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

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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

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

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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 12% 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 primarily 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 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 [2018], 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.

[1] See: http://www.oecd.org/gov/ethics/public-procurement.htm, accessed February 2018. In the EU, public procurement is comparatively large—ca. 16% of GDP (http://ec.europa.eu/trade/policy/accessing-markets/public-procurement/, accessed February 2018.

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

Public contracting is awarded through 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, 2018]. 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 a large sample of contractual arrangements signed between a private operator and 24 private procurers (which we call "private contracts") and between the same private operator and 132 public authorities (which we call "public contracts") for which we were able to gather data on local elections.

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. We further compare the sub-sample 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

[3] In this regard, contract rigidity is the opposite of "best efforts" or "reasonable adaptation" clauses.

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]

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. The corollary is that the perceived inefficiency of public contracting is mostly 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 to 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. In section 4, we show the results of our tests and robustness checks. In section 5, we utilize a natural experiment involving a change in public procurement scrutiny to show the causal effect of political contestability to contract rigidity. In section 6, we discuss the results and limitations of our study. Section 7 concludes.

[4]See 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.

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 normally 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 to inhibit *third-party opportunism*.[6]

[5] Relational 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 the 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.

[6] Many examples illustrate 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

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 rationale 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 external 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 significant 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

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].

[7]For 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].

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.

This argument is consistent with previous empirical findings. For instance, Berliner and Erlich [2015] argue that political competition is a significant driver of transparency reforms in the Mexican states. When competitive political environments create high uncertainty over future political control, such reforms can serve as insurance mechanisms enabling ruling groups to protect their access to government information and to preserve means of monitoring future incumbents, in case they lose power. 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 contracts characteristics.

[8]For 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 French car park sector is characterized by a growing level of competitive pressure between French firms (local operators as well as larger companies) and, more recently, between national and foreign operators [Baffray and Gattet, 2009].[10] Additionally, the competitive pressure also comes from the threat of municipalization when contracts end (i.e., contracting parties are not locked in through specific investments at the contract renewal). The absence of bilateral dependency between municipalities and operators is possible because parking management is a standard product. According to a survey of public managers' perceptions, parking lots appear among the least asset specific [Brown and Potoski, 2003].[11]

On the other hand, recent studies on public procurement highlight that parking services are associated with a medium level of resident sensitivity and the price of public parking is one of the front-page topics before local elections in France [Beuve and Le Squeren, 2016].

[9] According to the French Ministry of Sustainable Development, in 2009 73% of parking lots were organized through outsourced management and 27% were provided in-house through public provision.

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

[11] For 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.

Consequently, the parking sector is susceptible to political interference.[12]

For the reasons mentioned above, 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. In our dataset as well as in real life, concessions are essentially used by municipalities and not by private procurers.[13] Therefore, we excluded concessions from our sample.

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). 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.

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).

[12] For 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 rejected 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 counsel 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: https://www.lessor42.fr/parkings-une-renegociation-plus-ou-moins-bonne-10303.html, accessed June 26, 2018.

[13] We have only two concessions private contracts in our data.

3.3 Contractual and Political Data

In the French parking sector, there is no regulatory authority and data is 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).

The entire dataset is composed of almost 1,000 contracts signed between 1963 and 2008. As mentioned earlier, we excluded concession contracts: focusing on operating and provision-of-services contracts allows for a fairer comparison among different levels of contract rigidity. Municipal election data is available since 1983, which further narrowed our sample. Finally, we also excluded observations from very small cities for which the elections data is not available and metropolitan areas—i.e., Paris, Lyon and Marseille—where the electoral system is organized in administrative districts (i.e., *arrondissements*).

We ended with 279 contractual arrangements signed by the leading parking service provider across 58 departments (out of 96) in metropolitan France. The procurers include 132 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.[14] 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 the 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

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

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 of communal property, approving loans, grants, and subsidies, to setting tariffs for communal services and on-street parking.

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

First, we converted our source contracts from scanned PDF files into machine-readable text with great accuracy using OCR (Optical Character Recognition) software.

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, termination, and contingencies.[15]

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 seven rigidity categories[16] and their total count.

[15] See, 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 U.S. Securities and Exchange Commission (SEC) filings.

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

These terms univocally relate to their corresponding categories. Arbitration clauses submit plausible disputes to an arbitrator instead of a court.[17] Certification clauses regulate the contractor regarding certification requirements. Evaluation clauses introduce duties regarding delivery. Litigation clauses appear as triggers to a lawsuit. Penalty clauses describe the damages and sanctions for contract breaching. Termination clauses signal ways to resolve intractable contract disruption. Finally, contingency clauses make provisions for future possible, but uncertain events and circumstances. We created as many variables as rigidity dimensions.

