public contracts are longer in duration than private contracts (see Table 2). Thus, investments may also be larger in the public sector, which would explain the more frequent usage of rigidity clauses defining the transaction and its governance. Consequently, the *publicness* of a contract would not be determinant of its rigidity.

Table 2: This table presents the count and frequency of public and private parking 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	

To address this concern, Model 2 includes contract duration as a regressor. Although *Duration* is positively correlated with the level of contract rigidity, the impact of *Public* remains positive and significant.

In Model 3, we introduce another set of control variables related to the services managed by the contract and the common history of contractors. While the introduction of further controls induces a slight decrease in significance, publicness remains a driver of higher rigidity:

on average, public contracts display 1.2 standard deviations more rigidity clauses than private contracts.¹⁹

As a robustness check, we excluded concession contracts from our data. Since there are only two private concession contracts (2% of the concession contracts sample), our results can be driven by an over-representation of public concession contracts. 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) remain similar.

Finally, Models 7–12 in Table 5 present the same regressions as in Models 1–6, but use our alternative measure of contract rigidity (*yRigidity*). All results are similar: on average, public contracts use rigidity clauses 127.5% more frequently than private contracts.²⁰

The remaining control variables provide interesting insights. Provision-of-services contracts are much less rigid (1.3 standard deviations) than operating contracts. In contrast, we do not find significant differences between operating and concession contracts. We also find that contracts managing both on-street and off-street parking lots (*Both_Services*) are more rigid (0.7 standard deviations) than contracts for on-street parking lots only.

Finally, our variable *Trend* indicates that contracts tend to become more rigid over time. This may be indicative of a learning process and/or “red tape” inertia by public administrations, where subsequent arrangements replicate the contractual clauses of previous contracts and add new ones.

¹⁹Our *zRigidity* variable is the sum of eight *z*-scores. Thus, the dummy variable *Public* is associated with an average increase of 9.4/8 standard deviations (i.e., the coefficient on *Public* from Table 5, Model 3, divided by the number of rigidity categories) in rigidity search terms.

²⁰For a back-of-the-envelope calculation, divide the lower-bound coefficient of *Public* from Table 5 (i.e., 10.2 in Model 9) by the number of rigidity categories (i.e., 8).

4.1.2 Rigidity by Categories

Results provided in Table 6 focus on the contractual rigidity categories defined in section 3.4.1. *Public* is positively correlated with three of the eight categories: arbitration, penalties, and litigation. These results are consistent with the descriptive statistics in Table 3: the Welch’s *t*-tests indicate that public and private contracts differ significantly in these three categories.

At the rigidity category level, control variables also provide interesting insights. The duration of a contract is also correlated with two of the eight categories, notably termination. It suggests that contracts tend to incorporate more terms and conditions for termination when partners commit for a long period of time.

Consistently with the results concerning the total level of rigidity, the results on rigidity categories imply that contracts are less rigid for simpler contracts (i.e., *Provision_of_Services*) and more rigid over time (see coefficient on *Trend*).

4.2 Public Contract Rigidity and Political Contestability

We adopt a three-step approach to investigate how political contestability affects the rigidity of public contracts.

First, we run estimations in the sub-sample of public contracts to explore the impact of the set of political contestability measures defined in section 3.4.3. Second, we run exactly the same set of estimations on the sub-sample of private contracts only as a ‘placebo test.’ Third, we use the whole dataset (public and private contracts) and include interaction terms between our political contestability variables and private contracts (*Private*) to see whether there is a differentiated effect.

4.2.1 Step 1

We start from the fully specified Model 3 in Table 5 and consecutively test our proxies of political contestability on contract rigidity. We introduce two additional control variables:

the participation rate in the municipal elections preceding the date the contract was signed (*Election_Participation*) and the number of cases of corruption implicating the mayor or member of the municipal council in the three years preceding the date the contract was signed (*Corruption*). The first variable accounts for the sensitivity of the population on the municipal political life. The second variable, obtained from Transparency International France, considers the possible influence of a corrupted environment on public contracts.²¹

Table 7 provides the results. Our models suggest that political contestability affects public contract rigidity. In line with Proposition 2, the variable *HHI* in Model 1 shows that the concentration of political power in a municipality is associated with less contract rigidity .

As previously stated, the Herfindahl-Hirschman index fails to take into account the strength of the political opposition against the winning party. For this reason, in Model 2 we include an alternative measure of political contestability and look at the concentration of all non-winning lists. The positive and significant correlation between the variables *Residual_HHI* and *zRigidity* indicates that contracts are more rigid when the political opposition is stronger.

Similarly, we find a significant relationship between the rigidity of public contracts and the margin of victory in electoral races (Model 3). Our variables *Win_Margin* and *Win_Margin*² indicate that contracts are more rigid when margins are narrow, i.e., when political contestability is high.

