

# Manager identity, relational contracting and the design of public-private agreements

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## Research Article

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# Manager identity, relational contracting and the design of public-private agreements

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## Abstract

This article studies the effect of changes in a private company's management on the design of contracts between this company and public buyers. Based on relational contracting and the hypothesis of substitution between written and unwritten provision, I examine whether previous interactions with current managers lead to less formalized contracts. I use a comprehensive data base of contracts signed between the largest French parking lot operator and a set of municipalities. Several contributions are made. First, the empirical strategy presents a novel approach, avoiding reliance on the total stock of interactions between firm and municipality as a proxy for relational contracting. Second, it provides a new measure of contract rigidity, proposing improvements on previously established ones. Finally, it offers insights on the effects of the institutional environment on relational contracting, by analyzing the mediating effect of awarding procedures and public scrutiny. The main result of this study is that contracts signed with known managers are less likely to include provisions pertaining to penalties and monitoring of the company's activity, potentially indicating the existence of a substitution effect between formal and informal clauses.

*Keywords:* Relational contract ; rigidity ; public procurement ; concession ; manager

*JEL classification:* D23, D73, H57, H76

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# 1 Introduction

The tradeoff between buyer discretion and strict awarding procedures is an essential debate in the design of public procurement policies. Recent contributions include Carril [2022], who studies the effect of a change in the threshold for high discretion procedures on various procurement outcomes and shows that increased discretion may increase quality. Bosio et al. [2022] show in a cross-country study that the effect of increased procurement discretion varies according to institutional parameters: high discretion may improve efficiency, but only in countries with high public sector capacity. On the other hand, Szucs [2023] documents a spike in favoritism following the introduction of a high discretion procurement procedure in Hungary, leading to worsened procurement outcomes.

The rationale behind high discretion procurement policies stems from various theoretical arguments, of which two main examples can be given: the inefficiency of highly formalized auctions in the presence of incomplete contracts [Bajari et al., 2014; Herweg and Schmidt, 2017] and the ability to rely on self-enforcing, relational contracts when repeated interactions are possible [Levin, 2003; Malcomson, 2012]. The latter will be the focus of this paper. The role of relational contracts as a disciplining tool in public procurement has already been the subject of several studies: existing works have documented the effect of relational contracts on adaptation to unforeseen events [Bafundi et al., 2023], on the choice between cost-plus and fixed price arrangements [Corts and Singh, 2004], on bid levels in procurement auctions [Gil and Marion, 2013] and on the choice of an optimal awarding procedure [Albano et al., 2017; Calzolari and Spagnolo, 2020].

This paper contributes to the literature on relational contracting in public procurement by documenting the extent to which relational contracts may help reduce transaction costs through the development of flexible, low rigidity contracts, where some aspects of performance remain unspecified in the written contract. Studies on the private sector have indeed stressed that repeated interaction and the threat of relationship termination may lead to highly informal contracts being viable [Bernstein, 1992; Gil, 2011; Halonen-Akatwijuka and Hart, 2013]<sup>1</sup>. The literature on public contracts has, however, highlighted that, because of their specific nature, public contracts are subject to public scrutiny which may generate incentives to invest in high rigidity, independently from the existence or nonexistence of a relational contract [Spiller, 2009]. Empirical studies confirm that public contracts are indeed more rigid than their equivalent private counterpart [Moszoro et al., 2016], and that said rigidity is increasing in the expected level of public scrutiny [Beuve et al., 2019]. From a

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<sup>1</sup>More generally, a recent literature empirically examines the conditions for existence of relational contracts in various industries, often with a focus on developing countries [Macchiavello and Morjaria, 2015, 2020; Gil et al., 2021; Macchiavello and Morjaria, 2022; Ghani and Reed, 2022; Barron et al., 2020]

policy standpoint, reduced rigidity may be associated with several positive outcomes: higher powered incentives [Spiller, 2009], a decrease in "ink" costs, in bargaining costs, in legal enforcement costs, and most importantly, in renegotiation costs [Beuve et al., 2021]. High reliance on formal clauses, which implies litigation costs in case of breach, monitoring costs to collect proof of said breaches, and contract modification costs, may be a determining factor in the tradeoff between "make-or-buy" for public administrations: the role of transaction costs in deciding between in-house production and delegation is perhaps the oldest finding in organizational economics [Coase, 1937]. It should however be noted that rigidity is not systematically considered to penalize efficiency: Aghion and Hermalin [1990] develop a model in which legal requirements on contracting (e.g. making it compulsory to have a written provision on a specific matter) can force parties to reveal their information and thus improve contractual outcomes.

The goal of this paper is to examine whether relational contracts still play a role in reducing reliance on formal provisions despite the specific institutional constraints associated with public contracting. Because relational contracts are by design unobservable, I use a proxy variable, manager changes, which is expected to affect the extent of relational contracting. Indeed, relational contracts rely on knowledge of the other party's valuation of the relationship. I posit that dealing with an unknown manager introduces uncertainty with regards to the contractor's valuation of the relationship, and thus deters the municipality from extensively relying on relational contracting. The first hypothesis tested is that manager changes reduce reliance on relational contracting, and thus increase reliance on formal clauses, leading to more rigidly written contracts. I test this hypothesis on a data set from the French parking lot sector. To proxy investment in written, verifiable clauses, I construct a text-based measure of contract rigidity. I leverage changes in the identity of company managers to empirically identify disruptions in relational contracts, and I find some evidence that contracts are more rigidly written when public buyers are dealing with managers they have not dealt with in the past, although this result is restricted to a subset of rigidity dimensions, and is interpretable only as a strong correlation, rather than a causal effect due to potential endogeneity.

A second set of hypotheses relates manager changes with the institutional conditions for feasibility of relational contracts in the public sector. Indeed, both strict awarding rules and public scrutiny [Spiller, 2009] prevent reliance on informal contracting in public procurement. The former acts on the credibility of the relationship continuity promise, which is crucial to relational contracts, by potentially allowing competitors to be awarded contracts when the buyer is deprived from discretion. The latter acts on the ability for parties, even if engaged in a continued relationship, to rely on flexible agreements, as gaps in contracts present opportunities for judicial and political challenges by interested third parties.

I thus test the hypothesis that the effect of manager changes is less intense in settings where awarding procedures are highly restrictive, and where public scrutiny (which reinforces the likelihood of third party challenges) are more likely. Results show that the class of contracts which are awarded with high discretion (*délégations de service public* or DSPs, which roughly correspond with concessions) drive the main effect, while *marchés publics* (MP, standard procurement contracts), which are awarded through more formal procedures, appear insensitive to manager changes. Although confounding factors enter into play (MP and DSP contracts differ vastly in many characteristics such as duration, incentive provision and average level of rigidity), these result provide some support to the relational contracting hypothesis. On the other hand, I do not find a significant mediating effect of public scrutiny on the relationship between manager changes and rigidity.

From a policy perspective, this study provides partial support to the idea that high discretion awarding procedures allow parties to economize on transaction costs, through the development of low-rigidity contracts with a relational component. Systematic studies on the matter should however balance out the expected benefits of high discretion (relational contracting, reduction of transaction costs) with its drawbacks (lower competition, corruption). Recent works on the matter seem to indicate that increased discretion, in general, is not necessarily associated with lower performance [Coviello et al., 2018; Decarolis et al., 2020; Carril, 2022], especially when it comes to developed countries [Bosio et al., 2022]. This paper also supports the idea that public administrations should form partnerships with companies characterized by stable management, allowing for the development of relational contracts. While managerial stability has been identified as a source of efficiency within public organizations [Meier and O’Toole, 1999, 2007, 2011], little evidence exists on the effect of managerial stability within private partners of public organizations.

The welfare implications of reduced rigidity remain to be estimated precisely by further works. From a theoretical standpoint, Spiller [2009] underlines that rigidity leads to “difficulties in adapting to shocks and [...] to low-powered incentives”. Concerning the adaptation issues, there is evidence of increased renegotiation likelihood in the presence of high rigidity [Beuve et al., 2021]. Regarding the incentive aspect, there is to this day no empirical evidence on the fact that rigidity generates productive inefficiencies. Future work should attempt to relate rigidity with outcomes indicating the quality of the procurement relationship, such as realized costs compared with an expected costs. Additionally, it should be recalled that the focal point of Spiller [2009]’s analysis is in fact to justify that high rigidity is rational in the presence of government and third party opportunism. A fully fledged analysis of relational contracting and rigidity should thus measure both the productive benefits of low rigidity and its costs in terms opportunism.

The paper is structured as follows. Section 2 presents the theoretical framework relating

repeated interactions with lower rigidity. Section 3 describes the data collection process. Section 4 presents the empirical evidence for the role of repeated interactions with managers and decreased rigidity, as well as the interplay of relational contracting with institutional factors. Section 5 discusses alternative channels and welfare implications of the results. Section 6 concludes.

## 2 Literature and testable hypotheses

### 2.1 Relational contracting, manager identity and contract rigidity

**Relational contracts and reliance on formal clauses.** An essential question in this work is whether the existence of relational contracts reduces investment in written clauses. In the presence of a relational contract, rigidly planning out performance generates transaction costs that may be unnecessary if the appropriate level of performance can be enforced through a self-enforcing agreement, explaining [Macaulay \[1963\]](#)’s fundamental finding that business relationships rely only marginally on written contracts. These transaction costs include ”ink” costs of writing the contract *ex ante*, but also the costs associated with renegotiating the provisions if the initial clauses are not adapted to the state of the world. Indeed, under a flexible, relational agreement, performance details can be specified in real time and do not require modifications of the formal contract. From a microeconomic perspective, [Kvaloy and Olsen \[2009\]](#) present a relational contracting model where the principal may invest in written clauses which allow performance to be verifiable in court with some probability. When considering a quadratic transaction cost function, they show that trust (proxied by a high discount factor) decreases the optimal level of investment in written clauses, thus showing a substitution effect between written clauses and the extent of relational contracting. The third party opportunism (TPO) literature makes a similar assumption, although approached negatively: works such as [Beuve et al. \[2019, 2021\]](#) consider that rigidity in public contracts are indicative of the absence of implicit contracts, and that informal adjustment mechanisms are replaced by formal renegotiations. Additionally, a literature relying on behavioral assumptions supports the idea that rigid contracts may generate distrust [[Ghoshal and Moran, 1996](#); [Fehr and Gächter, 2000](#)], thus going in the direction of a substitution effect between written contract and informal agreements.

However, the relationship between formal and relational contracts is not purely monotonic, i.e. relational contracts are not systematically associated with less reliance on formal contracts<sup>2</sup>. From a theoretical perspective, a strand of the literature has insisted on the

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<sup>2</sup>A survey of the formal *versus* informal contracting literature is provided in [Gil and Zangarone \[2017\]](#)

necessity of some formal provisions to make relational contracts enforceable: this is the case in Klein [2000], where the formal contract acts on the cooperation constraint of the relational contract by modifying the profits obtained from deviation. From an empirical point of view, various works show that written provisions may remain important in the presence of relational contracts. Frydinger et al. [2019] and Frydinger and Hart [2023] provide evidence that guiding principles are essential to support relational contracts based on reference points. Bernstein and Peterson [2023] argue that in supplier-manufacturer relationships, strict written clauses remain necessary despite some provisions being enforced informally. Specifically, they show the importance of "managerial" provisions, that is "contract administration mechanisms that support them have the potential to increase the likelihood that cooperative contracting relationships [...] arise and endure." Some studies find that repeated interactions increase the level of contractual detail [Poppo and Zenger, 2002; Vanneste and Puranam, 2010]. It should be noted that the effect of repeated interactions in Vanneste and Puranam [2010] concerns the level of technical detail: legal detail, on the other hand, decreases as party repeatedly interact, a finding consistent with the idea that legal monitoring decreases with relational contracting.

This article contributes to the debate on substitutability versus complementarity of formal and informal provisions, by studying the effect of a proxy for relational contracting on the contract rigidity.

**Manager identity and relational contracting.** This article builds on the assumption that manager changes can be used as a proxy for disruptions in relational contracts. An essential feature in relational contracts is the fact that parties value the relationship sufficiently to comply with the unwritten terms of the agreement. Theoretical models show that certainty about the other party's valuation of the relationship is crucial: Halac [2011] writes that "uncertainty about a firm's prospects can render relational contracts ineffective." This paper questions whether changes in the identity of the manager a municipality is dealing with may disrupt relational contracts. The study of the role of managers in relational contracts is a rather novel topic in research. It has been investigated theoretically by Troya-Martinez and Wren-Lewis [2022]. One of the key findings of this study is that when engaged in a relational contract, the manager of the supplying company may collude with the buyer, and that this collusion may enhance the incentives of the seller to provide adequate performance. Although I do not assume necessary collusion between the manager and the municipality for the relationship, I argue that time may be necessary to build trust and learn about the manager's valuation of the relationship, and their potential will to comply with a relational contract. One can thus assume municipalities to be more willing to rely on relational terms when dealing with managers they have already interacted with in the past. The phenomenon of gradual learning about preferences is described in studies such as Watson [1999], where

parties progressively increase the stakes of the relationship as they learn about each other’s valuation of this relationship. Empirical studies on the effects of manager changes and manager identity on relational contracts remain scarce. Although not directly related to this study, [Natividad \[2024\]](#) finds that manager deaths reduce credit performance, a finding which could potentially be related to relational contracts with lenders.

