Rigidity of Public Contracts*

Marian Moszoro[1], Pablo T. Spiller[2], and Sebastian Stolorz[3]

[1]University of California, Berkeley and Kozminski University
[2]University of California, Berkeley and NBER
[3]George Mason University and the World Bank

August 25, 2014

Abstract

We apply algorithmic data reading and textual analysis to compare the features of contracts in regulated industries subject to public scrutiny (which we call "public contracts") with relational private contracts. We show that public contracts are lengthier and have more rule-based rigid clauses; in addition, their renegotiation is formalized in amendments. We also find that contract length and the frequency of rigidity clauses increases in political contestability and closer to upcoming elections. We maintain that the higher rigidity of public contracts is a political risk adaptation strategy carried out by public agents attempting to lower third-party opportunistic challenges.

JEL Classification: D23, D73, D78, H57, K23

Keywords: Transaction Costs, Public Contracting and Procurement, Political Economy, Regulated Industries

*This research received financial support from the Jeffrey A. Jacobs Distinguished Professor of Business and Technology Chair at the Haas School of Business, University of California, Berkeley and IESE's Public-Private Sector Research Center. Data from SEC's EDGAR database, CORI K-Base, Wharton Research Data Services (WRDS), and the CQ Voting and Elections Collection are gratefully acknowledged. We thank the participants in the presentations made at the NBER Summer Institute, Duke University, University of California, Berkeley (Haas), California Polytechnic State University (San Luis Obispo, CA), FGV (Rio de Janeiro), National Research University-Higher School of Economics (Moscow), Université Paris-Sorbonne (Chaire EPPP), Université Paris-Dauphine/European University Institute (ISNIE 2013), and the World Bank for their comments. We are particularly indebted to Emmanuelle Auriol, Oliver Hart, Jack Gansler, Ricard Gil, Paul Grout, Jeremy Mayer, Edward Rhodes, Stéphane Saussier, Giancarlo Spagnolo, and Joao Veiga Malta for their helpful suggestions and to Scott Masten for his extensive review of an early version of this paper.

Contracting is at the basis of every economic activity and has been an important subject of study at law, economics, and business schools. Yet scant empirical studies have examined contract features of large samples of contracts (Schwartz and Scott 2010).

Previous—mostly theoretical—works have focused on contract completeness (Schwartz and Scott 2003; Shavell 2006), particularly contract interpretation. The cost of writing a contract increases with the number of contingencies addressed in the contract (Dye 1985). Incompleteness arises endogenously from an insufficient description of the parties' behavior (i.e., discretion) and insufficient contingency of the parties' obligations to external states—that is, rigidity (Battigalli and Maggi 2002). The costs of designing optimal complex contracts can be prohibitively expensive for the involved parties. Enforcing such contracts can also be costly. Therefore, involved parties often prefer to use simple contracts (Schwartz and Watson 2004). A positive correlation exists between complexity (e.g., measured by contract length) and the probability that parties choose arbitration over court litigation (Drahozal and Hylton 2003; Drahozal and Ware 2010).

The empirical analysis of contracts presents two challenges: the dearth of explanatory variables and the subtle contract variations arising from the interaction of terms. A series of contracting papers published beginning in the mid-1980s addressed these hindrances. Joskow (1985, 1987) analyzed vertical integration, contract duration, and relation-specific investments based on contracts between coal suppliers and electric utilities. Masten and Crocker (1985, 1988, 1991) examined the tradeoffs between the design and duration under price regulation and the processes by which parties adjust prices in long-term contracts to encourage flexibility and avoid opportunism in the production of onshore natural gas wells. Crocker and Reynolds (1993) studied the optimal degree of contractual incompleteness in pricing procedures used in Air Force engine procurement contracts. Lafontaine (1992, 1993) explored the determinants of franchise agreements under risk sharing and moral hazard in various business activities. Masten and Snyder (1993) analyzed the use of specific lease provisions to supply quality equipment without the need for comprehensive contracting in the shoemaking industry. Leffler and Rucker (1991) investigated the incentives associated with lump-sum (transaction costs-covering) and per unit payment (risk-sharing) provisions in timber-harvesting contracts. Similarly, Allen and Lueck (1992, 1993) looked at cash rent versus cropshare agricultural contracts. Yet these studies, with a few exceptions, focused on particular sectors, were geographically restricted,

and were based on a limited number of observations.[1] In most cases, contractual attributes were identified as dummy or ordered variables.

Schwartz and Watson (2012) tackled the question of which institutional environment demonstrates a preference for arbitration. Arbitration is less costly than court trials, but requires more accurate contracts. These authors provided a model, supported by empirical evidence using a large set of contracts filed through the Stock and Exchange Commission (SEC), in which a welfare-maximizing enforcer induces the contracting parties to make socially efficient trade-offs between interpretation accuracy and cost of contract writing—namely, between the trial cost and investment in the deal.