The coefficients associated with the variables *Distance* and *Distance*² indicate that public contracts tend to be more rigid closer to an election. Thus, Models 1–4 lead to results consistent with Proposition 2. The results are almost identical when we use our alternative measure of total rigidity, *yRigidity*, which takes into account contract size (see Models 5–8).

²¹The sizable financial flows involved make public procurement particularly susceptible to fraud and corruption. However, we analyze actual signed contracts, not bid specifications. While over-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 manager to restrict the favored bidder at the contracting stage. Thus, corruption (if any) would bias our estimates towards less rigidity in public contracting.

Obviously, this measure is conditional upon corruption cases being detected and prosecuted, which does not necessarily reflect endemic corruption.

4.2.2 Step 2

As we argue that political scrutiny of contracts is related to its publicness, the expected results of this “placebo test” should be that there are absolutely no impacts of political variables on the level of private contracts’ rigidity. This is precisely what we observe in Table 8: whatever the political contestability variable we use, there is no effect on private contract rigidity—for both rigidity measures, i.e., $zRigidity$ (Models 1–4) and $yRigidity$ (Models 5–8).

4.2.3 Step 3

Results provided in Table 9 confirm the existence of political effects on public contracts, but not on private contracts. Indeed, because we are capturing the effect of considering a private contract (variable *Private*) and the interaction between our political contestability variables and signing a private contract, our political contestability variables are now measuring the impact of political contestability on public contracts. When we use our alternative measure of contract rigidity ($yRigidity$), we note, however, a loss of significance for the variables *HHI* and *Distance*.

There are many indicators of political contestability, and the choice of one indicator over another is not trivial. Our measures—which correspond to the most frequently used in the political economy literature²²—support the hypothesis that the political environment on various dimensions has an impact on public car park contracts’ rigidity in France. Moreover, what appears to be the two most relevant indicators of political contestability—i.e. *Residual_HHI* and *Win_Margin*—are strongly significant and stable across estimations.

We rerun our estimations with clustered standard errors at the city level. The large majority of our results remain unchanged, with the exception of *Distance*, which loses statistical

²²See, e.g., [Le Maux et al. \[2011\]](#) for the use of Herfindal-Hirschman Index and [Solé-Ollé \[2006\]](#) for the use of winning margins as measures of political fragmentation and competition, respectively.

significance at commonly accepted levels.²³

5 Discussion

Our analysis 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 magnitude of the results we obtained, 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 4.2.1 and shown in Tables 7–9, corruption does not play a major role in our setting and, if present, would downwardly bias (weaken) 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, determine the probability of being in our sample. Our sample provides the ideal experiment to test public versus private procurer heterogeneity. Moreover, the competitiveness of the sector and the reputation of the contractor²⁴ silence 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: public managers prefer to highlight rigidity clauses in master agreements instead of ancillary documentation.

Fifth, there are other factors that we are not able to control for and that could influence our results, foremost, different demand stochasticity (risk) and corresponding pricing strategies

²³These tables are available from the Authors upon request.

²⁴The contractor is the largest car park provider in France.

in municipalities that could drive contract characteristics . We do not have data nor good variables to proxy demand stochasticity, nor for car park prices at the municipal level. Year and geographic fixed effects, however, take care of part of this heterogeneity.

Finally, we find empirical evidence that public contracts are more frequently renegotiated in amendments than private contracts. Parametric and non-parametric tests of mean comparisons of the number of amendments signed by public and private procurers indicate that public contracts are more frequently renegotiated in formal amendments than private contracts (see Table 10). Because relational (“informal”) adaptations are generally alien to the public domain, renegotiations redound to *formal* amendments. In other words, the political hazards—third-party and governmental opportunism—that induce higher rigidity in public contracts may be also conducive to more frequent formal renegotiations in amendments. The frequent renegotiation of public contracts, instead of being a sign of weakness [Guasch, 2004], might provide a “relational quality” [Spiller, 2008] and indicate that the contractees are willing to adapt through time. Detail data, taking into account many factors that could impact the frequency of renegotiations, would be required to test this conjecture.

6 Conclusions

In this paper, we investigated the specific nature of public organizations focusing on political scrutiny and contractual proceduralization. We compared procurement contracts in which the procurer was either a public entity (municipality) or a private corporation, and used textual analysis on a dataset of contracts for a standard and competitive product to determine the level of contractual rigidity. We found that public contracts feature around twice as many rigidity clauses than private contracts and that contractual rigidity rises in political contestability proxied by partisan concentration and winning margins in electoral races. We argue that a significant part of the differences in contractual rigidity between purely private and

public contracts is a political risk adaptation of public managers to curb plausible challenges from political contesters and interest groups.