Two theoretical intuitions are hence the starting point of our work: first, relational contracts reduce reliance on written clauses. Second, dealing with an unknown manager reduces reliance on relational contracts. Combining both statements leads to an empirical hypothesis:

**Hypothesis 1.** *Contract rigidity is higher when a municipality has not dealt in the past with current company managers.*

This hypothesis imposes an exclusion restriction, i.e. that the effect of manager changes on rigidity stems only from relational contracting. An alternative explanation to the fact that rigidity varies with manager identity could be that certain managers are prone to writing more/less rigid contracts. To answer this remark, it should first be stressed that managers in large companies are rarely in charge of directly drafting contracts, which reduces the plausibility of such an effect. I assume that the effect of manager changes on rigidity comes not from the company side, but primarily from reduced trust on the municipality side, who demands more guarantees, or ”safety nets” through rigid contractual clauses. Indeed, a procurement contract is primarily an agency relationship where the public authority is the principal, and has more interest in strictly monitoring the contractor’s behavior. In addition, the use of time fixed effects allows to control for general firm level trends in the way contracts are written, thus controlling for any general change in the contracting strategy of the company associated with the identity of managers. The idea that rigidity is primarily demanded by the municipality also explains why the hypothesis is framed subjectively: I consider that trust in the company stems from the bilateral history with manager(s), but not from total manager history. In other words, I do not consider reputational spillovers from the manager’s behavior in contracts with other municipalities. Alternative theoretical channels explaining the link between manager identity and contract rigidity are discussed more thoroughly in Section 5.

## 2.2 Institutional determinants of relational contracting

In public procurement, the feasibility of relational contracting may be highly restricted by regulations and by the public nature of buyers. Pure relational contracting is in general not available: [Beuve and Saussier \[2025\]](#) write that ”to rely on relational contracts in the public

domain is more complicated than in the private one, if not unfeasible”. There is however evidence of relational dynamics in public procurement, occurring through the choice of high discretion awarding procedures when available [Bafundi et al., 2023], through renegotiation as a means of preserving the continuation of the relationship [Beuve and Saussier, 2021], or through the bundled award of various public services to a single operator [Desrieux et al., 2013]. A fundamental assumption made in this paper is that public procurement still leaves space for informality, as some types of clauses may be included or not at the discretion of the contracting parties. As will be exhibited in the empirical part, there is variability in the amount of legal monitoring occurring, be it on the planning of judicial procedures, the planning of penalties and remedies in case of breaches, the amount of reporting that operators must perform, etc. Moreover, despite papers such as Beuve et al. [2019] arguing against relational contracting in the public sector, the variability that their rigidity scores exhibit also testify of the existence of a ”relational space”, i.e. parts of agreements that may be left unwritten at will.

This study tests whether the institutional factors which are expected to relational contracting play a mediating role in the relationship between manager changes and rigidity. Indeed, the feasibility of relational contracting in the public sector is conditioned by several elements. First, some freedom of choice in the identity of the contracting firm is necessary for the promise of continuation of the relationship to be credible. Because the awarding procedure for DSP contracts is more lenient than for MP contracts, and generally more negotiation based, it is expected that the ”relational” effect of manager changes is driven by DSP contracts rather than standard procurement deals (MP contracts):

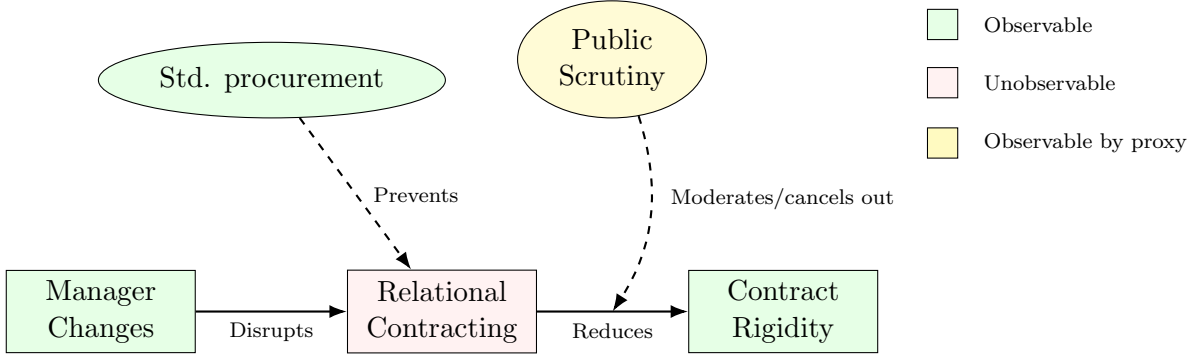
**Hypothesis 2.** *The effect of manager identity on contract rigidity is stronger for DSP contracts than for MP contracts.*

Additionally, the third party opportunism (TPO) framework has stressed the fact that public contract rigidity is not only driven by characteristics of the bilateral relationship (such as the existence of an implicit agreement), but also by the likelihood of third party challenge. Specifically, under high public scrutiny, the risk of third party opportunism is expected to impose the use of highly rigid agreements, making relational contracting impotent [Spiller, 2009; Moszoro and Spiller, 2014, 2019; Cavalieri, 2025]. Following Moszoro and Spiller [2019] and Beuve et al. [2019], political contestability is used to proxy the risk of third party challenge, and is thus expected to reduce the effect of manager identity on rigidity:

**Hypothesis 3.** *The effect of manager identity on contract rigidity is stronger for cities undergoing low political contestability.*

The theoretical framework tested in this study is summarized in figure 1.

**Figure 1:** Theoretical framework: visual summary



*Source: Author.*

## 3 Data

### 3.1 General presentation of the data

The initial database is comprised of 471 contracts between French municipalities and a single firm, for the construction and/or operation of parking lots. Two main types of contracts are to be distinguished. "*Marchés publics*" (MP) contracts, are usually short term contracts concerned only with the operation of parking lots, where the demand risk is borne by the buyer (the municipality). "*Délégations de service public*" (DSP) are long term contracts that may govern both the construction and operation of the parking lot (in which case they are called concessions), usually long term and where the operator bears all or part of the demand risk. We argue that MP contracts are less prone to the identification of a relational effect since they are much shorter, and regulated by stricter procedures. DSP contracts last on average 26.12 years while MP contracts last on average 2.89 years: it is clear that DSP contracts are more prone to the emergence of relational contracts. Finally, and most importantly, MP contracts are governed by strict procurement regulations which generate (at least in theory) much less discretion in the awarding procedure.

### 3.2 Rigidity scores

**Construction of the dictionary.** The set of rigidity variables is based on a dictionary of search terms, which was constructed upon reading a set of contracts and identifying recurring

terms which indicated strict monitoring of quality, delays, as well as legal remedies in case of breach of the contract. In total, eleven rigidity categories are defined. "Penalties" deals with the financial sanctions imposed by the municipality in case of contractual failure on the contractor side. "Faults" contains terms pertaining to noncompliance of the contractor to provisions. "Termination" deals with the instances where the contract is terminated before its planned term. "Delays" concerns delays in construction. "Quality" contains a list of terms indicating that the municipality exercises oversight over the contractor's behavior in order to meet certain quality standards. "State of infrastructure" contains terms relative to the physical qualities of the infrastructure. "Litigation" concerns words which pertain to judicial procedures. "Revision" contains clauses dealing with the renegotiation process, indicating formal tools to adapt the contract (thus excluding informal adjustments). "Authorizations and permits" deals with instances where the contractor requires administrative approval to conduct a specific task, indicating strict oversight. "Monitoring" contains terms pertaining to reporting that must be performed by the contractor, also indicating strong oversight. Overall, these search terms are designed to capture lack of trust, reliance on written tools and on court enforcement of strictly monitored provisions. This dictionary and the categories differs from the one in [Beuve et al. \[2019\]](#) but remains close to its general spirit. Table 1 presents the dictionary of search terms used.

**Computation of rigidity scores.** The rigidity score built here attempts to correct some of the shortcomings of the [Beuve et al. \[2019\]](#) approach, which relies on the normalized frequency of search terms<sup>3</sup>. Two main issues can be put forth. First, the use of term frequencies leads to rigidity scores being decreasing in contract length: a 1-page contract containing one rigidity term is considered equivalent to a 10-page document containing 10 rigidity terms. This correction fails to capture the fact that contractual rigidity is likely to be correlated with contract length. Another shortcoming is that all occurrences words in a dictionary category have the same contribution to rigidity. I attempt to adopt a more granular approach. First, I seek to build a rigidity score which gives more weight to rare terms, i.e. terms that do not appear in many documents. Intuitively, the idea is that if a term is present in every document, it is unlikely to be a powerful way to discriminate between rigid and flexible contracts. A second criteria is that repeated occurrences of a term within a contract should not have the same weight: I assume that the marginal contribution of a word to total rigidity is decreasing in the number of occurrences of this word. I thus seek to build a rigidity score satisfying the following properties:

- Rigidity scores are not mechanically decreasing in contract length

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<sup>3</sup>[Beuve et al. \[2019\]](#) also use a different dictionary and set of categories, although both dictionaries are closely related.

**Table 1:** Search terms for rigidity (translated from French)

| Category                   | Search terms                                                                                                                                             |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Penalties                  | penalties, penalty, fine, sanctions, sanction, penalization, coercive measure, coercive measures                                                         |
| Faults                     | failure, failures, defaulting, default, misconduct, serious misconduct, neglect, negligence, complying, comply, seriousness, harm, harms, non-compliance |
| Termination                | termination for fault, terminated for fault, formal notice, temporary suspension of contract                                                             |
| Delays                     | delay, delays, late                                                                                                                                      |
| Quality                    | control, controls, guarantee, guarantees, checks, check, quality, safety                                                                                 |
| State of infrastructure    | <i>état des lieux</i> <sup>a</sup> , deteriorate, deteriorated, deterioration, perfect state, repair, repairs                                            |
| Caretaking                 | visit, cleanliness, hygiene, caretaking, waste, sweeping, cleaning                                                                                       |
| Dispute                    | challenge, challenges, dispute, disputes, court, jurisdiction, litigation                                                                                |
| Revision                   | revision of conditions, revision of provisions, revised, renegotiation, renegotiate, renegotiated, contract modification                                 |
| Authorizations and permits | authorization, authorizations, approbation, permit, permits                                                                                              |
| Monitoring                 | statement, statements, report, statistics, information                                                                                                   |

<sup>a</sup> The word *état des lieux* refers to an inspection visit, generally at the term of a contract, to ensure the infrastructure is in good state.

*Note:* Search terms which share the same semantic root (i.e. plurals, variation in tense or gender, adjectives/adverbs/verbs drawn from the same noun) are considered as a single term for the calculation of frequencies.

- Rarer terms contribute to rigidity more than frequently used terms
- The marginal contribution of each occurrence of a term is decreasing in the number of occurrences of the term within a document

TF-IDF (term frequency - inverse document frequency) [Jones, 2004] is a text analysis tool designed to attribute scores to words according to their salience, i.e. how distinctively they characterize a document compared to others. For a given term, the TF-IDF score is computed by multiplying the frequency of the term within the document (TF, text frequency) by the logarithm of the inverse document frequency (IDF, the document frequency being the share of documents which contain a given word). The TF part gives a premium to words

that are intensely used within a document, while the IDF part rewards words that are used in a small number of documents. Thus, a document has a high TF-IDF score for a given term if the term is mentioned frequently within the document, and appears in a small number of documents. Conversely, a search term has a low score in a document if it seldom appears in this document and/or if it appears in a large number of documents.

TF-IDF captures some dimensions that satisfy the criteria mentioned above. The IDF dimension allows to put a premium on distinctive terms which do not appear in many documents, while terms which appear in every documents do not contribute to the final score, allowing to discriminate between contracts. The TF part on the other hand poses similar problems to the [Beuve et al. \[2019\]](#) normalized frequency score: it imposes a penalty on longer documents, as the number of occurrences of a term within a document is divided by the total number of words within the document. I thus modify the TF part to make a term count (TC), meaning that for a given number of occurrences, a search term will contribute to rigidity with the same intensity regardless of the length of the document. I however assume that the marginal contribution of each occurrence of a given term to rigidity is decreasing (i.e. the "additional" rigidity that a contracts get by shifting from 0 to 1 occurrence of a word is larger than the additional rigidity that it gets by shifting from 19 to 20 occurrences of the word). Thus I transform the term count by taking its natural logarithm and adding one (here the  $\log(x + 1)$  function is simply an arbitrary function which is increasing and concave over  $[0, +\infty]$ ). The score attributed to a search term in a given document is now a "log of (term count + 1) - inverse document frequency" (LTC-IDF) score which is computed as such:

$$LTC\_IDF_{i,t} = \log(TC_{i,t} + 1) \cdot IDF_t$$

where TC is the number of occurrences of term  $t$  in document  $i$ , and IDF is the log of the inverse of the share of documents which contain the given term. The rigidity score that a contract  $i$  gets for a given category  $c$  is then the sum of the  $LTC\_IDF$  scores of the terms  $t$  (with  $T$  the number of terms in the category) for this given contract:

$$RigidCat_{i,c} = \sum_{t=1}^T LTC\_IDF_{i,c,t}$$

Finally, for a given contract, the category-specific rigidity scores are aggregated into a general rigidity score. The category scores are first normalized using a z-transformation (subtracting the mean and dividing by the standard deviation) so that category-specific scores use the same scale. Then I use the sum of each of the 11 category-specific rigidity score to obtain a general rigidity score for each contract:

$$RigidGen_i = \sum_{c=1}^{11} \left( \frac{RigidCat_{i,c} - \overline{RigidCat_c}}{StdDev(RigidCat_c)} \right)$$

where  $\overline{RigidCat_c}$  is the mean of  $RigidCat$  across contracts and  $StdDev(RigidCat_c)$  is the standard deviation of this same variable across contracts.