Spiller (2008) and Moszoro and Spiller (2012) presented a complementary rationale for public contracts' rigidity in politically contestable markets. Even if the enforcer is a welfare maximizer, the public agent is subject to political hazards. Therefore, public contracts are more rigid—have more rule-based "explicit" terms—than purely private contracts as a political risk adaptation of the public agent to keep at bay plausible challenges by third parties. The increased cost of rigidity is externalized to the public at large.

Strong anecdotical evidence indicates the rigidity of public contracts, but no comprehensive empirical study exists. Our approach is similar to that of Schwartz and Watson (2012) in that we use the same data source (SEC filings) and analogous algorithmic data reading, but our study differs in its controls, treatment, and testable predictions. Using data scraping and word clustering from more than 200,000 contracts across all states and a wide variety of industries filed through the SEC's Electronic Data-Gathering, Analysis, and Retrieval (EDGAR) system, we test Moszoro and Spiller's (2012) hypothesis of higher rigidity of public contracts compared with the rigidity of purely private contracts.

1 A Model of Contractual Rigidity[2]

Contracting cost rises exponentially with contract rigidity and determines the trade-off between interpretation accuracy and the cost of contract writing, as shown by Schwartz and Watson

[1] With the exception of Allen and Lueck (1992, 1993), who collected an impressive survey of 1,628–3,432 agricultural contracts, and Lafontaine (1992, 1993), who relied on a cross-section of 548 contracts, these studies were based on datasets that included from 44 to 299 observations.

[2] This section follows Moszoro and Spiller (2012).

(2012).

In Spiller (2008), the lack of flexibility in public procurement design and implementation reflects public agents' political risk adaptation aimed at limiting the hazards from opportunistic third parties—political opponents, competitors, interest groups—while externalizing the associated adaptation costs to the public at large. Following Moszoro and Spiller (2012), we assume that public agents minimize both contracting and political costs given by:

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

where $K(R)$ is adaptation costs rising exponentially with contract rigidity, ρ is the likelihood of a challenge by an opportunistic third party and τ is the likelihood of success of an opportunistic challenge (both decreasing with contract rigidity), and T_0 is the public agent's (political) cost if a challenge by third parties is successful. Third parties observe benefits from opportunistic challenge, but the public agent does not know *ex ante* the particular value of these benefits for third parties. Third parties' overall benefits from an opportunistic challenge correspond to a random normally distributed variable $\widetilde{T_0}$.

Moszoro and Spiller (2012) showed that in equilibrium third parties challenge a contract only if expected gains $\widetilde{T_0}\zeta\tau$ are greater than litigation costs $c(R)$:

$$\rho \equiv \Pr[\widetilde{T_0}\zeta\tau(R) > c(R)], \tag{2}$$

where $\zeta \in (0, 1]$ is a political concentration parameter: if $\zeta = 1$, the TPO challenger's benefits are symmetrical to the incumbent public agent's TPO costs (e.g., a bipartisan political market); if $\zeta < 1$, the political market is fragmented and the challenger does not internalize all benefits from a successful contract protest.

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

(a) If $R < R^*$, then $\tau(R) > \tau(R^*), c(R) < c(R^*)$, therefore $\rho > \rho^*$ and $T_0\ \rho(R)\tau(R) - T_0\ \rho(R^*)\tau(R^*) > K(R^*) - K(R)$ (political cost increase offsets gains in contracting cost decrease)

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

Moszoro and Spiller (2012) derive two testable predictions on the contractual design depending on the characteristics of the contracting parties:

Prediction 1 *Equilibrium contract rigidity increases in political costs; thus, contracts subject to public scrutiny show more rigidity clauses than purely private (i.e., relational) contracts.*

Prediction 2 *In the sub-sample of public contracts, rigidity increases with political contestability (high ζ).*

2 Data and Methodology

2.1 SEC's EDGAR Database

All public companies operating in the U.S., both foreign and domestic, are required to file registration statements, periodic reports, and other forms electronically through the SEC's EDGAR system. The required disclosure filings made by publicly traded companies frequently contain contracts that are of material interest to investors. Filing requirements for compliance with SEC's regulations are described in Overdahl (1991).[3] Although this information is available to the public, research on contracting has been stymied by a lack of parametrization.

We used the directEDGAR engine developed by Burch Kealey from the University of Nebraska at Omaha to extract all data in Exhibit 10 from the 10-K filings filed from 1998 to 2013. The following subsections describe the data treatment step by step.

2.2 Data Treatment

Step 1: Rough Data

An issuer must file an Exhibit 10 to a registration statement and periodically report "material contracts" described in items 601(b)(10) of Regulation S-K and Regulation S-B. Examples of different types of material contracts include: asset purchase agreements; bridge loan agreements, cash bonus plans, director fee agreements, director indemnification plans, employment agreements, executive compensation plans and incentive plans, financial services agreements, joint venture agreements, lease agreements, letters of intent, license agreements, pension plans, profit sharing plans, purchase agreements, stock option agreements, stock purchase agreements, and termination agreements.

[3] A modern index to forms is available at: http://www.sec.gov/ info/edgar/forms/edgform.pdf.