Table 1: This table presents the search terms grouped into rigidity categories.

Arbitration	appeal, arbitration, conciliation, guarantee, intervention, mediation, settlement, warranty, whereas[18]	10,241
Certification	certification, permit, regulation	3,263
Evaluation	accountability, control, covenant, obligation, quality, specification, scrutiny	8,090
Litigation	court, dispute, indictment, jury, lawsuit, litigation, pleading, prosecution, trial	2,479
Penalties	damage, fine, indemnification, penalty, sanction	5,431
Termination	breach, cancel, dissolution, separation, termination, unilateral	580
Contingencies	contingent, if, provided that, providing that, subject to, whenever, whether	4,488
Total		34,572

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:

$$zArbitration = \frac{Arbitration - \mu}{\sigma} \tag{1}$$

[17] Contracts submitting to arbitration have more details because there will be fewer 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.

[18] See Schwartz and Watson [2012] for an explanation of the appropriateness of "whereas" as an arbitration keyword.

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*:

$$zRigidity = zArbitration + zCertification + zEvaluation + zLitigation + zPenalties + zTermination + zContingencies \quad (2)$$

For robustness, we check an alternative measure of rigidity, where we took the contracts' size into account by accounting for 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 in a contract, then used the normalized frequencies of each rigidity category. The estimates were similar in magnitude and statistical significance, thus further on we report estimates using *zRigidity* variables.[19]

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.[20] Therefore, we are confident that our procedure appropriately, albeit not entirely, 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

[19] The estimations using this alternative measure are provided in Appendix A.

[20] For 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 is an elected official,s 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 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

Measuring political contestability is not easy. We use several measures of political competition which have been used by other researchers.

Besley et al. [2010] use the absolute difference between 0.5 and the vote share of Democrats in state-wide races. This measure fits particularly well in a two-party political system, i.e., when two major parties dominate the electoral scene. In France, political fragmentation is usually high. Besides the two dominant parties (i.e., the left-wing party *Parti Socialiste* and

the right-wing party *Les Républicains*),[21] other political parties such as far-left and far-right, centrist, and green parties play an important role and it is common to have city mayors who belong to one of these non-dominant parties. Consequently, we have to adopt measures of political competition that capture political fragmentation.

Following Laakso and Taagepera [1979] and more recently Ferraz and Finan [2011] and Berliner and Erlich [2015], our first measure is based on the Herfindhal-Hirschman Index (HHI). The *Number of Effective Parties* (NEP) is defined as the reciprocal of the sum of squared vote shares for each party (HHI):

$$NEP_{m,t} = \frac{1}{HHI_{m,t}} \quad \text{where} \quad HHI_{m,t} = \sum_{i=0}^{n} {P_{i,m,t}}^2 \tag{3}$$

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 preceding the date the contract's closure. NEP is an intuitive measure of political concentration and displays a normal distribution whereas HHI is right-skewed. In terms of interpretation, a NEP below 2 corresponds to a single-party domination, while increasing values above 2 reflect the extent to which effective competition is between two or more than two parties.

According to our Proposition 2, we expect that political concentration 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 *Number of Residual Effective Parties* ($NREP$) is defined as the reciprocal of $Residual\_HHI_{m,t}$ in municipality m at time t and allows to

[21] The name of the actual party *Les Républicains* changed many times during the period under study: from *Rassemblement Pour la République*, through *Union Pour la Majorité Présidentielle*, to *Les Républicains*.

measure the strength of political opposition:

$$NREP_{m,t} = \frac{1}{Residual\_HHI_{m,t}} \quad \text{where} \quad Residual\_HHI_{m,t} = \frac{\sum_{j=0}^{n} NWP_{j,m,t}{}^2}{(1 - WP_{m,t})^2} \tag{4}$$

We expect that the more extensive the political opposition, the more rigid the contract.

Finally, a usual way to measure political competition is by the margin of victory of the winning party. We compute $Win\_Margin_{m,t}$ as the difference between the winning party's ($WP_{m,t}$) vote share and the runner-up party's ($RUP_{m,t}$) vote share:

$$Win\_Margin_{m,t} = \frac{WP_{m,t} - RUP_{m,t}}{\sum_{i=0}^{n} P_{i,m,t}} \tag{5}$$

Next, we define *Low Win Margin (bottom quartile)* and *Low Win Margin (<10%)* as dummy variables equal to 1 when the winning margin is in bottom quartile calculated on the all sample and below 10 percent, respectively, and zero otherwise. Thus, these variables capture municipalities with high political competition in the last elections.