### 3.3 Manager identity

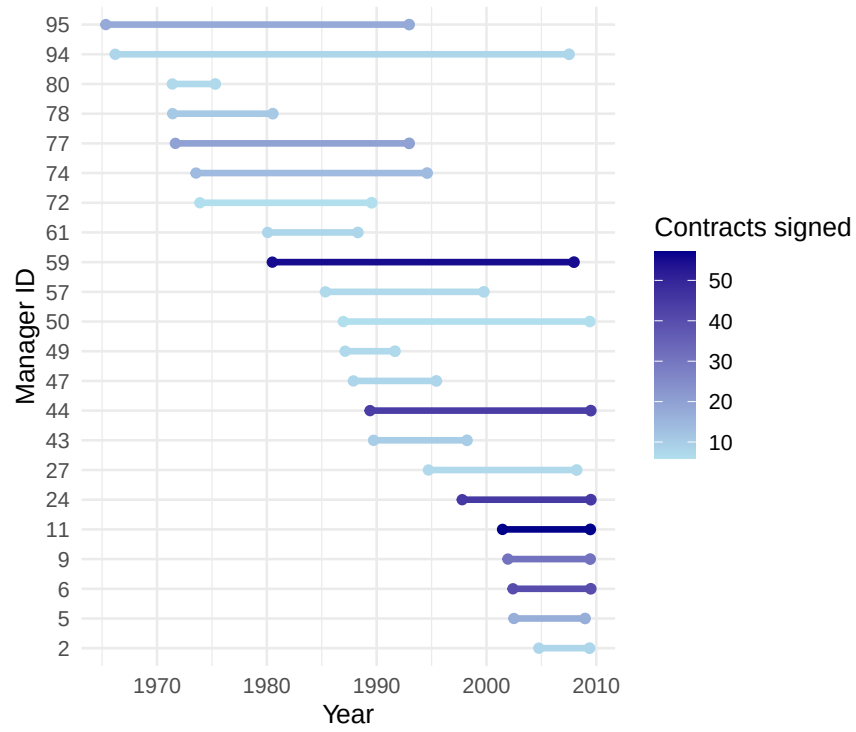
In order to identify changes in management of the operating company, I collected the names of the individuals who signed each contract on behalf of the company. These were available for all contracts, excepting very few exceptions which I eliminated from the data. In general, according to the title associated with their names, they are either the national CEO of the company, or the head of a regional branch when the firm has been divided in several subnational entities. Figure 2 displays the time span between the first and last contracts signed by each manager who signed over 5 contracts. It appears that there may be multiple signers at the same time, which can be explained by two factors. The first reason for this is that a single contract may be signed by multiple managers, including the regional branch manager and the national CEO. Moreover, different managers may be in charge of different types of contracts. Another reason is that the company we observe in 2009 has undergone many structural changes, and is the result of mergers between various companies whose managers were the signers of the initial contracts.

I then derive a categorical variable *Manager* from the data collected. This variable takes three values: *FirstContract* if the contract is the first in the city-company history, *Unknown* if the municipality has already signed a contract with the company, but never with the current set of signing managers and *Known* if the municipality has signed a contract with at least one of the current signing managers. I distinguish *FirstContract* from *Unknown* because *FirstContract* is correlated with total experience between parties, and may induce confusion between the effects of knowing a manager and the effect of the city-company relationship length overall. One of the shortcomings of this variable is that the data collection process has not allowed the systematic identification of different manager types. While sometime, information is available about the exact position of the manager, in many cases it is not. I thus rely on a simplified variable, which considers all manager to have equivalent statuses.

### 3.4 Public scrutiny

I use proxies for public scrutiny in order to obtain a measure of how likely third party challenges of the contract are. I use two primary measures. First, I use the number of

**Figure 2:** Manager tenure and number of contracts signed



*Note: This figure plots the timespan over which each manager name is observed in the data. Colors indicate the number of contracts signed over this timespan. Source: Author.*

effective parties (NEP) [Beuve et al., 2019], which is designed to capture the number of sizable competing parties in the first round of municipal elections. It is computed by taking the inverse of the Herfindahl-Hirschmann Index (HHI), which captures political concentration (i.e. the monopoly-like feature of an election) in the latest municipal election before the contract was signed :

$$NEP = \left( \sum_{i=1}^N s_i^2 \right)^{-1}$$

where  $s_i$  denotes the vote shares of party  $i$  and  $N$  is the total number of parties in the first round. For each contract, the NEP is calculated with the results of the first round of the most recent municipal election. Because Paris, Lyon and Marseille have specific administrative features (the mayor is elected indirectly, and these cities are divided in districts, (*arrondissements*), which all have their individual mayors), they are excluded from the sample when the NEP is used.

A secondary proxy for public scrutiny is the timing of the contract with respect to elections. Municipal elections in France are held nationally every 6 years around March and April. I posit that contracts signed prior to a municipal election are subject to more risks of politically motivated challenges, given that the returns from destabilizing the mayor in office for political opponents are higher during an electoral campaign. I use a pre-election dummy variable which takes value 1 if the contract was signed within 12 months before the first round of a municipal election.

### 3.5 Control variables and fixed effects

The main empirical challenge of this work is to control for confounding factors which may affect rigidity, independently from manager identity. Most importantly, I control for the type of contract (MP *versus* DSP) as well as for whether the contract involves construction, operation or both. At the contract level, I also control for duration of the contract, number of slots in the the parking lot, total experience between parties prior to the contract (both expressed in years and number of contracts), whether the contract has ended or not, whether the contract was renewed or not, and whether the parking lot is underground or not.

Concerning time and city level heterogeneity, the size of the sample limits the use of fixed effects. Regarding time, I use half-decade fixed effects to control for the long term dynamics of contract writing style rather than year fixed effects, as it is not infrequent that there are one single contract for a given year, or a very small number. Because time variables may also capture heterogeneity in the type of contracts (there are much more MP contracts in

the 2000s), I interact the time fixed effects with type of contract. In order to control for heterogeneity between cities, I use a set of city level control variables: municipal population at the closest census, political leaning of the city, a Transparency International corruption perception index for French municipalities.

I also control for manager characteristics using total manager tenure, which is proxied through the first appearance of the manager in the data. In the case where multiple managers signed the contract, I use the tenure of the longest standing one.

## 4 Empirical strategy and results

### 4.1 Empirical strategy

The first hypothesis concerns the general effect of manager changes on contract rigidity. To test Hypothesis 1, the following equation is estimated:

$$Rigid_{i,c,t} = \beta_1 Manager_{c,t} + \beta_2 X_{i,c,t} + \beta_3 Z_{c,t} + \gamma_{t,k} + \varepsilon_{i,c,t} \quad (1)$$

Subscripts  $i, c, t, k$  denote respectively contract, city, time and type (i.e. concession or standard procurement) of the contract. *Rigid* is a rigidity score indicating reliance on written clauses. *Manager* is a categorical variable taking 3 values: *FirstContract* if the contract is the first in the city-company history, *Unknown* if the contract is not the first in the city-company history but is signed only by managers which the city has not dealt with in the past, and *Known* if the contract is signed with at least one manager that the city has interacted with in the past. Vector  $X$  contains contract level control variables: the number of lots in the parking lot, the duration of the contract, rank of the contract in the city-municipality relationship, previous years of experience between parties, tenure of the longest standing manager among those signing the contract, whether the contract was renewed or not, whether the contract has ended before or after the observation span, whether the parking lot involves underground parking, and whether the contract involves construction and operation or only operation (in the case of concession contracts). Vector  $Z$  contains city  $\times$  time specific control variables: log of municipal population (at the closest census in time) the political leaning of the mayor in office, the Transparency International municipal corruption index. Finally, type-specific time fixed effects  $\gamma_{t,k}$  are included. The reason for the interaction of time fixed effects is that the distribution of types is strongly biased in time (the gist of standard procurement contracts were signed in the 2000s), meaning that simple time fixed effects would capture variation in the type of contract, which are strong predictors of contract rigidity. City fixed effects are not included in the main specification

**Table 2:** Descriptive Statistics

| Variable                     | N   | Min    | Max     | Mean      | SD        |
|------------------------------|-----|--------|---------|-----------|-----------|
| <b>Rigidity scores</b>       |     |        |         |           |           |
| General                      | 415 | -13.58 | 19.87   | 0.62      | 6.66      |
| Revision                     | 415 | 0      | 3.81    | 0.20      | 0.46      |
| Caretaking                   | 415 | 0      | 9.95    | 2.68      | 1.88      |
| Faults                       | 415 | 0      | 8.87    | 2.56      | 1.52      |
| Disputes                     | 415 | 0      | 6.86    | 1.90      | 1.44      |
| Penalties                    | 415 | 0      | 5.88    | 1.95      | 1.43      |
| Termination                  | 415 | 0      | 0.599   | 0.238     | 0.155     |
| Authorizations and permits   | 415 | 0      | 3.96    | 1.36      | 0.99      |
| Quality                      | 415 | 0      | 2.28    | 0.93      | 0.41      |
| Delays                       | 415 | 0      | 0.79    | 0.35      | 0.17      |
| State of infra.              | 415 | 0      | 1.55    | 0.59      | 0.38      |
| Monitoring                   | 415 | 0      | 6.51    | 1.15      | 1.08      |
| <b>Explanatory variables</b> |     |        |         |           |           |
| Manager: Known               | 421 | 0      | 1       | 0.31      | 0.46      |
| Manager: Unknown             | 421 | 0      | 1       | 0.30      | 0.46      |
| Manager: First contract      | 421 | 0      | 1       | 0.39      | 0.49      |
| Type: DSP                    | 421 | 0      | 1       | 0.64      | 0.48      |
| Type: MP                     | 421 | 0      | 1       | 0.36      | 0.48      |
| NEP                          | 351 | 1      | 4.67    | 2.83      | 0.90      |
| PreElection                  | 421 | 0      | 1       | 0.18      | 0.39      |
| <b>Control variables</b>     |     |        |         |           |           |
| Manager tenure               | 419 | 0      | 41      | 7.96      | 7.38      |
| Duration (years)             | 421 | 0.15   | 65      | 17.89     | 15.49     |
| Year                         | 421 | 1963   | 2009    | 1996.14   | 12.20     |
| Construction                 | 421 | 0      | 1       | 0.29      | 0.45      |
| Slots                        | 412 | 20     | 23481   | 1020.05   | 1904.21   |
| Experience (years)           | 421 | 0      | 46      | 9.49      | 11.95     |
| Experience (contracts)       | 421 | 0      | 74      | 5.71      | 13.08     |
| Renewed                      | 421 | 0      | 1       | 0.14      | 0.35      |
| Ended                        | 421 | 0      | 1       | 0.24      | 0.43      |
| Underground                  | 421 | 1      | 3       | 1.93      | 0.63      |
| Population                   | 414 | 363    | 2790091 | 412320.73 | 799978.53 |
| Left                         | 421 | 0      | 1       | 0.11      | 0.31      |
| Right                        | 421 | 0      | 1       | 0.23      | 0.42      |
| Corruption                   | 421 | 0      | 14.41   | 2.04      | 1.44      |

but are included as robustness checks in the appendix. Estimation is performed via OLS. Given that the treatment variable *Manager* is clustered at the time  $\times$  city level (there is

potential geographical heterogeneity in the identity of managers for two contracts signed in the same year), I use cluster robust standard errors at the time  $\times$  city level.

Hypotheses 2 and 3 aim at identifying moderating factors in the effect of manager changes on contract rigidity. To test hypotheses 2 and 3, the *Manager* treatment is interacted successively with contract type and with political contestability, which indicates the likelihood of third party challenges:

$$Rigid_{i,c,t} = \beta_1 Manager_{c,t} + \beta_2 (Manager_{c,t} \times Type_{i,c,t}) + \beta_3 X_{i,c,t} + \beta_4 Z_{c,t} + \gamma_{t,k} + \varepsilon_{i,c,t} \quad (2)$$

$$Rigid_{i,c,t} = \beta_1 Manager_{c,t} + \beta_2 (Manager_{c,t} \times Contest_{c,t}) + \beta_3 X_{i,c,t} + \beta_4 Z_{c,t} + \gamma_{t,k} + \varepsilon_{i,c,t} \quad (3)$$

Apart for the inclusion of interaction terms, the specifications are identical as the one used to test Hypothesis 1.