Our study also contributes to contract theory by advancing a novel set of propositions based on third-party hazards specific to public procurers. Our results suggest that previous empirical studies pointing to the inefficiencies of public contracts related to high renegotiation rates is misleading. Frequent renegotiations observed in public contracts can be understood as a consequence of their specific rigid nature instead of a manifestation of governmental opportunism.

To our knowledge, this is the first paper to investigate the intrinsic properties of public contracts using data for the procurement of a standard product with measures of contractual rigidity, frequency of amendments, corruption, and political contestability, and a clear-cut public/private identification. It opens research avenues in organizational economics; for example, the cost-benefit analysis of political scrutiny, how public managers internalize political hazards, and how the frequency of public contracts' renegotiations affects the willingness of the contractees to continue their relationship.

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 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					Provision-of-Services Contracts					Concession Contracts				
	N	μ	σ	min	max	N	μ	σ	min	max	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	146	0.88	0.32	0.00	1.00	90	0.99	0.11	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	146	-3.70	14.33	-27.64	42.91	90	4.24	12.89	-27.35	41.51
<i>zDesign</i>	396	0.04	1.52	-0.50	13.55	160	0.34	2.05	-0.50	13.55	146	-0.19	0.89	-0.50	5.37	90	-0.11	1.11	-0.50	4.83
<i>zTermination</i>	396	0.08	3.43	-2.40	24.02	160	0.65	3.59	-2.40	14.46	146	-0.63	2.91	-2.40	13.50	90	0.20	3.74	-2.40	24.02
<i>zArbitrage</i>	396	0.50	3.61	-4.77	21.13	160	0.90	4.14	-4.43	21.13	146	0.05	3.47	-4.77	17.26	90	0.52	2.63	-4.48	10.80
<i>zPenalties</i>	396	0.43	3.61	-4.75	20.60	160	1.33	3.70	-4.75	20.60	146	-1.53	2.70	-4.75	8.39	90	2.03	3.35	-4.75	8.14
<i>zCertification</i>	396	0.34	3.21	-3.00	18.25	160	0.73	3.42	-3.00	15.79	146	-0.23	3.41	-3.00	18.25	90	0.56	2.23	-3.00	6.10
<i>zEvaluation</i>	396	0.50	4.24	-5.61	24.11	160	1.40	4.62	-5.39	24.11	146	-0.04	4.09	-5.61	22.34	90	-0.21	3.45	-5.61	11.90
<i>zLitigation</i>	396	0.28	3.55	-4.63	19.36	160	0.86	3.43	-4.63	11.89	146	-0.68	3.71	-4.63	19.36	90	0.82	3.20	-4.63	17.03
<i>zContingencies</i>	396	0.04	2.76	-2.45	17.64	160	0.21	3.39	-2.45	17.64	146	-0.58	2.00	-2.45	10.55	90	0.72	2.40	-2.45	10.41
<i>yTotRigid</i>	396	2.22	17.18	-27.24	87.73	160	6.54	19.29	-23.35	87.73	146	-3.93	14.96	-27.24	47.10	90	4.52	13.41	-27.08	43.36
<i>Renewed</i>	396	0.16	0.37	0.00	1.00	160	0.12	0.32	0.00	1.00	146	0.28	0.45	0.00	1.00	90	0.03	0.18	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	146	10.16	1.26	8.09	14.00	90	11.96	1.74	9.12	14.08
<i>Left_Wing</i>	396	0.15	0.35	0.00	1.00	160	0.16	0.37	0.00	1.00	146	0.04	0.20	0.00	1.00	90	0.29	0.46	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	146	0.36	0.48	0.00	1.00	90	0.09	0.29	0.00	1.00
<i>Trend</i>	396	2.000	7.41	1.985	2.009	160	2.000	7.36	1.985	2.009	146	2.005	3.20	1.986	2.009	90	1.994	6.73	1.985	2.009
<i>Duration</i>	396	15.00	15.12	1.00	65.00	160	16.61	14.67	1.00	65.00	146	3.59	4.81	1.00	40.00	90	30.67	11.25	2.00	65.00
<i>Places</i>	393	1.694	12.297	9.00	241.600	160	1.331	2.763	83.00	23.481	143	2.636	20.174	9.00	241.600	90	844	790	30.00	4.330
<i>Experience</i>	396	9.85	12.33	0.00	46.00	160	8.06	11.70	0.00	42.00	146	8.62	11.02	0.00	43.00	90	15.03	14.02	0.00	46.00
<i>Past_Contracts</i>	396	5.46	13.07	0.00	68.00	160	3.33	10.55	0.00	65.00	146	2.47	7.02	0.00	68.00	90	14.12	19.51	0.00	62.00
<i>Average_Amendments</i>	396	0.19	0.33	0.00	2.00	160	0.18	0.29	0.00	1.71	146	0.24	0.41	0.00	2.00	90	0.12	0.20	0.00	1.40
<i>Election_Participation</i>	329	0.59	0.08	0.35	0.90	136	0.59	0.09	0.44	0.90	139	0.56	0.06	0.35	0.78	54	0.63	0.08	0.47	0.80
<i>Corruption</i>	347	0.24	0.79	0.00	5.00	151	0.18	0.64	0.00	5.00	141	0.08	0.28	0.00	1.00	55	0.57	1.26	0.00	5.00
<i>HHI</i>	347	0.39	0.12	0.20	1.00	151	0.38	0.11	0.20	0.67	141	0.39	0.14	0.20	1.00	55	0.40	0.09	0.20	0.62
<i>Residual_HHI</i>	347	0.42	0.25	0.00	1.00	151	0.43	0.23	0.03	1.00	141	0.37	0.26	0.00	1.00	55	0.53	0.24	0.09	1.00
<i>Win_Margin</i>	347	20.82	16.30	0.15	100.00	151	20.11	14.65	0.31	63.43	141	22.29	19.14	0.15	100.00	55	18.90	11.93	0.31	49.80
<i>Distance</i>	347	2.60	2.61	0.00	6.00	151	2.68	1.84	0.00	6.00	141	2.54	1.87	0.00	6.00	55	2.56	1.37	0.00	5.00