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 contract types described in section 3.2: $Operating_{i,t}$, and $Provision\_of\_Services_{i,t}$. In the estimations, provision-of-services contracts are compared to operating contracts through a dummy variable. Because these contractual arrangements correspond to different levels of investment and complexity, we expect provision-of-services contracts to be 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 ($On\text{-}street_{i,t}$, $Underground_{i,t}$, or $Both\_Services_{i,t}$) managed by the contract. The type of service is

orthogonal to the contract types—provision-of-services and operating contracts—thus these variables add to the strength of our analysis.

Third, we control for the possible influence of a corrupted environment on public contracts. The sizable financial flows involved make public procurement particularly susceptible to fraud and corruption. Our variable *Corruption*—obtained from Transparency International France—measures the number of cases of corruption implicating the mayor or a member of the municipal council in the three years preceding the date the contract was signed. This measure is conditional upon corruption cases being detected and prosecuted, which does not necessarily reflect endemic corruption.

Fourth, 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.

Fifth, 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.

Sixth, we include department fixed effects, which take care of omitted variables—e.g., relative bargaining power of the parties in a region, the extent of regional competition through alternative providers, and idiosyncrasies of local demand that could correlate with contract type, like weather.[22]

Seventh, since the estimation results may be driven by unobserved characteristics of the

[22]We cannot use municipality fixed effect because our municipality times series are short and some municipalities only have one contract in place. I.e., the municipality fixed effect would capture the inter-municipal political contestability variation. Departments are the basic administrative jurisdiction in France. At the department level, we have enough time and cross-municipality political contestability variation.

sector, which may evolve over such a long period (24 years), we control for potential biases by introducing year fixed effects corresponding to the year in which the contract was signed.[23]

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:

$$Rigidity_{i,t} = \alpha + \beta Public_{i,t} + \sum_{j} \beta_j \underset{i,t,j}{\mathbb{X}} + \gamma_i + \delta_t + \epsilon_{i,t} \tag{6}$$

where $Rigidity_{i,t}$ refers to our measure 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, γ_i and δ_t are, respectively, departement and year fixed effects, 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:

$$Rigidity_{i,t} = \alpha + \beta Public_{i,t} + \sum_{k} \phi_k \underset{i,t,k}{\mathbb{Y}} + \sum_{k} \psi_k Public \times \underset{i,t,k}{\mathbb{Y}} + \sum_{j} \beta_j \underset{i,t,j}{\mathbb{X}} + \gamma_i + \delta_t + \epsilon_{i,t} \tag{7}$$

where $Rigidity_{i,t}$ is our measure 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.

[23] Contracts tend to become more rigid over time, which may be indicative of a learning process and "red tape" inertia by public administrations, where subsequent arrangements replicate the contractual clauses of previous contracts and add new ones. In unreported regressions, we use a time trend to see whether this learning process (i.e., *cumulative rigidity*) from public administrations could affect our estimates. The results remained qualitatively the same.

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 use 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.

	Public Contracts			Private Contracts		
Duration	N	%	Cumul. %	N	%	Cumul. %
0–2	63	27.0	*27.0*	15	32.6	*32.6*
2–5	73	31.3	*53.3*	21	45.7	*78.3*
5–10	36	15.5	*73.8*	6	13.0	*91.3*
10–35	61	28.2	*100*	4	8.7	*100*
Total	233	100,0		46	100,0	

To address this concern, Model 2 includes contract duration as a regressor and several control variables related to the common history of the contractors. Although *Duration* is positively correlated with the level of contract rigidity, the impact of *Public* remains positive and significant.

The introduction of department and year fixed effects (Models 3 and 4) induces a slight decrease in significance. Publicness, however, remains a driver of higher rigidity: on average,

public contracts display 1.5 standard deviations more rigidity clauses than private contracts.[24]

The remaining control variables provide interesting insights. Provision-of-services contracts are much less rigid (1.7 standard deviations) than operating contracts. Larger parking lots are associated with higher contract rigidity. I.e., the more complex the contract is, the more rigid the contract will be.

Finally, our variable *Corruption* does not seem to have an impact on contract rigidity.

4.1.2 Rigidity by Categories

We analyze contractual rigidity by the categories defined in section 3.4.1. The Welch's t-tests presented in Table 3 indicate that public and private contracts differ significantly in four categories: arbitration, penalties, litigation, and contingencies.

Table 3: This table presents summary statistics of rigidity categories in public and private contracts. In the last column we report the Welch's unequal variances t-test.