Two main concerns regarding endogeneity emerge. First, manager changes may be endogenous to relational contracts: misconduct of a manager through violation of a relational agreement may lead to manager dismissal. On the contrary, the potentially collusive behavior associated with relational contracting could also lead the company board to remove the manager. Second, manager changes can also be assumed to be endogenous to public scrutiny: a manager engaging in relational contracting may be sanctioned through judicial challenges by interested third parties, and forced to resign due to public pressure. In this case, public scrutiny as a confounding factor would only lead to more conservative estimates. Indeed, assuming that public scrutiny is positively correlated with the likelihood of manager change, then the coefficient associated with manager changes in the main equation is necessarily smaller than the one associated with only "exogenous" manager changes.

An additional criticism concerns the exogeneity of contract type assumption. This critique can be relatively easily discarded given that standard procurement and concession contracts generally answer very different needs, as is showcased by the difference in average duration between both types of contracts (26.5 years for DSP contracts against 2.7 years for MP contracts).

## 4.2 Results: Manager changes and contractual provisions

**Main specification.** Table 3 presents the results for Hypothesis 1 using the dictionary based proxies for rigidity. The main coefficient of interest is the one associated with variable *Manager\_Unknown*. The general effect on rigidity is nonsignificant. However, we observe a significant effect, in the expected positive direction, concerning clauses dealing with penalties, monitoring and state of the infrastructure. These results point towards a relational effect,

wherein unknown managers are monitored more strongly, and formal remedies are more likely to be planned out in case of breach, consistent with a theory that manager changes represent disruptions in relational contracts.

**Robustness checks.** A set of robustness checks are performed in the Appendix section. When removing Paris from the sample (table 8), the result on the "State" rigidity score remains significant while the result on "Penalties" loses significance. Other coefficients are not affected. When including city fixed effects rather than city level controls, our coefficients lose significance, potentially due to oversaturation of the model given the small size of the sample considered. When using the [Beuve et al. \[2019\]](#) scores we do not observe significant effects (table 13), despite the strong correlation between both variables (see figure 5). Although these robustness checks do not contradict our initial results, they show that coefficients generally lose significance when imposing additional constraints on the specification or on the sample.

**Endogeneity concerns.** Manager changes may be endogenous to relational contracts, if one considers the case where misconduct of a manager in a relational contract leads to this manager being dismissed. I assume that such effects would be more likely to occur in large cities: a small municipality is unlikely to dictate strategic changes in the operating company. Thus, to check whether such effects enter into play, I interact the "Manager" variable with a dummy indicating whether the city contains less than 60,000 inhabitants (which roughly corresponds with the median population). Results do not indicate that our main effect is significantly smaller in low population cities, making the endogeneity of manager changes an unlikely driver of the main result.

**Table 3:** Results for Hypothesis 1: Manager changes and contract rigidity

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)        | Disputes<br>(6)   | Penalties<br>(7)     | Permits<br>(8)     | Quality<br>(9)    | Delays<br>(10)     | State<br>(11)        | Monitoring<br>(12) |
|--------------------------------|-------------------|-------------------|-------------------|--------------------|---------------------|-------------------|----------------------|--------------------|-------------------|--------------------|----------------------|--------------------|
| <i>Variables</i>               |                   |                   |                   |                    |                     |                   |                      |                    |                   |                    |                      |                    |
| Manager_Unknown                | 0.822<br>(0.871)  | -0.016<br>(0.088) | 0.195<br>(0.261)  | -0.022<br>(0.016)  | -0.145<br>(0.190)   | -0.102<br>(0.160) | 0.311**<br>(0.149)   | -0.030<br>(0.094)  | -0.009<br>(0.053) | 0.038*<br>(0.022)  | 0.153***<br>(0.053)  | 0.282**<br>(0.136) |
| Manager_FirstContract          | -0.114<br>(1.37)  | 0.040<br>(0.043)  | -0.066<br>(0.388) | 0.003<br>(0.030)   | 0.084<br>(0.320)    | -0.039<br>(0.270) | -0.053<br>(0.250)    | -0.054<br>(0.176)  | -0.043<br>(0.083) | -0.008<br>(0.035)  | -0.030<br>(0.074)    | 0.125<br>(0.213)   |
| ManagerTenure                  | -0.214<br>(0.244) | -0.011<br>(0.019) | 0.018<br>(0.083)  | -0.002<br>(0.006)  | -0.115**<br>(0.055) | -0.054<br>(0.049) | 0.040<br>(0.052)     | -0.004<br>(0.037)  | -0.015<br>(0.014) | 0.003<br>(0.007)   | -0.017<br>(0.014)    | -0.035<br>(0.043)  |
| PastYears                      | -0.459<br>(0.459) | 0.038<br>(0.055)  | -0.034<br>(0.116) | 0.011<br>(0.009)   | 0.0009<br>(0.111)   | -0.100<br>(0.094) | -0.227***<br>(0.069) | 0.024<br>(0.053)   | -0.004<br>(0.027) | -0.020*<br>(0.011) | -0.072***<br>(0.027) | -0.076<br>(0.081)  |
| PastContracts                  | 0.504<br>(0.571)  | -0.014<br>(0.034) | 0.132<br>(0.231)  | -0.022*<br>(0.013) | 0.147<br>(0.141)    | 0.222*<br>(0.128) | 0.424***<br>(0.097)  | -0.151*<br>(0.085) | -0.031<br>(0.034) | 0.021<br>(0.014)   | 0.035<br>(0.031)     | 0.086<br>(0.090)   |
| <i>Fixed-effects</i>           |                   |                   |                   |                    |                     |                   |                      |                    |                   |                    |                      |                    |
| HalfDecade-ContractType        | Yes               | Yes               | Yes               | Yes                | Yes                 | Yes               | Yes                  | Yes                | Yes               | Yes                | Yes                  | Yes                |
| <i>Fit statistics</i>          |                   |                   |                   |                    |                     |                   |                      |                    |                   |                    |                      |                    |
| Observations                   | 398               | 398               | 398               | 398                | 398                 | 398               | 398                  | 398                | 398               | 398                | 398                  | 398                |
| R <sup>2</sup>                 | 0.381             | 0.087             | 0.265             | 0.420              | 0.177               | 0.392             | 0.429                | 0.474              | 0.319             | 0.251              | 0.371                | 0.188              |
| Within R <sup>2</sup>          | 0.108             | 0.036             | 0.097             | 0.112              | 0.084               | 0.077             | 0.125                | 0.146              | 0.061             | 0.092              | 0.129                | 0.092              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "ManagerTenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

### 4.3 Interacting manager changes with contract type

Hypothesis 2 posits that the effect from Hypothesis 1 is driven by DSP (or concession) contracts, which provide a large amount of discretion to the buyer, who is thus able to credibly commit to repeated interactions. Although there are many confounding factors that could explain why DSP contracts are more affected by manager changes than MP (standard procurement) contracts other than high discretion and relational contracts, it is worth checking whether this prediction is verified empirically. In the main specification, I interact the "Manager" variable with a "type of contract" dummy variable. Results (table 4) indicate that the non interacted "Unknown manager" coefficient (i.e. the one corresponding with DSP contracts) is positively and significantly associated with "state of infrastructure" and "monitoring" categories of rigidity, confirming the general effect of manager changes on rigidity. On the other hand, manager changes appear to affect MP contracts through an increase in adaptation clauses, designed to plan out future renegotiations (although this effect is only significant at the 10 % level). This effect is surprising, given that renegotiation clauses tend to be more frequent in DSP contracts overall.

Overall, these results support the intuition that the general effect of manager changes is driven by DSP contracts rather than by MP contracts. To confirm this intuition, I run the basic set of regressions for hypothesis 1 on the subsample of DSP contracts. Results are stable and show significant evidence that manager changes affect the "state" and "monitoring" rigidity categories for the subset of DSP contracts (table 10). When adding city fixed effects to this specification (table 11), the coefficient for "monitoring" remains significant at the 10% level, potentially indicating that the inclusion of MP contracts generated some noise in the initial sample.

**Table 4:** Manager changes and rigidity according to contract type

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4)  | Fault<br>(5)       | Disputes<br>(6)   | Penalties<br>(7)     | Permits<br>(8)      | Quality<br>(9)    | Delays<br>(10)     | State<br>(11)        | Monitoring<br>(12) |
|--------------------------------|-------------------|-------------------|-------------------|---------------------|--------------------|-------------------|----------------------|---------------------|-------------------|--------------------|----------------------|--------------------|
| <i>Variables</i>               |                   |                   |                   |                     |                    |                   |                      |                     |                   |                    |                      |                    |
| Manager_Unknown                | 1.16<br>(1.07)    | -0.106<br>(0.098) | 0.436<br>(0.309)  | -0.016<br>(0.019)   | -0.043<br>(0.211)  | -0.008<br>(0.220) | 0.307<br>(0.205)     | 0.034<br>(0.124)    | 0.020<br>(0.056)  | 0.035<br>(0.027)   | 0.155**<br>(0.065)   | 0.382**<br>(0.152) |
| Manager_FirstContract          | 0.965<br>(1.41)   | -0.010<br>(0.059) | 0.124<br>(0.429)  | 0.036<br>(0.032)    | 0.322<br>(0.339)   | 0.163<br>(0.318)  | -0.092<br>(0.298)    | 0.143<br>(0.188)    | -0.012<br>(0.089) | 0.015<br>(0.036)   | -0.014<br>(0.084)    | 0.280<br>(0.214)   |
| Manager_Tenure                 | -0.158<br>(0.255) | -0.016<br>(0.019) | 0.033<br>(0.086)  | -0.0002<br>(0.006)  | -0.102*<br>(0.057) | -0.043<br>(0.051) | 0.039<br>(0.053)     | 0.007<br>(0.037)    | -0.013<br>(0.015) | 0.003<br>(0.007)   | -0.017<br>(0.014)    | -0.025<br>(0.044)  |
| Past_Years                     | -0.495<br>(0.466) | 0.042<br>(0.055)  | -0.046<br>(0.115) | 0.010<br>(0.009)    | -0.008<br>(0.110)  | -0.108<br>(0.097) | -0.226***<br>(0.069) | 0.017<br>(0.054)    | -0.006<br>(0.027) | -0.020*<br>(0.011) | -0.073***<br>(0.027) | -0.084<br>(0.081)  |
| Past_Contracts                 | 0.612<br>(0.582)  | -0.022<br>(0.035) | 0.156<br>(0.231)  | -0.019<br>(0.013)   | 0.172<br>(0.141)   | 0.244*<br>(0.135) | 0.420***<br>(0.098)  | -0.132<br>(0.084)   | -0.028<br>(0.035) | 0.023<br>(0.014)   | 0.036<br>(0.032)     | 0.103<br>(0.090)   |
| Manager_Unknown × TypeMP       | -0.557<br>(1.80)  | 0.221*<br>(0.131) | -0.573<br>(0.471) | -0.008<br>(0.035)   | -0.196<br>(0.415)  | -0.184<br>(0.312) | -0.0006<br>(0.264)   | -0.110<br>(0.192)   | -0.066<br>(0.112) | 0.015<br>(0.044)   | 0.0003<br>(0.104)    | -0.215<br>(0.274)  |
| Manager_FirstContract × TypeMP | -2.55<br>(1.99)   | 0.106<br>(0.085)  | -0.419<br>(0.466) | -0.078**<br>(0.038) | -0.557<br>(0.472)  | -0.474<br>(0.409) | 0.093<br>(0.305)     | -0.466**<br>(0.217) | -0.071<br>(0.119) | -0.057<br>(0.050)  | -0.037<br>(0.096)    | -0.356<br>(0.288)  |
| <i>Fixed-effects</i>           |                   |                   |                   |                     |                    |                   |                      |                     |                   |                    |                      |                    |
| HalfDecade-ContractType        | Yes               | Yes               | Yes               | Yes                 | Yes                | Yes               | Yes                  | Yes                 | Yes               | Yes                | Yes                  | Yes                |
| <i>Fit statistics</i>          |                   |                   |                   |                     |                    |                   |                      |                     |                   |                    |                      |                    |
| Observations                   | 398               | 398               | 398               | 398                 | 398                | 398               | 398                  | 398                 | 398               | 398                | 398                  | 398                |
| R <sup>2</sup>                 | 0.385             | 0.096             | 0.268             | 0.430               | 0.182              | 0.396             | 0.430                | 0.481               | 0.320             | 0.258              | 0.371                | 0.192              |
| Within R <sup>2</sup>          | 0.115             | 0.045             | 0.101             | 0.127               | 0.089              | 0.082             | 0.125                | 0.158               | 0.063             | 0.100              | 0.130                | 0.096              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. It is interacted with a "Type" dummy variable: if "Type\_MP" is equal to one, this indicates a standard procurement contract. The non interacted coefficient for "Manager\_Unknown" thus reflects the effect for units which are not MP contracts, i.e. DSP contracts. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "Manager\_Tenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "Past\_Years" and "Past\_Contracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city × time level. Signif. Codes: \*\*\*, 0.01, \*\*, 0.05, \*, 0.1

## 4.4 Investigating the mediating role of public scrutiny

This subsection discusses the results for the tests on the mediating effect of public scrutiny. While the main effect of public scrutiny variables (NEP and closeness to elections) on rigidity is expected to be positive, the interaction with *Manager\_Unknown* is expected to have a negative coefficient, as public scrutiny should reduce the relevance of manager identity in determining rigidity. Table 6 presents the results for the regressions using the number of effective parties (NEP) as a proxy for political contestability. I split the NEP at the integer above the median, i.e. 3, and interact this dummy variable with the "Manager" treatment. Results do not confirm our theoretical predictions, as we observe positive and significant coefficients of  $Manager\_Unknown \times (NEP > 3)$  for two rigidity variables, and no negative and significant effect. Next, I use the *PreElection* dummy variable to proxy public scrutiny (table 7). In this case, evidence is mixed. We observe the expected effects for the "Delays" rigidity category, but the opposite effect for the "Quality" category. Again, these results do not allow us to confirm Hypothesis 3. Overall, results from the interaction of manager changes with public scrutiny do not support the idea that public scrutiny plays a mediating role in the relationship between manager identity and contract rigidity.