Table 5: This table presents results from panel OLS regressions of the normalized counts ($zRigidity$, Models 1–6) and the normalized frequencies ($yRigidity$, models 7–12) of rigidity search terms on procurer type, and contract characteristics and controls. Heteroskedasticity-robust standard errors are clustered at the department level and reported in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Dependent variable	Model 1			Model 2			Model 3			Model 4			Model 5			Model 6			Model 7			Model 8			Model 9			Model 10			Model 11			Model 12			
										$zRigidity$									$yRigidity$																		
<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)	11.723** (4.444)	10.362** (4.424)	10.193* (5.718)	12.424** (4.768)	11.013** (4.563)	10.152* (5.791)	11.723** (4.444)	10.362** (4.424)	10.193* (5.718)	12.424** (4.768)	11.013** (4.563)	10.152* (5.791)	11.723** (4.444)	10.362** (4.424)	10.193* (5.718)	12.424** (4.768)	11.013** (4.563)	10.152* (5.791)	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)	-3.217 (2.284)	-3.084 (2.298)	-2.921 (2.129)	-3.184 (2.556)	-2.991 (2.519)	-2.782 (2.295)	-3.217 (2.284)	-3.084 (2.298)	-2.921 (2.129)	-3.184 (2.556)	-2.991 (2.519)	-2.782 (2.295)	-3.217 (2.284)	-3.084 (2.298)	-2.921 (2.129)	-3.184 (2.556)	-2.991 (2.519)	-2.782 (2.295)	-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)	-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)	-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)	-	-	-	-0.672 (2.180)	-2.060 (2.177)	-0.962 (1.934)	-	-	-	-0.672 (2.180)	-2.060 (2.177)	-0.962 (1.934)	-	-	-	-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)	0.127 (0.697)	0.133 (0.692)	0.280 (1.376)	0.648 (1.022)	0.655 (1.017)	0.497 (1.558)	0.127 (0.697)	0.133 (0.692)	0.280 (1.376)	0.648 (1.022)	0.655 (1.017)	0.497 (1.558)	0.127 (0.697)	0.133 (0.692)	0.280 (1.376)	0.648 (1.022)	0.655 (1.017)	0.497 (1.558)	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)	-0.301 (1.976)	-1.284 (1.914)	0.018 (1.907)	1.015 (3.385)	-0.296 (3.102)	0.938 (2.965)	-0.301 (1.976)	-1.284 (1.914)	0.018 (1.907)	1.015 (3.385)	-0.296 (3.102)	0.938 (2.965)	-0.301 (1.976)	-1.284 (1.914)	0.018 (1.907)	1.015 (3.385)	-0.296 (3.102)	0.938 (2.965)	-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)	2.133 (2.113)	1.949 (2.084)	0.583 (2.243)	2.545 (2.246)	2.451 (2.222)	1.120 (2.385)	2.133 (2.113)	1.949 (2.084)	0.583 (2.243)	2.545 (2.246)	2.451 (2.222)	1.120 (2.385)	2.133 (2.113)	1.949 (2.084)	0.583 (2.243)	2.545 (2.246)	2.451 (2.222)	1.120 (2.385)	1.120 (2.385)	1.120 (2.385)	1.120 (2.385)	1.120 (2.385)	1.120 (2.385)	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)	0.558*** (0.172)	0.727** (0.174)	0.728*** (0.177)	0.623** (0.263)	0.804*** (0.270)	0.786*** (0.274)	0.558*** (0.172)	0.727** (0.174)	0.728*** (0.177)	0.623** (0.263)	0.804*** (0.270)	0.786*** (0.274)	0.558*** (0.172)	0.727** (0.174)	0.728*** (0.177)	0.623** (0.263)	0.804*** (0.270)	0.786*** (0.274)	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)	-	0.190** (0.089)	0.188** (0.084)	-	0.199** (0.099)	0.206** (0.096)	-	0.190** (0.089)	0.188** (0.084)	-	0.199** (0.099)	0.206** (0.096)	-	0.190** (0.089)	0.188** (0.084)	-	0.199** (0.099)	0.206** (0.096)	-	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)	-	-	0.001*** (0.000)	-	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)	-	-	-	-	-0.000*** (0.000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Underground</i>	-	-	3.050 (2.038)	-	-	2.827 (2.138)	-	-	3.537 (2.119)	-	3.309 (2.237)	-	-	3.537 (2.119)	-	3.309 (2.237)	-	3.309 (2.237)	-	3.537 (2.119)	-	3.309 (2.237)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Both_Services</i>	-	-	5.238* (2.863)	-	-	5.300* (3.143)	-	-	6.036* (3.030)	-	6.111* (3.328)	-	-	6.036* (3.030)	-	6.111* (3.328)	-	6.111* (3.328)	-	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)	-	-	0.052 (0.143)	-	0.062 (0.162)	-	0.062 (0.162)	-	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)	-	-	-0.125 (0.096)	-	-0.132 (0.106)	-	-0.132 (0.106)	-	-0.125 (0.096)	-	-0.132 (0.106)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>N</i>	396	396	393	306	306	303	396	396	393	306	303	396	396	393	306	306	303	396	396	393	306	306	303	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	0.159	0.169	0.226	0.171	0.180	0.159	0.169	0.226	0.171	0.180	0.159	0.169	0.226	0.171	0.180	0.159	0.169	0.226	0.171	0.180	0.159	0.169	0.226	0.171	0.180	