	Public Contracts					Private Contracts					T-test
	N	μ	σ	min	max	N	μ	σ	min	max	
Termination	233	1.34	1.61	0	8	46	1.04	1.22	0	5	-1.528
Arbitration	233	24.58	14.25	0	98	46	16.83	26.86	2	137	-3.100
Penalties	233	13.57	8.56	0	68	46	5.96	6.02	0	27	-6.177
Certification	233	7.72	6.47	0	36	46	6.21	8.09	0	40	-0.496
Evaluation	233	18.96	11.10	0	76	46	14.36	21.30	0	110	-1.551
Litigation	233	6.05	3.65	0	22	46	3.09	2.95	0	13	-4.105
Contingencies	233	10.96	6.84	0	39	46	4.83	5.28	0	25	-2.093

To corroborate these results, we run regressions with focus on the contractual rigidity categories (see Table 6). *Public* is positively correlated with four of the seven rigidity categories: arbitration, penalties, litigation, and contingencies.

Control variables in Table 6 also provide interesting insights. The duration of a contract is correlated with two of the seven categories: termination and penalties. It suggests that contracts tend to incorporate more termination and penalties terms when partners commit

[24] Our *zRigidity* variable is the sum of seven z-scores. Thus, the dummy variable *Public* is associated with an average increase of 10.8/7 standard deviations (i.e., the coefficient on *Public* from Table 5, Model 4, divided by the number of rigidity categories) in rigidity search terms.

for a long period. On the other hand, contracts for larger parking lots are associated with more arbitration, certification, evaluation, litigation, and contingency clauses. Consistently with the results on the total level of rigidity, the estimates on rigidity categories imply that rigidity is lower for simpler *Provision_of_Services* than *Operating* contracts.

Overall, our results are consistent with Proposition 1.

4.2 Public Contract Rigidity and Political Contestability

We now turn to investigate how political contestability affects the rigidity of public contracts. We run estimations interacted with the set of political contestability measures defined in section 3.4.3. We start from the fully specified Model 4 in Table 5 and consecutively test our proxies of political contestability on contract rigidity.

Table 7 provides the results. Our models suggest that political contestability affects public contract rigidity, but not private contract rigidity. In line with Proposition 2, the interaction variable $NEP \times Public$ in Model 1 shows that the concentration of political power in a municipality is associated with less contract rigidity.

As previously stated, the NEP 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 interaction $NREP \times Public$ and $zRigidity$ indicates that public contracts are more rigid when the political opposition is extensive.

Similarly, we find a significant relationship between the rigidity of public contracts and the margin of victory in electoral races (Models 3 and 4). Our dummy variables equal to 1 when the winning margin is in the bottom quartile and below 10 percent interacted with *Public* indicate that contracts are more rigid when margins are narrow, i.e., when political contestability is tight.

Results provided in Table 7 confirm the existence of political effects on public contracts,

but not on private contracts. Indeed, none of the political contestability variables affect private contract rigidity. Private contract rigidity seems to be driven solely by the size of the parking lot given by the number of places.

Overall, Models 1–4 lead to results consistent with Proposition 2.

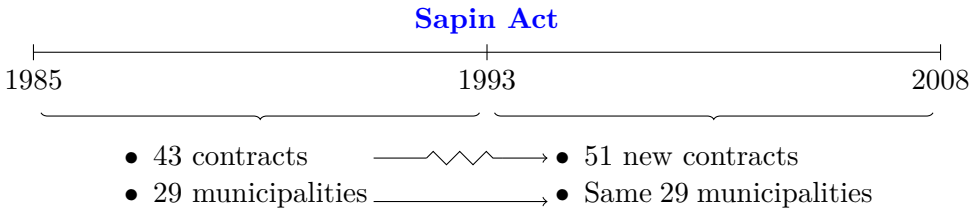
5 Political Oversight: A Natural Experiment

In this section, we utilize a change in the law regarding public scrutiny and transparency of public procurement, and a difference-in-differences approach to show the causal relationship between political scrutiny and contract rigidity.

Before 1993, local authorities were free to choose the company they preferred without any competition, even though in most cases there was a bidding process. The press uncovered and described corruption scandals. These corruption scandals happened in various fields such as waste disposal, water distribution and also public transport. The names of high-level executives of the major corporations involved were made public, and courts sentenced some of them to served jail time. The main focus of the courts was, however, on local elected officials who used their positions to enrich themselves and obtain advantages such as free travels or gifts.