## 5 Discussion

### 5.1 Alternative channels

This section discusses the interpretation of results presented above. Overall, results indicate that contracts signed by municipalities with unknown managers are more likely to contain clauses introducing penalties and monitor the state of the operated infrastructure, potentially signaling increased distrust. The theoretical channel proposed in this article is relational contracting, and the fact that newly appointed managers may induce local governments to reinforce contractual guarantees against potential misconduct. Alternative channels may however be put forward to explain this result.

**Project heterogeneity.** Despite regressions controlling for observable confounders, and despite the parking lot industry being a highly standardized one, some unobserved heterogeneity may still drive results. Projects involving newly appointed managers could for example be associated with more sophisticated larger-scale constructions, which require high-detail contracts. However, I believe that such dynamic has no particular theoretical grounding. On the contrary, theory tends to predict that long-standing relationships lead to increased stakes [Watson, 1999; Halac, 2013], meaning that recent contractual relationships (in our case, assuming a relationship is "reset" when a new manager is appointed) should lead to less

**Table 5:** Municipality-company relationship and size of contract

| Relationship status | Number of slots in parking lot |
|---------------------|--------------------------------|
| First Contract      | 908                            |
| Unknown Manager     | 1073                           |
| Known Manager(s)    | 1108                           |

*Note:* This table presents the average number of slots in a parking lot contract according to the type of relationship between the municipality and the company. "First Contract" indicates the first ever contract in the history of the relationship. "Unknown Manager" indicates a contract in a pre-existing relationship, but with a new manager of the private company. "Known Manager(s)" indicates that the municipality has signed contracts with the company under current management.

ambitious designs. I confirm this prediction by showing in table 5 that on average, contracts signed with unknown managers are smaller in number of slots (and even smaller in the first ever contract between parties), supporting the prediction that parties are willing to increase stakes as the relationship progresses.

**The complementarity of written provisions and relational contracting.** An alternative view of the results presented above stems from the theoretical framework developed in Iossa and Spagnolo [2011]. In this model, formal clauses are used as reinforcers of relational contracts. Specifically, the model considers written clauses on a set of verifiable tasks, which bring little utility to the principal (i.e. *overcontracting*), but which may be used as punishment in case of deviation from the unwritten part of the contract. On the cooperative equilibrium path, these clauses are not enforced.

The main result in the present study is that penalty clauses and requirements on the state of the infrastructure are more likely to be present in contracts signed with unknown managers. An interpretation of this result through the lens of Iossa and Spagnolo [2011] could be the following: regardless of whether the manager is known or not, the local government wishes to enforce some unverifiable aspect of performance through relational contracting. However, because of distrust in unknown managers, the relational contract must be supported by additional penalty clauses which are used only in case of deviation from the relational contract. The essential factor to decide between the main interpretation of results (relational contracts are less likely with unknown managers), and this interpretation is whether additional penalties and monitoring clauses are actually enforced. For the moment, data on the matter is not available, but this discussion opens a promising avenue for future research. Importantly, in terms of transaction costs, the welfare implications of my main result are equivalent whatever the underlying theoretical framework: municipalities prefer avoiding the inclusion of penalties and monitoring clauses when dealing with known managers (indicating that they are to some extent costly), while they are compelled to include them when dealing with unknown

managers (be it because relational contracting is impossible, or because overcontracting is necessary to enforce the relational contract.)

## 5.2 Welfare and policy implications

**Rules versus discretion.** The results presented in this study point in the direction that relational contracting does exist in public-private contracts, or at the very least that the relationship between parties plays a role in shaping contractual arrangements. If knowledge of the manager is required to rely on flexible contracts with a relational contract, then, *a fortiori*, knowledge of the firm in general also is. Such an intuition is confirmed by the fact that the main result is driven by DSP contracts, which are awarded with high discretion. This points in the direction that the ability to repeatedly award contracts to the same firm presents some economic utility, supporting the use of high discretion awarding procedures in cases where relational contracting is more efficient than competition.

**Transaction costs.** The main result in this study shows that dealing with known managers allows to rely on more flexible, less formalized contractual arrangements. It suggests that relational contracting, or more generally trust in the private partner, may reduce transaction costs. An important question regarding the extent of this effect is whether the additional clauses observed in contracts signed with new managers are actually enforced. As discussed previously, this question remains to be settled. Pure "ink" costs associated with adding new penalties or monitoring clauses may appear quite negligible, especially if these clauses are standardized. The gist of transaction costs associated with including new clauses is likely related to monitoring and renegotiating such clauses, as well as court procedures to enforce them. Concerning one of those points, there is evidence that increased rigidity is associated with increased renegotiation [Beuve et al., 2021]. Interacting with known manager may hence help reduce costs associated with renegotiation. Concerning monitoring and court procedures, additional evidence should be gathered in order to fully estimate the costs of additional rigidity clauses.

**Does additional rigidity harm the relationship?** This study has so far been concerned with the effects of firm-municipality relationship on rigidity. However, a potential welfare-relevant consequence of increased rigidity concerns its effects on future business prospects. If highly rigid contracts are more costly (both to monitor on the buyer side and to perform on the firm side), they may deter parties from engaging in further contractual relationships. Existing evidence, however, points in the opposite direction: [Moszoro et al., 2024] find that rigidity actually tends to improve renewal prospects on average. Thus, it can be concluded that the increase in rigidity due to dealing with unknown managers is not harmful for the preservation of the contractual relationship, and may actually be useful to its continuation.

**Are relational contracts really necessary in the parking lot industry?** A final important question which remains to be answered is whether contract incompleteness truly makes relational contracts necessary in the parking lot industry. Indeed, when supplying a homogeneous, standardized service, the need for informal provisions is not obvious. However, it is a well known phenomenon in the case of infrastructure-based industries that the requirement of leaving the infrastructure in good state upon contract termination is often hard to verify in court. Clauses related to quality of the infrastructure are typically those which appear more frequent in the aftermath of manager changes, potentially indicating that opportunistic behavior may be an issue in this field. Additionally, in concession contracts, there is also space for opportunistic behavior in the financial management of the parking lot: because the concessionnaire generally sets consumer prices, it may have incentives to simply rely on increased prices rather than cost reduction to ensure profitability. Relational contracts may act as a disciplining tool in this domain where, due to insufficient competency, the public buyer may be unable to assess in real time whether price increased are truly justified or simply due to firm opportunism. These considerations lead me to believe that relational contracting may have a role to play in the industry of parking lots, despite them being a rather standardized good.

## 6 Conclusion

This paper examines whether relational contracts play a role in shaping public-private agreements. Using a negative proxy for relational contracting, i.e. the fact the municipality is dealing with managers that it has not previously contracted with. I find some evidence that public contracts are more rigidly written when the municipality has not previously interacted with the current set of managers. Specifically, clauses concerning penalties and monitoring of the contractor, which one can relate to distrust, are significantly affected by manager changes. Evidence is stronger when focusing on DSP (concession-like) contracts, which given their long duration and high discretion awarding procedures appear more prone to the development of relational contracts, and flexible agreements. When turning to the role of third party opportunism, I do not find evidence that public scrutiny plays a significant mediating role on the relationship between manager identity and relational contracting.

This work remains subjected to several critiques. The diversity in nature of managers is not taken into account in the current state of our data. Indeed, manager changes encompass changes at the global head of the company, but also changes in the identity of regional branch managers. Moreover, it is likely that the managers considered in this study do not directly negotiate contracts: while my preferred explanatory channel is that manager changes generate distrust on the municipality side, and that the additional rigidity is demanded by

the municipality, information on the precise mechanics of contract negotiation would shed light on the drivers of our results. In addition, the endogeneity of manager changes is not fully taken into account. Although I do not find that the effect is driven by larger cities, which may have sufficient bargaining power to lead to manager changes, fully accounting for endogeneity by instrumenting manager changes could provide robustness to the results. Finally, due to the small size of the sample, two-way fixed effects often fails to yield significant coefficients, and the specifications without city fixed effects may fail to entirely account for unobserved heterogeneity. Rather than being understood as true causal effects, these results should thus be more cautiously regarded as robust correlations, potentially indicative of a relational contracting model being at play.

Potential follow-ups to this study include the use of data on judicial procedures to obtain additional information on the relational quality of the contract: one may expect that judicial disputes represent a failure of the relational contract, as parties must revert to relying on written clauses. Future works relating changes in management with judicial procedures would shed additional light on the relational dimension of those manager changes. Additionally, this study focuses on changes in management on the company side. I do not examine whether bureaucratic or political turnovers within municipalities have an effect on contract rigidity. The study of public official identity, coupled with the literature on public scrutiny, may provide an interesting research avenue for the political economy of how public contracts are written. An additional avenue for research concerns reputational spillovers of company behavior: in this study, I consider bilateral relationships between several municipalities and a single company to be independent from one another, and distrust to stem only from the municipality not having interacted with current manager(s) previously. One could assume that opportunistic behavior on the company side may harm its reputation towards other cities, potentially affecting the way other cities write contracts, and whether other cities award contracts to this firm.

**Table 6:** Effect of manager changes according to political competition

| Dependent Variables:<br>Model:    | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)      | Disputes<br>(6)   | Penalties<br>(7)  | Permits<br>(8)    | Quality<br>(9)    | Delays<br>(10)    | State<br>(11)       | Monitoring<br>(12) |
|-----------------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------|--------------------|
| <i>Variables</i>                  |                   |                   |                   |                    |                   |                   |                   |                   |                   |                   |                     |                    |
| Manager_Unknown                   | -0.230<br>(1.27)  | 0.031<br>(0.159)  | -0.060<br>(0.308) | -0.041*<br>(0.024) | -0.220<br>(0.271) | -0.171<br>(0.233) | 0.070<br>(0.187)  | -0.051<br>(0.144) | -0.084<br>(0.077) | -0.004<br>(0.030) | 0.100<br>(0.072)    | 0.239<br>(0.195)   |
| Manager_FirstContract             | -0.259<br>(1.93)  | 0.115<br>(0.084)  | 0.043<br>(0.445)  | 0.009<br>(0.037)   | -0.020<br>(0.464) | 0.032<br>(0.315)  | -0.379<br>(0.274) | 0.026<br>(0.230)  | 0.016<br>(0.116)  | -0.020<br>(0.047) | -0.107<br>(0.101)   | 0.013<br>(0.315)   |
| (NEP > 3)                         | -2.16<br>(2.35)   | -0.004<br>(0.190) | -0.430<br>(0.529) | -0.050<br>(0.037)  | 0.141<br>(0.559)  | -0.364<br>(0.449) | -0.182<br>(0.257) | -0.256<br>(0.206) | -0.187<br>(0.135) | -0.064<br>(0.052) | -0.211**<br>(0.106) | 0.360<br>(0.315)   |
| ManagerTenure                     | 0.116<br>(0.336)  | -0.011<br>(0.025) | 0.068<br>(0.081)  | 0.002<br>(0.008)   | -0.050<br>(0.078) | 0.008<br>(0.067)  | 0.066<br>(0.061)  | 0.023<br>(0.050)  | -0.008<br>(0.018) | 0.012<br>(0.009)  | 0.001<br>(0.016)    | -0.004<br>(0.057)  |
| PastYears                         | -0.109<br>(0.506) | 0.032<br>(0.056)  | 0.001<br>(0.117)  | 0.012<br>(0.010)   | 0.089<br>(0.128)  | -0.084<br>(0.097) | -0.099<br>(0.069) | 0.031<br>(0.063)  | 0.002<br>(0.029)  | -0.015<br>(0.012) | -0.044<br>(0.029)   | -0.014<br>(0.091)  |
| PastContracts                     | 0.295<br>(1.12)   | 0.011<br>(0.047)  | 0.252<br>(0.306)  | -0.013<br>(0.022)  | -0.020<br>(0.298) | 0.403*<br>(0.220) | 0.039<br>(0.134)  | -0.056<br>(0.118) | 0.029<br>(0.068)  | 0.020<br>(0.025)  | -0.054<br>(0.062)   | -0.059<br>(0.184)  |
| Manager_Unknown × (NEP > 3)       | 1.70<br>(2.53)    | -0.093<br>(0.175) | 0.623<br>(0.655)  | 0.043<br>(0.047)   | -0.243<br>(0.628) | 0.044<br>(0.452)  | 0.269<br>(0.305)  | -0.093<br>(0.270) | 0.292*<br>(0.159) | 0.093*<br>(0.056) | 0.138<br>(0.134)    | -0.338<br>(0.365)  |
| Manager_FirstContract × (NEP > 3) | 2.61<br>(2.66)    | -0.132<br>(0.189) | 0.645<br>(0.598)  | 0.030<br>(0.048)   | 0.047<br>(0.626)  | 0.604<br>(0.526)  | 0.426<br>(0.339)  | 0.163<br>(0.271)  | 0.228<br>(0.158)  | 0.097<br>(0.062)  | 0.155<br>(0.117)    | -0.121<br>(0.377)  |
| <i>Fixed-effects</i>              |                   |                   |                   |                    |                   |                   |                   |                   |                   |                   |                     |                    |
| HalfDecade-ContractType           | Yes               | Yes               | Yes               | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes                 | Yes                |
| <i>Fit statistics</i>             |                   |                   |                   |                    |                   |                   |                   |                   |                   |                   |                     |                    |
| Observations                      | 291               | 291               | 291               | 291                | 291               | 291               | 291               | 291               | 291               | 291               | 291                 | 291                |
| R <sup>2</sup>                    | 0.400             | 0.105             | 0.350             | 0.319              | 0.176             | 0.372             | 0.416             | 0.495             | 0.304             | 0.285             | 0.383               | 0.170              |
| Within R <sup>2</sup>             | 0.140             | 0.044             | 0.148             | 0.153              | 0.102             | 0.086             | 0.148             | 0.187             | 0.095             | 0.136             | 0.179               | 0.125              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. It is interacted with "NEP > 3", a dummy variable whether or not the number of effective parties (see Section 3.4.) in the most recent municipal election was greater than 3. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "ManagerTenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city × time level. Signif. Codes: \*\*\*, 0.01, \*\*, 0.05, \*, 0.1