Table 6: This table presents results from panel OLS regressions of the normalized counts ($zCategory$, upper panel) and the normalized frequencies ($yCategory$, lower panel) of search terms by rigidity category on procurer type, and contract characteristics and controls. Heteroskedasticity-robust standard errors are clustered at the department level and reported in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Dependent variables	$zDesign$	$zTermination$	$zArbitration$	$zPenalties$	$zCertification$	$zEvaluation$	$zLitigation$	$zContingencies$
<i>Public</i>	-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>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>	-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>r²</i>	0.099	0.081	0.116	0.290	0.103	0.220	0.131	0.211

Dependent variables	$yDesign$	$yTermination$	$yArbitration$	$yPenalties$	$yCertification$	$yEvaluation$	$yLitigation$	$yContingencies$
<i>Public</i>	-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>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>	-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>r²</i>	0.098	0.083	0.123	0.294	0.104	0.222	0.139	0.213

Table 7: This table presents results from panel OLS regressions of the normalized counts ($zRigidity$, Models 1–4) and the normalized frequencies ($yRigidity$, models 5–8) of rigidity search terms on political contestability variables, contract characteristics and controls for **the subsample of public contracts**. Heteroskedasticity-robust standard errors are clustered at the department level and reported in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 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>	-2.782 (2.683)	-3.336 (2.878)	-3.025 (2.766)	-3.050 (2.822)	-3.019 (2.830)	-3.676 (3.024)	-3.269 (2.911)	-3.334 (2.949)
<i>Provision_of_Services</i>	-10.651*** (2.965)	-10.706*** (3.023)	-10.435*** (3.021)	-10.510*** (3.001)	-11.007*** (3.103)	-11.006*** (3.147)	-10.782*** (3.159)	-10.797*** (3.123)
<i>Concession</i>	-1.243 (2.306)	-1.977 (2.243)	-1.751 (2.287)	-1.625 (2.210)	-1.125 (2.468)	-1.900 (2.379)	-1.632 (2.440)	-1.500 (2.359)
<i>Inhabitants</i>	0.423 (1.370)	1.544 (1.486)	0.926 (1.366)	1.340 (1.446)	0.422 (1.390)	1.565 (1.518)	0.918 (1.387)	1.329 (1.467)
<i>Left_Wing</i>	-0.630 (2.953)	-0.733 (2.758)	0.042 (3.042)	-0.494 (2.828)	-0.676 (2.993)	-0.824 (2.800)	0.010 (3.107)	-0.552 (2.863)
<i>Right_Wing</i>	-0.006 (2.451)	1.003 (2.562)	-0.899 (2.425)	-0.027 (2.512)	-0.258 (2.580)	0.947 (2.707)	-1.163 (2.558)	-0.245 (2.649)
<i>Duration</i>	0.154* (0.090)	0.174* (0.089)	0.165* (0.088)	0.163* (0.086)	0.156* (0.093)	0.178* (0.092)	0.168* (0.091)	0.166* (0.089)
<i>Trend</i>	0.743*** (0.213)	0.843*** (0.223)	0.814*** (0.209)	0.702*** (0.220)	0.791*** (0.228)	0.897*** (0.236)	0.864*** (0.223)	0.737*** (0.231)
<i>Election_participation</i>	18.336 (15.650)	7.913 (14.616)	14.932 (14.860)	12.638 (17.099)	19.678 (16.658)	8.074 (15.384)	16.373 (15.721)	13.605 (17.915)
<i>Corruption</i>	2.264 (1.669)	2.233 (1.984)	2.109 (1.980)	2.168 (2.156)	1.946 (1.679)	1.946 (1.987)	1.791 (1.959)	1.865 (2.143)
<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>	3.091 (2.742)	3.565 (2.590)	3.480 (2.612)	3.482 (2.737)	3.597 (2.837)	4.071 (2.653)	3.974 (2.708)	3.975 (2.819)
<i>Both_Services</i>	6.460** (2.862)	6.563** (3.026)	6.770** (2.962)	6.395** (3.036)	7.265** (2.984)	7.394** (3.126)	7.567** (3.091)	7.202** (3.142)
<i>Experience</i>	0.079 (0.165)	0.080 (0.165)	0.100 (0.173)	0.104 (0.171)	0.057 (0.174)	0.059 (0.172)	0.079 (0.182)	0.086 (0.179)
<i>Past_Contracts</i>	-0.587 (0.882)	-0.696 (0.864)	-0.742 (0.849)	-0.837 (0.866)	-0.519 (0.933)	-0.640 (0.914)	-0.678 (0.900)	-0.794 (0.923)
Political Contestability Variables								
<i>HHI</i>	-17.266** (6.667)	-	-	-	-17.035** (6.856)	-	-	-
<i>Residual_HHI</i>	-	8.223* (4.193)	-	-	-	9.437** (4.391)	-	-
<i>Win_Margin</i>	-	-	0.224* (0.123)	-	-	-	0.230* (0.129)	-
<i>Win_Margin²</i>	-	-	-0.004*** (0.001)	-	-	-	-0.004*** (0.001)	-
<i>Distance</i>	-	-	-	-2.662* (1.393)	-	-	-	-2.968** (1.439)
<i>Distance²</i>	-	-	-	0.387* (0.226)	-	-	-	0.430* (0.234)
<i>N</i>	300	300	300	300	300	300	300	300
<i>r²</i>	0.265	0.268	0.276	0.263	0.266	0.272	0.276	0.266