Voted in January 1993, the *Transparency, Anti-Corruption, and Economic Modernization Act* (called "Sapin Act" after the Minister of Finance who championed it) focused on the moralization of public bidding. One of the main consequences of this new legislation was to make the call for bids mandatory and transparent, increasing scrutiny over the way public authorities use public money. Passing the law made municipalities with higher political contestability more vulnerable to challenges from the political opposition. In anticipation, we should expect that newly signed contracts will be more rigid to avoid third-party opportunistic challenges in municipalities that face more fierce political competition.

Figure 1: This figure presents the timeline of difference-in-differences test: the periods before and after the introduction of the Sapin Act and summary statistics of contracts in these periods. The municipalities in the sub-sample had at least one contract signed before, and one new contract signed after the Sapin Act.



Testing whether the Sapin Act impacted differently contractual rigidity depending on political contestability in municipalities is in our case complex for two reasons: (a) provision-of-services and operating contracts last for several years; thus we do not have many observations of municipalities which signed contracts before and after the new regulatory framework and, most importantly, (b) political contestability in one city may change over time.

To circumvent these difficulties, we identify cities for which we have in our sample at least one contract signed before and one contract signed after the Sapin Act was passed. Next, we use longitudinal electoral data to identify cities where political contestability is stable through time, i.e., cities where political contestability is structurally high. More precisely, we consider cities as politically high contestable when either *NEP* is in the highest quartile and *Win_margin* in the lowest quartile for six elections in a raw.

We divide the sub-sample of municipalities into two periods:

(a) From 1985 to 1992 (eight years before the Sapin Act); and

(b) From 1993 to 2008 (16 years after the Sapin Act).

Figure 1 depicts the timeline of the Sapin Act, two periods that constitute our pre- and post-treatment, and the number of contracts in these periods. We identified 29 municipalities that had at least one contract in each period.

Table 8 presents the results from our difference-in-differences estimations. We want to

compare the effect of an exogenous change in the political risk associated with politically contestable municipalities (i.e., high *NEP*, low *Win_margin*). We expect that increased scrutiny should increase contractual rigidity *more profoundly* for politically contestable municipalities than for municipalities whose politicians are not at risk of losing office. In other words, the Sapin Act should not significantly affect public officials' prospects in non-contestable municipalities but should increase public officials' political risk of discretionary contracting in contestable municipalities.

The coefficient of interest is the interaction term of high political contestability variables and Sapin Act, which captures how the outcome of the Sapin Act affected contractual rigidity *differentially* depending on the political risks of losing office. Increasing the political risk associated with discretionary contracts should induce more rigid contracts in politically contestable municipalities (i.e., municipalities where the *NEP* is high and the winning margin is small). The coefficients associated with the high political contestability variables after passing the Sapin Act (the interaction coefficients) show that public officials in politically more contestable municipalities increase the contractual rigidity on average by two standard deviations. In other words, the Sapin Act increased the risk of opportunistic third-party challenges and, as expected, increased contractual rigidity in politically contestable municipalities. This result makes us confident about the causal interpretation of the effect of political contestability on contractual rigidity.

6 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 shown in Tables 7–8, corruption does not play a role in our setting.

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 contractor[25] 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.

Finally, there are other factors which we are not able to control for and which could influence our results, foremost, different demand stochasticity (risk) and corresponding pricing strategies 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 department fixed effects, however, take care of part of this heterogeneity.

7 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

[25]The contractor is the largest car park provider in France.

level of contractual rigidity.

We found that public contracts feature more 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 opponents and interest groups.

Our results suggest that previous empirical studies pointing to the inefficiencies of public contracts related to high renegotiation rates are 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 that investigates the intrinsic properties of public contracts using contracts for the procurement of a standard product with measures of rigidity, corruption, and political contestability, and a clear public versus 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 4: This table presents descriptive statistics of the dependent (*public*), independent, and control variables used in our regression analysis broken by type of contract.