**Table 7:** Effect of manager changes on contract rigidity in pre-election periods

| Dependent Variables:<br>Model:         | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)       | Disputes<br>(6)   | Penalties<br>(7)     | Permits<br>(8)      | Quality<br>(9)    | Delays<br>(10)     | State<br>(11)       | Monitoring<br>(12) |
|----------------------------------------|-------------------|-------------------|-------------------|--------------------|--------------------|-------------------|----------------------|---------------------|-------------------|--------------------|---------------------|--------------------|
| <i>Variables</i>                       |                   |                   |                   |                    |                    |                   |                      |                     |                   |                    |                     |                    |
| Manager_Unknown                        | 0.630<br>(0.975)  | -0.017<br>(0.074) | 0.246<br>(0.292)  | -0.022<br>(0.017)  | -0.201<br>(0.221)  | -0.047<br>(0.156) | 0.234<br>(0.176)     | 0.075<br>(0.093)    | -0.019<br>(0.061) | 0.018<br>(0.024)   | 0.140**<br>(0.061)  | 0.182<br>(0.149)   |
| Manager_FirstContract                  | -0.384<br>(1.44)  | 0.080<br>(0.061)  | -0.117<br>(0.383) | 0.001<br>(0.031)   | -0.032<br>(0.339)  | 0.032<br>(0.279)  | -0.156<br>(0.257)    | -0.056<br>(0.177)   | -0.069<br>(0.086) | -0.032<br>(0.037)  | -0.017<br>(0.077)   | 0.069<br>(0.207)   |
| PreElec                                | 0.350<br>(1.42)   | 0.097<br>(0.095)  | 0.179<br>(0.375)  | 0.003<br>(0.024)   | -0.160<br>(0.296)  | 0.346<br>(0.386)  | -0.214<br>(0.204)    | 0.058<br>(0.125)    | -0.022<br>(0.085) | -0.040<br>(0.032)  | 0.094<br>(0.070)    | 0.026<br>(0.195)   |
| ManagerTenure                          | -0.183<br>(0.247) | -0.013<br>(0.019) | 0.033<br>(0.083)  | -0.001<br>(0.006)  | -0.110*<br>(0.057) | -0.048<br>(0.049) | 0.041<br>(0.053)     | 0.006<br>(0.036)    | -0.014<br>(0.014) | 0.003<br>(0.007)   | -0.017<br>(0.014)   | -0.034<br>(0.043)  |
| PastYears                              | -0.389<br>(0.476) | 0.045<br>(0.055)  | -0.022<br>(0.121) | 0.011<br>(0.009)   | -0.001<br>(0.115)  | -0.079<br>(0.093) | -0.231***<br>(0.070) | 0.015<br>(0.052)    | -0.003<br>(0.028) | -0.020*<br>(0.011) | -0.062**<br>(0.028) | -0.058<br>(0.079)  |
| PastContracts                          | 0.469<br>(0.595)  | -0.018<br>(0.033) | 0.129<br>(0.237)  | -0.022*<br>(0.013) | 0.147<br>(0.145)   | 0.215<br>(0.132)  | 0.424***<br>(0.098)  | -0.144*<br>(0.084)  | -0.032<br>(0.035) | 0.020<br>(0.014)   | 0.030<br>(0.033)    | 0.075<br>(0.091)   |
| Manager_Unknown $\times$ PreElec       | 0.569<br>(1.66)   | -0.015<br>(0.155) | -0.236<br>(0.479) | -0.002<br>(0.038)  | 0.228<br>(0.369)   | -0.277<br>(0.403) | 0.319<br>(0.276)     | -0.394**<br>(0.186) | 0.040<br>(0.112)  | 0.082**<br>(0.040) | 0.025<br>(0.099)    | 0.349<br>(0.297)   |
| Manager_FirstContract $\times$ PreElec | 2.82<br>(2.11)    | -0.170<br>(0.121) | 0.748<br>(0.507)  | 0.019<br>(0.045)   | 0.682<br>(0.504)   | 0.010<br>(0.584)  | 0.480<br>(0.355)     | 0.135<br>(0.206)    | 0.173<br>(0.111)  | 0.121**<br>(0.050) | 0.052<br>(0.109)    | 0.495<br>(0.380)   |
| <i>Fixed-effects</i>                   |                   |                   |                   |                    |                    |                   |                      |                     |                   |                    |                     |                    |
| HalfDecade-ContractType                | Yes               | Yes               | Yes               | Yes                | Yes                | Yes               | Yes                  | Yes                 | Yes               | Yes                | Yes                 | Yes                |
| <i>Fit statistics</i>                  |                   |                   |                   |                    |                    |                   |                      |                     |                   |                    |                     |                    |
| Observations                           | 398               | 398               | 398               | 398                | 398                | 398               | 398                  | 398                 | 398               | 398                | 398                 | 398                |
| R <sup>2</sup>                         | 0.388             | 0.092             | 0.274             | 0.421              | 0.182              | 0.397             | 0.432                | 0.481               | 0.324             | 0.266              | 0.384               | 0.203              |
| Within R <sup>2</sup>                  | 0.119             | 0.042             | 0.108             | 0.113              | 0.089              | 0.085             | 0.129                | 0.157               | 0.068             | 0.110              | 0.147               | 0.108              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. It is interacted with a PreElection variable indicating whether the contract was signed within 12 months preceding a municipal election. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "ManagerTenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*, 0.01, \*\*, 0.05, \*, 0.1

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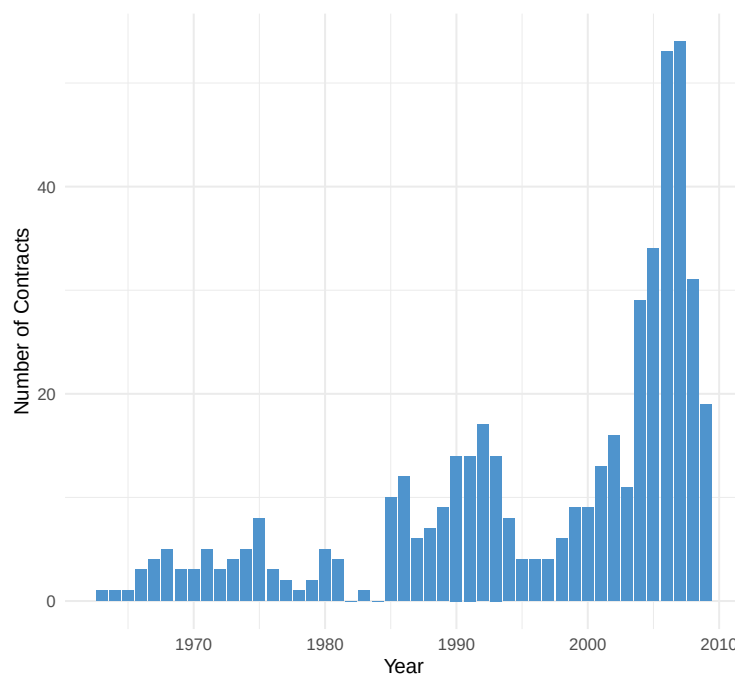
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# Appendix

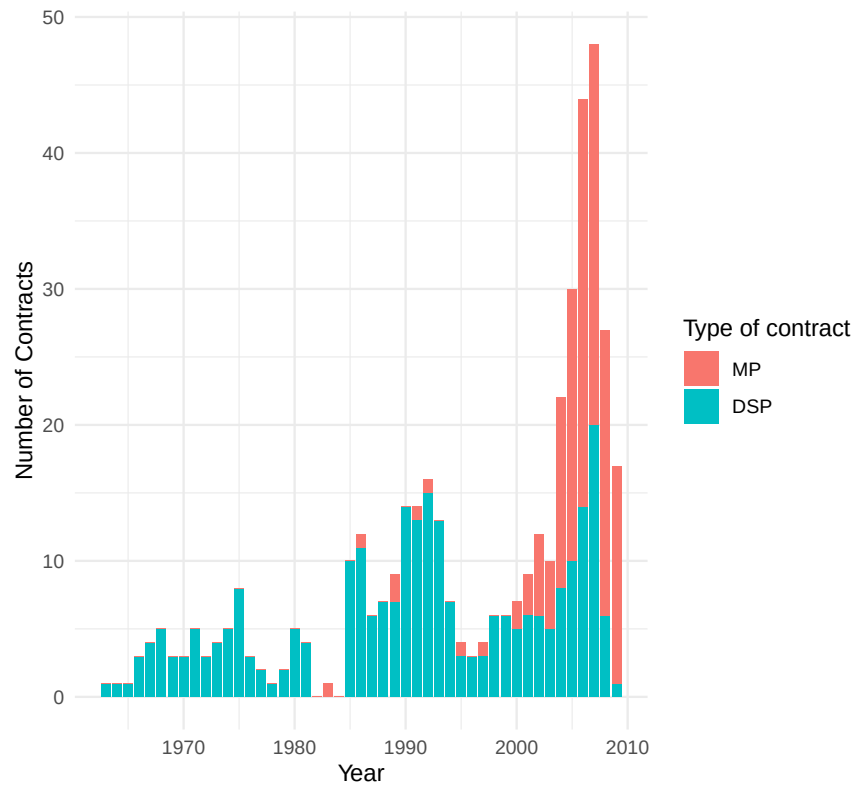
## A1: Additional descriptive statistics

**Figure 3:** Number of contracts signed per year



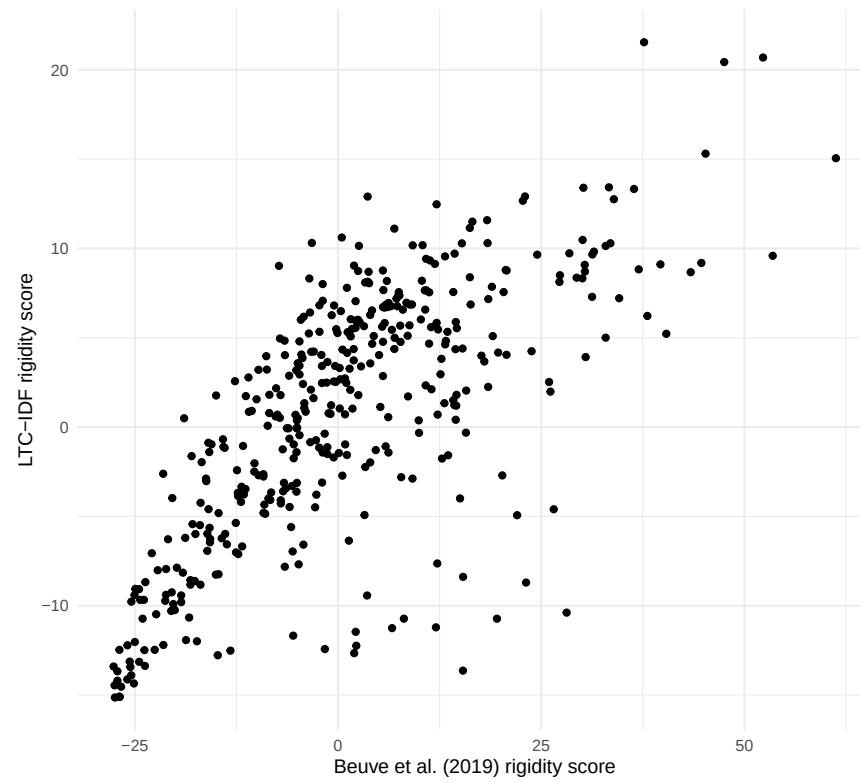
*Note: This figure plots the number of contracts signed each year in our data. Source: Author.*