Table 8: This table presents results from panel OLS regressions of the normalized counts (*zRigidity*, Models 1–4) and the normalized frequencies (*yRigidity*, models 5–8) of rigidity search terms on political contestability variables, contract characteristics and controls for **the subsample of private contracts**. Heteroskedasticity-robust standard errors are clustered at the department level and reported in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 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>	9.436 (10.111)	-15.537 (16.574)	8.310 (13.196)	12.263 (10.368)	9.736 (10.907)	-17.175 (17.951)	8.602 (14.257)	12.766 (11.017)
<i>Provision_of_Services</i>	15.308 (9.000)	11.708 (12.789)	28.853** (11.685)	26.229** (9.541)	14.468 (9.520)	10.590 (13.637)	28.747** (13.108)	26.509** (9.924)
<i>Concession</i>	16.387 (10.614)	-6.566 (11.070)	10.352 (10.971)	-2.356 (4.858)	18.392 (11.530)	-6.348 (12.002)	11.947 (11.931)	-2.117 (5.553)
<i>Inhabitants</i>	-2.469 (2.802)	-11.989 (7.825)	-5.261 (5.212)	-5.456 (5.432)	-2.816 (3.058)	-13.080 (8.488)	-5.845 (5.690)	-6.014 (5.888)
<i>Left_Wing</i>	12.708 (10.289)	14.545 (15.811)	15.988 (17.073)	30.622 (24.689)	14.049 (11.096)	16.039 (17.271)	17.702 (18.523)	33.522 (26.593)
<i>Right_Wing</i>	-4.155 (6.103)	13.322 (8.934)	1.914 (7.382)	3.584 (6.660)	-4.880 (6.531)	13.964 (9.809)	1.737 (8.147)	3.473 (7.293)
<i>Duration</i>	-0.771 (0.691)	-0.595 (0.716)	-0.889 (0.895)	-1.198 (1.071)	-0.741 (0.748)	-0.552 (0.775)	-0.872 (0.969)	-1.201 (1.153)
<i>Trend</i>	0.185 (0.880)	0.596 (1.349)	0.647 (1.397)	0.793 (1.874)	0.396 (0.941)	0.839 (1.463)	0.883 (1.502)	1.056 (1.999)
<i>Election_Participation</i>	66.866 (91.207)	106.844 (112.089)	35.341 (78.882)	226.251 (169.618)	69.295 (97.852)	112.389 (121.714)	36.368 (85.476)	244.362 (184.866)
<i>Corruption</i>	-1.361 (5.381)	3.759 (4.408)	-1.224 (9.347)	-3.634 (4.398)	-1.601 (5.844)	3.918 (4.654)	-1.428 (10.125)	-4.142 (4.804)
<i>Places</i>	-0.007 (0.008)	0.006 (0.005)	-0.001 (0.008)	0.006 (0.006)	-0.007 (0.009)	0.006 (0.006)	-0.001 (0.008)	0.006 (0.006)
<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>	14.460 (9.722)	28.972 (17.977)	10.535 (9.119)	9.836 (11.969)	14.142 (10.528)	29.775 (19.474)	9.878 (9.945)	9.104 (13.020)
<i>Both_Services</i>	-5.822 (5.297)	-2.988 (9.138)	0.281 (13.187)	-13.720 (15.172)	-7.736 (5.797)	-4.691 (9.682)	-1.483 (13.943)	-16.189 (16.098)
<i>Experience</i>	0.909 (1.048)	1.883 (1.384)	0.247 (0.984)	0.390 (1.050)	0.968 (1.133)	2.017 (1.494)	0.257 (1.089)	0.408 (1.130)
<i>Past_Contracts</i>	-1.026 (0.782)	-1.602 (1.012)	-0.437 (0.725)	-0.435 (0.797)	-1.058 (0.846)	-1.678 (1.094)	-0.426 (0.802)	-0.418 (0.857)
Political Contestability Variables								
<i>HHI</i>	123.745 (101.934)	-	-	-	133.506 (109.580)	-	-	-
<i>Residual_HHI</i>	-	85.043 (49.194)	-	-	-	91.646 (53.089)	-	-
<i>Win_Margin</i>	-	-	1.823 (1.378)	-	-	-	1.915 (1.516)	-
<i>Win_Margin²</i>	-	-	-0.024 (0.028)	-	-	-	-0.025 (0.031)	-
<i>Distance</i>	-	-	-	6.003 (7.941)	-	-	-	6.438 (8.456)
<i>Distance²</i>	-	-	-	0.022 (0.965)	-	-	-	0.053 (1.015)
<i>N</i>	47	47	47	47	47	47	47	47
<i>r²</i>	0.431	0.428	0.312	0.354	0.431	0.429	0.309	0.360