	Operating Contracts N=149				Provision-of-Services Contracts N=130			
	μ	σ	min	max	μ	σ	min	max
Public	0.8	0.4	0	1	0.9	0.3	0	1
zRigidity	6.6	19.0	-23.8	73.6	-3.4	15.4	-27.6	47.5
zTermination	0.9	3.9	-2.5	17.3	-0.5	3.1	-2.5	13.4
zArbitration	1.0	4.3	-4.3	21.2	0.0	3.5	-4.6	16.5
zPenalties	1.2	3.8	-4.7	21.6	-1.5	2.7	-4.7	6.9
zCertification	0.7	3.5	-3.0	16.6	-0.4	3.3	-3.0	16.7
zEvaluation	1.5	4.9	-5.2	26.0	0.1	4.2	-5.4	23.9
zLitigation	0.9	3.6	-4.6	12.8	-0.6	4.0	-4.6	21.5
zContingencies	0.2	3.3	-2.4	15.7	-0.6	2.0	-2.4	10.5
yRigidity	6.5	17.8	-24.0	66.6	-3.2	14.8	-28.0	43.2
Contract Duration	16.8	14.8	1	65	3.6	4.9	1	40
Places	0.1	0.3	0.0	2.3	0.3	2.1	0.0	24.2
Corruption	1.9	1.2	0	9.75	1.8	1.0	0	5.4
Renewed	0.1	0.3	0	1	0.3	0.4	0	1
Inhabitants	10.8	1.4	8.2	14.1	10.2	1.3	8.1	14.0
Left Wing Mayor	0.2	0.4	0	1	0.0	0.2	0	1
Right Wing mayor	0.3	0.5	0	1	0.3	0.5	0	1
On Street	0.2	0.4	0	1	0.5	0.5	0	1
Underground	0.6	0.5	0	1	0.4	0.5	0	1
Both Services	0.3	0.4	0	1	0.1	0.3	0	1
Experience	8.1	11.8	0	42	8.9	11.3	0	43
Past Contracts	3.4	10.7	0	65	2.5	7.2	0	68
Election Participation	0.6	0.1	0.4	0.9	0.6	0.1	0.3	0.8
HHI	0.4	0.1	0.2	0.7	0.4	0.1	0.2	1
NEP	3.0	0.9	1.5	4.8	2.9	0.9	1	4.6
Win Margin	20.4	15.3	0.3	63.4	22.6	19.8	0.2	100
Distance	2.6	1.9	0	6	2.5	1.9	0	6
Residual HHI	0.5	0.1	0.3	0.7	0.4	0.1	0	0.7
Number of Lists	5.1	2.4	2	12	4.5	2.2	1	12
NREP	2.2	0.4	1.5	3.0	2.2	0.4	1.5	3.1

Table 5: This table presents results from panel ordinary least squares (OLS) regressions of the normalized counts (*zRigidity*) of rigidity search terms on procurer type, and contract characteristics and controls. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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%.

	Model 1	Model 2	Model 3	Model 4
Dependent variable		***Contractual Rigidity***		
Public	10.181***	10.516**	9.413*	10.837*
	(3.153)	(4.270)	(5.156)	(5.788)
Provions of Services		-9.087***	-10.666***	-12.009***
		(2.351)	(2.645)	(2.816)
Contract Duration		0.052	0.090	0.263*
		(0.083)	(0.102)	(0.137)
Places		2.629***	2.564***	2.671***
		(0.358)	(0.343)	(0.381)
Corruption		0.285	0.748	0.566
		(0.809)	(0.722)	(1.260)
Controls	No	Yes	Yes	Yes
Department FE	No	No	Yes	Yes
Year FE	No	No	No	Yes
N	279	279	279	279
r^2	0.042	0.206	0.385	0.458

Table 6: This table presents results from panel OLS regressions of the normalized counts ($zCategory$) of search terms by rigidity category on procurer type, and contract characteristics and controls. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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	***Termination***	***Arbitration***	***Penalties***	***Certification***	***Evaluation***	***Litigation***	***Contingencies***
Public	-0.429	2.721*	3.462***	-0.128	2.161	1.605*	1.602**
	(0.836)	(1.391)	(0.708)	(1.246)	(1.724)	(0.879)	(0.674)
Provions of Services	-1.171**	-2.244***	-1.929***	-1.548**	-2.343***	-1.059*	-1.198**
	(0.544)	(0.741)	(0.565)	(0.715)	(0.773)	(0.554)	(0.572)
Contract Duration	0.117***	-0.008	0.089**	0.024	-0.000	0.038	-0.001
	(0.044)	(0.032)	(0.036)	(0.020)	(0.031)	(0.034)	(0.031)
Places	-0.023	0.459***	0.103*	0.308***	1.081***	0.378***	0.354**
	(0.070)	(0.072)	(0.059)	(0.064)	(0.106)	(0.069)	(0.166)
Corruption	-0.356	0.213	-0.110	0.600	-0.038	-0.055	0.329
	(0.218)	(0.289)	(0.369)	(0.501)	(0.341)	(0.281)	(0.205)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Depatment FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	279	279	279	279	279	279	279
r^2	0.429	0.379	0.566	0.326	0.469	0.394	0.343

Table 7: This table presents results from panel OLS regressions of the normalized counts ($zRigidity$) of rigidity search terms on political contestability variables, contract characteristics and controls. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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%.