**Figure 4:** Number of contracts signed per year (according to contract type)



*Note: This figure plots the number of contracts signed each year in our data, separating between main contract types. MP indicates standard procurement contracts, while DSP refers to concession contracts. Source: Author.*

**Figure 5:** Comparison of LTC-IDF rigidity score with the [Beuve et al. \[2019\]](#) score



*This figure plots the LTC-IDF rigidity score, constructed in this study, against the rigidity score developed by [Beuve et al. \[2019\]](#). Source: Author.*

## A2: Robustness checks

**Table 8:** Test for hypothesis 1, Paris excluded from the sample

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Adaptation<br>(2)  | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)      | Disputes<br>(6)    | Penalties<br>(7)    | Permits<br>(8)    | Quality<br>(9)    | Delays<br>(10)    | State<br>(11)      | Monitoring<br>(12) |
|--------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|---------------------|-------------------|-------------------|-------------------|--------------------|--------------------|
| <i>Variables</i>               |                   |                    |                   |                    |                   |                    |                     |                   |                   |                   |                    |                    |
| Manager_Unknown                | 0.353<br>(1.05)   | -0.0001<br>(0.100) | 0.138<br>(0.278)  | -0.025<br>(0.020)  | -0.260<br>(0.224) | -0.124<br>(0.186)  | 0.227<br>(0.181)    | -0.034<br>(0.107) | -0.011<br>(0.068) | 0.021<br>(0.026)  | 0.144**<br>(0.062) | 0.096<br>(0.159)   |
| Manager_FirstContract          | 0.068<br>(1.64)   | 0.063<br>(0.063)   | 0.057<br>(0.398)  | 0.016<br>(0.033)   | 0.055<br>(0.416)  | 0.266<br>(0.279)   | -0.277<br>(0.281)   | -0.013<br>(0.201) | 0.018<br>(0.103)  | -0.012<br>(0.042) | -0.056<br>(0.089)  | -0.038<br>(0.273)  |
| ManagerTenure                  | -0.165<br>(0.299) | -0.010<br>(0.020)  | -0.031<br>(0.074) | 0.0008<br>(0.007)  | -0.102<br>(0.069) | -0.050<br>(0.059)  | 0.032<br>(0.062)    | 0.016<br>(0.044)  | -0.011<br>(0.016) | 0.007<br>(0.008)  | -0.025<br>(0.015)  | -0.018<br>(0.050)  |
| PastYears                      | -0.319<br>(0.489) | 0.037<br>(0.055)   | -0.043<br>(0.118) | 0.008<br>(0.010)   | 0.050<br>(0.115)  | -0.117<br>(0.104)  | -0.152**<br>(0.073) | 0.001<br>(0.060)  | -0.007<br>(0.027) | -0.018<br>(0.011) | -0.053*<br>(0.029) | -0.009<br>(0.084)  |
| PastContracts                  | 0.567<br>(1.00)   | -0.0002<br>(0.040) | 0.243<br>(0.275)  | -0.002<br>(0.020)  | 0.087<br>(0.276)  | 0.482**<br>(0.226) | 0.144<br>(0.144)    | -0.064<br>(0.106) | 0.018<br>(0.058)  | 0.021<br>(0.024)  | -0.020<br>(0.059)  | -0.091<br>(0.163)  |
| <i>Fixed-effects</i>           |                   |                    |                   |                    |                   |                    |                     |                   |                   |                   |                    |                    |
| HalfDecade-ContractType        | Yes               | Yes                | Yes               | Yes                | Yes               | Yes                | Yes                 | Yes               | Yes               | Yes               | Yes                | Yes                |
| <i>Fit statistics</i>          |                   |                    |                   |                    |                   |                    |                     |                   |                   |                   |                    |                    |
| Observations                   | 339               | 339                | 339               | 339                | 339               | 339                | 339                 | 339               | 339               | 339               | 339                | 339                |
| R <sup>2</sup>                 | 0.404             | 0.098              | 0.338             | 0.399              | 0.177             | 0.388              | 0.366               | 0.507             | 0.347             | 0.250             | 0.406              | 0.228              |
| Within R <sup>2</sup>          | 0.120             | 0.035              | 0.123             | 0.143              | 0.088             | 0.069              | 0.094               | 0.175             | 0.072             | 0.095             | 0.139              | 0.110              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Contracts signed in Paris are excluded from the sample. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "ManagerTenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

**Table 9:** Results for hypothesis 1, including city fixed effects

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)      | Disputes<br>(6)   | Penalties<br>(7)  | Permits<br>(8)    | Quality<br>(9)    | Delays<br>(10)    | State<br>(11)     | Monitoring<br>(12) |
|--------------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--------------------|
| <i>Variables</i>               |                   |                   |                   |                    |                   |                   |                   |                   |                   |                   |                   |                    |
| Manager_Unknown                | 0.157<br>(1.11)   | -0.033<br>(0.062) | 0.004<br>(0.370)  | -0.019<br>(0.022)  | -0.190<br>(0.271) | -0.201<br>(0.179) | 0.214<br>(0.218)  | 0.026<br>(0.142)  | -0.046<br>(0.066) | 0.016<br>(0.026)  | 0.092<br>(0.071)  | 0.225<br>(0.163)   |
| Manager_FirstContract          | -0.237<br>(2.13)  | -0.094<br>(0.080) | 0.200<br>(0.616)  | 0.009<br>(0.041)   | -0.203<br>(0.480) | 0.002<br>(0.353)  | 0.019<br>(0.397)  | 0.002<br>(0.301)  | -0.007<br>(0.141) | -0.016<br>(0.048) | 0.021<br>(0.125)  | -0.054<br>(0.327)  |
| Manager_Tenure                 | 0.106<br>(0.348)  | -0.033<br>(0.024) | 0.001<br>(0.153)  | 0.005<br>(0.007)   | -0.062<br>(0.083) | -0.015<br>(0.076) | 0.141*<br>(0.076) | 0.030<br>(0.056)  | 0.005<br>(0.027)  | 0.007<br>(0.009)  | 0.0001<br>(0.023) | 0.012<br>(0.061)   |
| Past_Years                     | -0.575<br>(0.906) | -0.036<br>(0.045) | 0.348<br>(0.292)  | -0.021<br>(0.018)  | -0.106<br>(0.201) | -0.068<br>(0.185) | -0.117<br>(0.165) | -0.159<br>(0.124) | 0.014<br>(0.058)  | -0.023<br>(0.022) | -0.019<br>(0.053) | -0.052<br>(0.121)  |
| Past_Contracts                 | 1.05<br>(1.29)    | 0.008<br>(0.056)  | 0.224<br>(0.403)  | 0.029<br>(0.027)   | 0.080<br>(0.274)  | 0.132<br>(0.294)  | 0.381<br>(0.234)  | 0.021<br>(0.175)  | 0.015<br>(0.084)  | 0.026<br>(0.035)  | 0.064<br>(0.079)  | -0.057<br>(0.216)  |
| <i>Fixed-effects</i>           |                   |                   |                   |                    |                   |                   |                   |                   |                   |                   |                   |                    |
| HalfDecade-ContractType        | Yes               | Yes               | Yes               | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes                |
| city                           | Yes               | Yes               | Yes               | Yes                | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes               | Yes                |
| <i>Fit statistics</i>          |                   |                   |                   |                    |                   |                   |                   |                   |                   |                   |                   |                    |
| Observations                   | 398               | 398               | 398               | 398                | 398               | 398               | 398               | 398               | 398               | 398               | 398               | 398                |
| R <sup>2</sup>                 | 0.648             | 0.683             | 0.495             | 0.754              | 0.571             | 0.714             | 0.649             | 0.725             | 0.596             | 0.620             | 0.649             | 0.586              |
| Within R <sup>2</sup>          | 0.045             | 0.053             | 0.099             | 0.070              | 0.056             | 0.065             | 0.094             | 0.210             | 0.051             | 0.045             | 0.047             | 0.057              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "Manager\_Tenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "Past\_Years" and "Past\_Contracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects and city fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*, 0.01, \*\*, 0.05, \*, 0.1

**Table 10:** Results for Hypothesis 1, focusing only on DSP contracts (no city fixed effects)

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)      | Disputes<br>(6)   | Penalties<br>(7)    | Permits<br>(8)      | Quality<br>(9)    | Delays<br>(10)     | State<br>(11)       | Monitoring<br>(12)  |
|--------------------------------|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|---------------------|---------------------|-------------------|--------------------|---------------------|---------------------|
| <i>Variables</i>               |                   |                   |                   |                    |                   |                   |                     |                     |                   |                    |                     |                     |
| Manager_Unknown                | 1.27<br>(1.14)    | -0.159<br>(0.114) | 0.479<br>(0.322)  | -0.012<br>(0.021)  | 0.041<br>(0.209)  | -0.090<br>(0.242) | 0.323<br>(0.214)    | 0.023<br>(0.138)    | 0.035<br>(0.056)  | 0.036<br>(0.027)   | 0.170**<br>(0.066)  | 0.475***<br>(0.151) |
| Manager_FirstContract          | 1.33<br>(1.56)    | 0.031<br>(0.056)  | -0.044<br>(0.508) | 0.044<br>(0.038)   | 0.486<br>(0.346)  | 0.238<br>(0.349)  | 0.188<br>(0.365)    | 0.194<br>(0.204)    | -0.053<br>(0.094) | 0.048<br>(0.038)   | -0.004<br>(0.096)   | 0.071<br>(0.217)    |
| ManagerTenure                  | -0.169<br>(0.254) | -0.037<br>(0.023) | 0.012<br>(0.102)  | -0.002<br>(0.006)  | -0.060<br>(0.053) | -0.064<br>(0.057) | 0.052<br>(0.059)    | 0.006<br>(0.043)    | -0.012<br>(0.016) | 0.005<br>(0.007)   | -0.009<br>(0.015)   | -0.028<br>(0.042)   |
| PastYears                      | -0.463<br>(0.577) | 0.085<br>(0.064)  | -0.146<br>(0.172) | 0.006<br>(0.012)   | -0.013<br>(0.122) | -0.068<br>(0.121) | -0.134<br>(0.112)   | 0.064<br>(0.079)    | -0.026<br>(0.030) | -0.011<br>(0.011)  | -0.084**<br>(0.033) | -0.170**<br>(0.086) |
| PastContracts                  | 0.724<br>(0.570)  | -0.027<br>(0.034) | 0.195<br>(0.278)  | -0.003<br>(0.014)  | 0.241*<br>(0.136) | 0.173<br>(0.154)  | 0.452***<br>(0.132) | -0.214**<br>(0.103) | -0.019<br>(0.034) | 0.032**<br>(0.016) | 0.043<br>(0.038)    | 0.081<br>(0.098)    |
| <i>Fixed-effects</i>           |                   |                   |                   |                    |                   |                   |                     |                     |                   |                    |                     |                     |
| HalfDecade-ContractType        | Yes               | Yes               | Yes               | Yes                | Yes               | Yes               | Yes                 | Yes                 | Yes               | Yes                | Yes                 | Yes                 |
| <i>Fit statistics</i>          |                   |                   |                   |                    |                   |                   |                     |                     |                   |                    |                     |                     |
| Observations                   | 255               | 255               | 255               | 255                | 255               | 255               | 255                 | 255                 | 255               | 255                | 255                 | 255                 |
| R <sup>2</sup>                 | 0.341             | 0.116             | 0.185             | 0.530              | 0.185             | 0.338             | 0.226               | 0.243               | 0.428             | 0.166              | 0.429               | 0.242               |
| Within R <sup>2</sup>          | 0.070             | 0.065             | 0.112             | 0.069              | 0.063             | 0.096             | 0.118               | 0.215               | 0.067             | 0.063              | 0.114               | 0.102               |

*Note:* This table presents the results of a set of linear models estimated via OLS. Only DSP contracts are included in the sample. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "ManagerTenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International municipal corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1