Table 9: This table presents results from panel OLS regressions of the normalized counts ($zRigidity$, Models 1–4) and the normalized frequencies ($yRigidity$, models 5–8) of rigidity search terms on contract characteristics and controls for the **whole sample of public and private contracts, and with interaction terms for political contestability variables and procurer type**. Heteroskedasticity-robust standard errors are clustered at the department level and reported in parenthesis; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Dependent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
	$zRigidity$				$yRigidity$			
<i>Renewed</i>	-2.602 (2.232)	-4.004 (2.511)	-3.323 (2.308)	-3.241 (2.322)	-2.845 (2.336)	-4.393* (2.614)	-3.576 (2.427)	-3.525 (2.400)
<i>Provision_of_Services</i>	-3.630 (2.672)	-3.643 (2.716)	-3.332 (2.494)	-3.557 (2.735)	-3.768 (2.813)	-3.751 (2.854)	-3.426 (2.618)	-3.653 (2.872)
<i>Concession</i>	-0.260 (2.475)	-1.254 (2.234)	-0.803 (2.407)	-1.024 (2.329)	-0.094 (2.673)	-1.154 (2.382)	-0.630 (2.584)	-0.875 (2.498)
<i>Inhabitants</i>	0.901 (1.054)	-0.362 (1.873)	-0.225 (1.404)	0.283 (1.301)	0.942 (1.064)	-0.497 (2.012)	-0.314 (1.489)	0.227 (1.359)
<i>Left_Wing</i>	-0.213 (2.397)	-0.405 (2.261)	-0.137 (2.567)	-0.065 (2.420)	-0.276 (2.430)	-0.489 (2.275)	-0.228 (2.620)	-0.083 (2.444)
<i>Right_Wing</i>	1.056 (2.229)	3.223 (2.684)	0.714 (2.244)	1.562 (2.361)	0.794 (2.328)	3.255 (2.868)	0.478 (2.347)	1.371 (2.481)
<i>Duration</i>	0.254*** (0.080)	0.272*** (0.076)	0.260*** (0.076)	0.249*** (0.074)	0.262*** (0.082)	0.281*** (0.078)	0.269*** (0.078)	0.256*** (0.076)
<i>Trend</i>	0.603*** (0.221)	0.549** (0.213)	0.570** (0.220)	0.460* (0.244)	0.664*** (0.233)	0.604*** (0.220)	0.624*** (0.229)	0.507* (0.253)
<i>Election_Participation</i>	11.877 (15.181)	-2.992 (14.730)	6.120 (15.697)	8.345 (18.127)	13.919 (15.916)	-2.713 (15.375)	7.797 (16.377)	10.237 (19.020)
<i>Corruption</i>	1.421 (2.151)	0.159 (3.314)	0.370 (2.915)	0.618 (2.804)	1.173 (2.162)	-0.197 (3.361)	0.008 (2.946)	0.322 (2.811)
<i>Places</i>	0.002* (0.001)	0.002*** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (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>	-3.493 (2.586)	-5.289** (2.249)	-4.597* (2.379)	-5.427** (2.164)	-4.087 (2.675)	-6.004** (2.310)	-5.259** (2.460)	-6.168*** (2.211)