	Model 1	Model 2	Model 3	Model 4
Dependent variables		***Contractual Rigidity***		
NEP	-1.208			
	(2.591)			
NEP × *Public*	4.405***			
	(1.308)			
NREP		-0.613		
		(4.361)		
NREP × *Public*		5.310**		
		(2.076)		
Low Win Margin (bottom quartile)			-14.099	
			(9.303)	
Low Win Margin (bottom quartile) × *Public*			13.156*	
			(7.542)	
Low Win Margin (<10%)				-15.812*
				(8.070)
Low Win Margin (<10%) × *Public*				15.701**
				(5.935)
Provision of Services	-12.209***	-12.141***	-11.468***	-11.596***
	(2.567)	(2.164)	(3.116)	(2.986)
Contract Duration	0.298	0.292	0.316	0.314
	(0.255)	(0.244)	(0.257)	(0.256)
Places	11.081**	11.295**	12.311**	12.313**
	(4.765)	(4.934)	(5.363)	(5.332)
Corruption	0.130	0.372	0.263	0.084
	(1.563)	(1.678)	(1.559)	(1.699)
Controls	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	259	259	259	259
r^2	0.461	0.452	0.437	0.444

Table 8: This table presents results from difference-in-differences OLS regressions of the normalized counts (*zRigidity*) of rigidity search terms on political contestability variables, contract characteristics and controls for municipalities with low and high political competition which have at least one contract signed before and after the Sapin Act. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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%.

	Model 1	Model 2	Model 3	Model 4
Dependent variables		***Contractual Rigidity***		
High PC	2.128	7.229	-1.070	2.340
	(3.280)	(8.156)	(4.776)	(5.965)
Sapin Act	-0.343	-0.622	-18.302	-2.488
	(4.633)	(7.130)	(12.266)	(9.606)
High PC × *Sapin Act*	15.370**	10.888*	16.283***	14.164**
	(4.704)	(5.423)	(3.367)	(6.026)
Provision of Services	-8.675	-9.747*	-11.825*	-16.365***
	(5.654)	(4.603)	(5.430)	(3.931)
Contract Duration	0.251	0.271	0.197	0.078
	(0.245)	(0.206)	(0.186)	(0.246)
Places	44.267***	42.387**	52.145***	41.132***
	(9.701)	(15.752)	(11.021)	(12.109)
Corruption	0.669	-3.770	0.441	-0.555
	(1.373)	(4.633)	(1.413)	(1.634)
Controls	Yes	Yes	Yes	Yes
Department FE	No	Yes	No	Yes
Year FE	No	No	Yes	Yes
N	94	94	94	94
r^2	0.377	0.559	0.440	0.567

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Appendix A Supplementary Tests

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 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:

$$xArbitration = \frac{Arbitration}{\ln(\text{total number of words})} \qquad yArbitration = \frac{xArbitration - \mu}{\sigma} \tag{8}$$

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, $yRigidity$:

$$\begin{aligned} yRigidity = yArbitration + yCertification + yEvaluation + yLitigation \\ + yPenalties + yTermination + yContingencies + yDesign \end{aligned} \tag{9}$$

Thus, while our measure $zRigidity$ is the sum of normalized counts, the alternative variable $yRigidity$ is the sum of normalized frequencies of search words across our seven rigidity categories. For example, a point estimate equal to seven associated with *Public* implies that, on average, the frequency of use of rigidity terms increased by one standard deviation.

Tables A.1–A.4 correspond to Tables 5–8 in the paper and show that our estimations using our alternative measures $yRigidity$ instead of $zRigidity$ are similar.

Table A.1: This table presents results from panel OLS regressions of the normalized frequencies (*yRigidity*) of rigidity search terms on procurer type, and contract characteristics and controls. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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%.

	Model 1	Model 2	Model 3	Model 4
Dependent variable		***Contractual Rigidity***		
Public	9.382***	9.760**	8.642*	10.085*
	(2.935)	(3.980)	(4.814)	(5.435)
Provions of Services		-8.785***	-10.217***	-11.405***
		(2.244)	(2.536)	(2.698)
Contract Duration		0.055	0.099	0.268**
		(0.081)	(0.099)	(0.132)
Places		2.417***	2.366***	2.458***
		(0.348)	(0.335)	(0.374)
Corruption		0.181	0.496	0.324
		(0.775)	(0.715)	(1.248)
Controls	No	Yes	Yes	Yes
Department FE	No	No	Yes	Yes
Year FE	No	No	No	Yes
N	279	279	279	279
r^2	0.040	0.206	0.383	0.454