**Table 11:** Results for hypothesis 1, focusing on DSP contracts, including city fixed effects

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Adaptation<br>(2)  | Caretaking<br>(3) | Termination<br>(4)  | Fault<br>(5)      | Disputes<br>(6)   | Penalties<br>(7)   | Permits<br>(8)     | Quality<br>(9)    | Delays<br>(10)    | State<br>(11)     | Monitoring<br>(12) |
|--------------------------------|-------------------|--------------------|-------------------|---------------------|-------------------|-------------------|--------------------|--------------------|-------------------|-------------------|-------------------|--------------------|
| <i>Variables</i>               |                   |                    |                   |                     |                   |                   |                    |                    |                   |                   |                   |                    |
| Manager_Unknown                | 1.31<br>(1.46)    | -0.113<br>(0.091)  | -0.065<br>(0.526) | 0.021<br>(0.026)    | 0.138<br>(0.290)  | -0.107<br>(0.244) | 0.382<br>(0.346)   | 0.145<br>(0.213)   | 0.028<br>(0.085)  | 0.040<br>(0.041)  | 0.138<br>(0.108)  | 0.370*<br>(0.199)  |
| Manager_FirstContract          | 0.870<br>(2.80)   | -0.039<br>(0.098)  | 0.265<br>(0.797)  | 0.010<br>(0.048)    | 0.086<br>(0.579)  | 0.364<br>(0.509)  | 0.088<br>(0.665)   | -0.092<br>(0.459)  | -0.033<br>(0.180) | 0.050<br>(0.067)  | 0.021<br>(0.192)  | 0.209<br>(0.451)   |
| Manager_Tenure                 | -0.208<br>(0.466) | -0.050*<br>(0.028) | -0.092<br>(0.198) | 0.003<br>(0.009)    | -0.115<br>(0.090) | -0.049<br>(0.091) | 0.121<br>(0.112)   | -0.015<br>(0.079)  | -0.007<br>(0.031) | 0.004<br>(0.011)  | -0.012<br>(0.033) | -0.016<br>(0.080)  |
| PastYears                      | -1.43<br>(1.29)   | 0.012<br>(0.049)   | 0.474<br>(0.375)  | -0.064**<br>(0.029) | -0.281<br>(0.253) | -0.103<br>(0.235) | -0.280<br>(0.301)  | -0.384*<br>(0.225) | -0.068<br>(0.077) | -0.015<br>(0.032) | -0.077<br>(0.089) | -0.002<br>(0.171)  |
| PastContracts                  | 2.46<br>(1.67)    | -0.027<br>(0.061)  | -0.018<br>(0.558) | 0.080**<br>(0.032)  | 0.446<br>(0.370)  | 0.387<br>(0.412)  | 0.722**<br>(0.338) | 0.279<br>(0.286)   | 0.056<br>(0.107)  | 0.039<br>(0.049)  | 0.106<br>(0.112)  | 0.036<br>(0.314)   |
| <i>Fixed-effects</i>           |                   |                    |                   |                     |                   |                   |                    |                    |                   |                   |                   |                    |
| HalfDecade-ContractType        | Yes               | Yes                | Yes               | Yes                 | Yes               | Yes               | Yes                | Yes                | Yes               | Yes               | Yes               | Yes                |
| city                           | Yes               | Yes                | Yes               | Yes                 | Yes               | Yes               | Yes                | Yes                | Yes               | Yes               | Yes               | Yes                |
| <i>Fit statistics</i>          |                   |                    |                   |                     |                   |                   |                    |                    |                   |                   |                   |                    |
| Observations                   | 255               | 255                | 255               | 255                 | 255               | 255               | 255                | 255                | 255               | 255               | 255               | 255                |
| R <sup>2</sup>                 | 0.602             | 0.693              | 0.448             | 0.795               | 0.531             | 0.734             | 0.537              | 0.641              | 0.606             | 0.514             | 0.639             | 0.595              |
| Within R <sup>2</sup>          | 0.093             | 0.110              | 0.154             | 0.158               | 0.085             | 0.077             | 0.108              | 0.309              | 0.075             | 0.066             | 0.074             | 0.098              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Only DSP contracts are included in the sample. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "Manager\_Tenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International municipal corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects and city fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*, 0.01, \*\*, 0.05, \*, 0.1

**Table 12:** Results for hypothesis 1 (interacted with dummy for city size)

| Dependent Variables:<br>Model:           | Rigidity<br>(1)   | Adaptation<br>(2) | Caretaking<br>(3) | Termination<br>(4) | Fault<br>(5)        | Disputes<br>(6)   | Penalties<br>(7)     | Permits<br>(8)    | Quality<br>(9)    | Delays<br>(10)     | State<br>(11)       | Monitoring<br>(12) |
|------------------------------------------|-------------------|-------------------|-------------------|--------------------|---------------------|-------------------|----------------------|-------------------|-------------------|--------------------|---------------------|--------------------|
| <i>Variables</i>                         |                   |                   |                   |                    |                     |                   |                      |                   |                   |                    |                     |                    |
| Manager_Unknown                          | 0.429<br>(1.03)   | -0.046<br>(0.050) | 0.232<br>(0.329)  | -0.029<br>(0.021)  | -0.326<br>(0.238)   | -0.104<br>(0.197) | 0.287<br>(0.187)     | -0.044<br>(0.127) | -0.025<br>(0.062) | 0.037<br>(0.026)   | 0.131**<br>(0.061)  | 0.217<br>(0.158)   |
| Manager_FirstContract                    | -0.407<br>(1.81)  | 0.172<br>(0.175)  | -0.296<br>(0.543) | 0.008<br>(0.040)   | -0.010<br>(0.387)   | 0.027<br>(0.419)  | 0.002<br>(0.333)     | 0.084<br>(0.226)  | -0.121<br>(0.095) | -0.020<br>(0.042)  | -0.099<br>(0.101)   | -0.067<br>(0.249)  |
| Manager_Tenure                           | -0.237<br>(0.246) | -0.011<br>(0.018) | 0.014<br>(0.083)  | -0.002<br>(0.006)  | -0.124**<br>(0.057) | -0.052<br>(0.049) | 0.035<br>(0.052)     | 0.0008<br>(0.037) | -0.017<br>(0.014) | 0.002<br>(0.007)   | -0.020<br>(0.014)   | -0.042<br>(0.043)  |
| PastYears                                | -0.428<br>(0.481) | 0.045<br>(0.064)  | -0.030<br>(0.116) | 0.009<br>(0.010)   | 0.012<br>(0.114)    | -0.102<br>(0.103) | -0.190***<br>(0.066) | 0.009<br>(0.055)  | -0.007<br>(0.027) | -0.021*<br>(0.011) | -0.066**<br>(0.027) | -0.069<br>(0.081)  |
| PastContracts                            | 0.413<br>(0.656)  | -0.007<br>(0.036) | 0.093<br>(0.243)  | -0.017<br>(0.013)  | 0.117<br>(0.166)    | 0.235<br>(0.151)  | 0.371***<br>(0.104)  | -0.107<br>(0.085) | -0.038<br>(0.038) | 0.020<br>(0.016)   | 0.014<br>(0.034)    | 0.047<br>(0.099)   |
| Manager_Unknown $\times$ SmallCity       | 0.909<br>(1.78)   | 0.058<br>(0.200)  | -0.112<br>(0.465) | 0.023<br>(0.034)   | 0.431<br>(0.381)    | 0.013<br>(0.347)  | -0.056<br>(0.283)    | 0.085<br>(0.193)  | 0.049<br>(0.100)  | 0.004<br>(0.042)   | 0.035<br>(0.102)    | 0.140<br>(0.250)   |
| Manager_FirstContract $\times$ SmallCity | 0.512<br>(2.14)   | -0.178<br>(0.266) | 0.285<br>(0.470)  | 0.002<br>(0.040)   | 0.188<br>(0.451)    | -0.084<br>(0.481) | -0.139<br>(0.339)    | -0.148<br>(0.222) | 0.117<br>(0.103)  | 0.018<br>(0.046)   | 0.090<br>(0.108)    | 0.274<br>(0.249)   |
| <i>Fixed-effects</i>                     |                   |                   |                   |                    |                     |                   |                      |                   |                   |                    |                     |                    |
| HalfDecade-ContractType                  | Yes               | Yes               | Yes               | Yes                | Yes                 | Yes               | Yes                  | Yes               | Yes               | Yes                | Yes                 | Yes                |
| <i>Fit statistics</i>                    |                   |                   |                   |                    |                     |                   |                      |                   |                   |                    |                     |                    |
| Observations                             | 398               | 398               | 398               | 398                | 398                 | 398               | 398                  | 398               | 398               | 398                | 398                 | 398                |
| R <sup>2</sup>                           | 0.382             | 0.101             | 0.267             | 0.424              | 0.183               | 0.392             | 0.439                | 0.478             | 0.321             | 0.252              | 0.379               | 0.192              |
| Within R <sup>2</sup>                    | 0.110             | 0.051             | 0.099             | 0.117              | 0.089               | 0.077             | 0.139                | 0.154             | 0.065             | 0.093              | 0.140               | 0.096              |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on the LTC-IDF method described in Section 3.2. The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. It is interacted with a dummy variable indicating whether the city has less than 60,000 inhabitants. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "Manager\_Tenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*, 0.01, \*\*, 0.05, \*, 0.1

**Table 13:** Results for Hypothesis 1 using [Beuve et al. \[2019\]](#) rigidity scores

| Dependent Variables:<br>Model: | Rigidity<br>(1)   | Termination<br>(2) | Arbitration<br>(3) | Penalties<br>(4)  | Certifications<br>(5) | Evaluation<br>(6)  | Litigation<br>(7) | Contingencies<br>(8) |
|--------------------------------|-------------------|--------------------|--------------------|-------------------|-----------------------|--------------------|-------------------|----------------------|
| <i>Variables</i>               |                   |                    |                    |                   |                       |                    |                   |                      |
| Manager_Unknown                | -1.15<br>(1.82)   | -0.721<br>(0.448)  | 0.390<br>(0.431)   | -0.086<br>(0.442) | -0.352<br>(0.347)     | -0.325<br>(0.512)  | 0.051<br>(0.517)  | 0.172<br>(0.357)     |
| Manager_FirstContract          | 2.63<br>(3.00)    | 0.590<br>(0.707)   | -0.365<br>(1.02)   | 0.756<br>(0.682)  | 0.931*<br>(0.500)     | 0.316<br>(0.830)   | -0.564<br>(0.700) | 0.829<br>(0.740)     |
| ManagerTenure                  | -0.444<br>(0.578) | 0.228<br>(0.141)   | -0.208<br>(0.129)  | -0.012<br>(0.148) | -0.171<br>(0.111)     | -0.101<br>(0.174)  | -0.141<br>(0.154) | -0.020<br>(0.112)    |
| PastYears                      | 0.483<br>(1.18)   | 0.305<br>(0.236)   | -0.495<br>(0.402)  | -0.085<br>(0.236) | 0.378**<br>(0.170)    | 0.283<br>(0.345)   | 0.119<br>(0.234)  | -0.140<br>(0.263)    |
| PastContracts                  | -1.09<br>(1.43)   | 0.001<br>(0.297)   | 0.133<br>(0.280)   | 0.296<br>(0.251)  | -0.635**<br>(0.266)   | -0.729*<br>(0.413) | -0.599<br>(0.462) | 0.623**<br>(0.311)   |
| <i>Fixed-effects</i>           |                   |                    |                    |                   |                       |                    |                   |                      |
| HalfDecade-ContractType        | Yes               | Yes                | Yes                | Yes               | Yes                   | Yes                | Yes               | Yes                  |
| <i>Fit statistics</i>          |                   |                    |                    |                   |                       |                    |                   |                      |
| Observations                   | 403               | 403                | 403                | 403               | 403                   | 403                | 403               | 403                  |
| R <sup>2</sup>                 | 0.346             | 0.167              | 0.240              | 0.350             | 0.210                 | 0.298              | 0.149             | 0.173                |
| Within R <sup>2</sup>          | 0.162             | 0.080              | 0.120              | 0.089             | 0.107                 | 0.142              | 0.074             | 0.109                |

*Note:* This table presents the results of a set of linear models estimated via OLS. Dependent variables are rigidity scores based on [Beuve et al. \[2019\]](#). The main variable of interest is "Manager\_Unknown", which is equal to one if the company and the municipality have interacted in the past, but never with this current set of managers. "Manager\_FirstContract" is a dummy equal to one if the contract signed was the first in the city-company relationship. "ManagerTenure" is the natural log of the number of years since the first appearance of the manager(s) in the data. "PastYears" and "PastContracts" indicate the number of years and contracts respectively since the municipality and the company have first interacted. Additional control variables for which coefficients are not included are: a dummy indicating whether the contract was renewed, a dummy indicating whether the contract was ended at the end of the observation period (2009), a type of contract (MP or DSP) dummy variable, the log of the city population at the closest census, a categorical variable indicating whether the parking lot was built under, on or above ground, political ideology of the mayor dummy variables, a Transparency International corruption index, and a dummy indicating whether the contract involved construction. All specifications contain type specific time fixed effects. Std errors clustered at the city  $\times$  time level. Signif. Codes: \*\*\*: 0.01, \*\*: 0.05, \*: 0.1