<i>Both_Services</i>	4.262 (2.636)	2.463 (2.893)	3.901 (2.684)	2.844 (2.731)	4.436 (2.797)	2.530 (3.078)	4.063 (2.836)	2.947 (2.900)
<i>Experience</i>	0.113 (0.133)	0.181 (0.151)	0.164 (0.142)	0.151 (0.144)	0.097 (0.138)	0.170 (0.158)	0.151 (0.149)	0.136 (0.148)
<i>Past_Contracts</i>	-0.470** (0.198)	-0.546* (0.276)	-0.479** (0.215)	-0.444** (0.220)	-0.446** (0.209)	-0.530* (0.291)	-0.453** (0.225)	-0.414* (0.231)
<i>Private</i>	-42.308* (22.434)	-11.281 (8.478)	-17.474* (10.067)	-10.863 (9.683)	-45.494* (24.223)	-12.419 (8.832)	-19.622* (10.698)	-11.878 (10.328)
Political Contestability Variables								
<i>HHI</i>	-13.884* (7.913)	-	-	-	-13.369 (8.181)	-	-	-
<i>HHI*Private</i>	103.023 (79.573)	-	-	-	110.336 (86.234)	-	-	-
<i>Residual_HHI</i>	-	9.180** (4.175)	-	-	-	10.434** (4.339)	-	-
<i>Residual_HHI*Private</i>	-	11.188 (31.654)	-	-	-	12.458 (33.601)	-	-
<i>Win_Margin</i>	-	-	0.232* (0.130)	-	-	-	0.238* (0.136)	-
<i>Win_Margin²</i>	-	-	-0.005*** (0.001)	-	-	-	-0.005*** (0.001)	-
<i>Win_Margin*Private</i>	-	-	0.844 (1.142)	-	-	-	0.978 (1.244)	-
<i>Win_Margin²*Private</i>	-	-	-0.010 (0.020)	-	-	-	-0.012 (0.021)	-
<i>Distance*Private</i>	-	-	-	0.047 (5.250)	-	-	-	-0.017 (5.633)
<i>Distance</i>	-	-	-	-2.836* (1.617)	-	-	-	-3.116* (1.668)
<i>Distance²</i>	-	-	-	0.372 (0.276)	-	-	-	0.412 (0.286)
<i>Distance²*Private</i>	-	-	-	0.282 (0.850)	-	-	-	0.323 (0.921)
<i>N</i>	347	347	347	347	347	347	347	347
<i>r²</i>	0.222	0.195	0.208	0.190	0.226	0.200	0.212	0.194

Table 10: This table presents results from parametric and non-parametric mean comparisons between the panels of public and private contracts. The variable of interest is the number of formal amendments signed during the contract lifetime. We counted only two private concession contracts (2% of the concession contracts sample). To avoid the over-representation of public concession contracts in the estimations, we excluded concession contracts.

	Public		Private		$m_{Pub} = m_{Pri}$	
	m	σ	m	σ	Z	P(Z)
Number of Amendments	1.84	0.19	0.72	0.17		
<i>Parametric test</i>						
Two-sample					-2.48	0.07
<i>Non-parametric tests</i>						
Median test					2.89	0.09
Wilcoxon (Mann-Whitney) test					-2.21	0.03

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