Table A.2: This table presents results from panel OLS regressions of the normalized frequencies (*yCategory*) of search terms by rigidity category on procurer type, and contract characteristics and controls. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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	***Termination***	***Arbitration***	***Penalties***	***Certification***	***Evaluation***	***Litigation***	***Contingencies***
Public	-0.521	2.609*	3.377***	-0.170	2.011	1.399+	1.499**
	(0.828)	(1.355)	(0.692)	(1.207)	(1.631)	(0.939)	(0.669)
Provions of Services	-1.113**	-2.149***	-1.836***	-1.478**	-2.233***	-0.950*	-1.137**
	(0.545)	(0.717)	(0.559)	(0.718)	(0.758)	(0.553)	(0.567)
Contract Duration	0.116***	-0.010	0.093***	0.025	0.002	0.038	0.000
	(0.043)	(0.031)	(0.036)	(0.020)	(0.030)	(0.034)	(0.031)
Places	-0.030	0.419***	0.079	0.287***	1.013***	0.345***	0.340**
	(0.069)	(0.072)	(0.058)	(0.064)	(0.106)	(0.069)	(0.169)
Corruption	-0.346+	0.135	-0.195	0.575***	-0.064	-0.114	0.346+
	(0.216)	(0.296)	(0.400)	(0.200)	(0.346)	(0.292)	(0.213)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Depatment FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	279	279	279	279	279	279	279
r^2	0.430	0.377	0.559	0.322	0.468	0.384	0.339

Table A.3: This table presents results from panel OLS regressions of the normalized frequencies (*yRigidity*) of rigidity search terms on political contestability variables, contract characteristics and controls. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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%.

	Model 1	Model 2	Model 3	Model 4
Dependent variables		***Contractual Rigidity***		
NEP	-0.122			
	(2.396)			
NEP × *Public*	4.126***			
	(1.248)			
NREP		0.122		
		(4.244)		
NREP × *Public*		5.012**		
		(1.927)		
Low Win Margin (bottom quartile)			-14.545	
			(9.092)	
Low Win Margin (bottom quartile) × *Public*			13.178*	
			(7.516)	
Low Win Margin (<10%)				-14.624*
				(7.712)
Low Win Margin (<10%) × *Public*				14.410**
				(5.745)
Provision of Services	-11.710***	-11.637***	-10.881***	-11.039***
	(2.428)	(2.108)	(2.980)	(2.851)
Contract Duration	0.301	0.303	0.327	0.325
	(0.225)	(0.227)	(0.240)	(0.239)
Places	10.566**	10.998**	11.920**	11.921**
	(4.557)	(4.822)	(5.159)	(5.148)
Corruption	-0.239	0.174	0.105	-0.083
	(1.679)	(1.655)	(1.552)	(1.688)
Controls	Yes	Yes	Yes	Yes
Department FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	259	259	259	259
r^2	0.468	0.454	0.437	0.444

Table A.4: This table presents results from difference-in-differences OLS regressions of the normalized frequencies (*yRigidity*) of rigidity search terms on political contestability variables, contract characteristics and controls for municipalities with low and high political competition which have at least one contract signed before and after the Sapin Act. Unreported controls include the natural logarithm of the number of inhabitants, dummy variables for underground, on-street, or both parking, the political leaning of the city's mayor (left or right wing) where the parking lot was located, and several variables to account for possible path dependency arising from cumulative knowledge or procedural inertia: a dummy variable for renewed (follow-up) contracts, the difference between the dates that the contract was signed and their first bilateral contract, and the number of all common contracts up to the observation date. 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%.

	Model 1	Model 2	Model 3	Model 4
Dependent variables		***Contractual Rigidity***		
High PC	2.537	7.854	-0.690	2.213
	(3.190)	(7.787)	(4.857)	(6.083)
Sapin Act	-0.066	-0.038	-18.185	-1.719
	(4.572)	(7.055)	(12.034)	(9.886)
High PC × *Sapin Act*	13.433**	9.242	14.355***	12.471*
	(4.510)	(5.523)	(3.191)	(5.764)
Provision of Services	-8.750	-9.926**	-11.928**	-16.904***
	(5.065)	(4.191)	(4.786)	(3.390)
Contract Duration	0.249	0.275	0.195	0.076
	(0.233)	(0.192)	(0.174)	(0.227)
Places	40.576***	38.527**	48.524***	37.428**
	(9.870)	(15.376)	(10.926)	(12.567)
Corruption	0.751	-3.031	0.520	-0.604
	(1.316)	(4.631)	(1.372)	(1.489)
Controls	Yes	Yes	Yes	Yes
Department FE	No	Yes	No	Yes
Year FE	No	No	Yes	Yes
N	94	94	94	94
r^2	0.370	0.558	0.439	0.572