We retrieved material contracts through directEDGAR, which collects data from the SEC's FTP server. The data in this system consists of electronic filings by corporations and individual filers to the SEC. We used the form type index to identify Exhibit 10 documents included with the filing of forms 10-K, which require the inclusion of material contracts, and then retrieved each Exhibit 10 from the location indicated in the filing index.

We retrieved 206,677 contracts dated from 1998 to 2013 and translated all files to machine-readable ASCII text format.[4] We measured contract length by the geometric average of the word count of three common English words: "the", "and", and "of". We then used the natural logarithm of character count for file length normalization.

Step 2: Company Identification

We identified each filing company by the SEC's Central Index Key (CIK) and linked it to the company's ticker, Standard Industrial Classification (SIC) code, location, and financial characteristics retrieved from the Wharton Research Data Services (WRDS).[5] We dropped 26,282 filings to which no CIK or SIC code was associated.

Step 3: Public versus Private

We classified the contracts as *"Utilities"* and *"Quasi-regulated"* (i.e., where one public agency, state, county, or municipality is involved) versus purely *"Private"* using the SIC code[6] of the filing party. Unfortunately, we were not able to identify non-reporting contractees.

(a) Filing companies whose SIC code begins with 6 (Finance) and 9 (Administration) were filtered out

(b) *"Utilities":* filing companies whose SIC code is between 4900 and 4999—namely, electric, gas and sanitary services, electric services, natural gas transmission, natural gas transmission and distribution, natural gas distribution, electric and other services combined, gas

[4] Although EDGAR was launched in 1994, filings from early years are random and incomplete. To increase the reliability of our data, we collected contracts from 1998 onwards.

[5] See http://www.sec.gov/edgar/searchedgar/cik.htm and http://www.sec.gov/edgar/searchedgar/companysearch.html (accessed on September 24, 2012) for a list of CIK and SIC codes.

[6] See, e.g., Matsumoto (2002) for a treatment of SIC codes regarding regulation. We modified his treatment and classified companies whose SIC code is between 4800 and 4899 as *"quasi-regulated industries"*. See http://www.sec.gov/info/edgar/siccodes.htm (accessed on September 24, 2012) for the SIC Code List description.

and other services combined, water supply, sanitary services, refuse systems, hazardous waste management, steam and air-conditioning supply,[7] and cogeneration services and small power producers.

(c) *"Quasi-regulated industries":* filing companies whose SIC code is between 4000 and 4499 and between 4800 and 4899—namely, railroad switching and terminal establishments, local and suburban transit, interurban highway passenger transportation, trucking and courier services (no air), trucking (no local), public warehousing and storage, terminal maintenance facilities for motor freight transport, water transportation, deep sea foreign transportation of freight, telephone communications (no radiotelephone), telegraph and other message communications, radio broadcasting stations, television broadcasting stations, cable and other pay television services, and communication services.

(d) *"Private":* filing companies whose SIC code starts with 1, 2, 3, 5, 7, or 8 and whose SIC code is between 4500 and 4799.

Public utilities provide and maintain the infrastructure for key public services—electricity, natural gas, water, and sewage. In the U.S. private public utilities are subject to public regulation ranging from local community to statewide: government control through a public utility commission.[8]

We distilled 20,200 public contracts and 123,543 private contracts.

Step 4: Word Count and Categorization

We used Schwartz and Watson's (2012) keyword list of arbitration clauses—arbitration (and variants), whereas, court, appeal, mediation, litigation, warranty, guaranty, specification, and deposition—as the starting point and complemented the list with 21 keywords, grouped them into seven rigidity categories: arbitration, certification, evaluation, litigation, penalties, termination, and design.

In textual analysis and computer science, these categories are referred to as "dictionaries."

[7] For the sake of clarity, SIC code 4961: Steam and Air-conditioning Supply refers to utilities engaged in the production and/or distribution of steam and heated or cooled air for sale, not to commercial and industrial air-conditioning equipment. Its equivalent NAICS Code is 221330. For a manual of SIC codes, see: https://www.osha.gov/pls/imis/sic_manual.html.

[8] For public scrutiny and accountability in the contracting practice at a water utility, see Appendix A.

We used them to "teach" our software to machine-read contractual categories. Our use of categories is analogous to Parkhe's (1993) efforts in the management literature concerning contract analysis and to Loughran and McDonald's (2011) work in the finance and accounting literature dealing with corporate filings. In a small contract sample, Parkhe (1993) used dummy variables equal to one when specific clauses—written reports of relevant transactions, promptly written notice of departures from the agreement, the right to examine and audit relevant records using a firm of certified public accountants, designation of certain information as proprietary and subject to confidentiality provisions of the contract's non-use of proprietary information even after termination of the agreement, termination of agreement, arbitration clauses, and lawsuit provisions—were contained in a contract. Loughran and McDonald (2011) applied word counts of negative words, positive words, uncertainty words, litigious words, strong modal words, and weak modal words in a large number of SEC filings.

Arbitration clauses submit plausible disputes to an arbitrator instead of a court. Certification clauses regulates the contractor. Evaluation clauses introduce duties regarding delivery. Litigation clauses appear in triggers to a lawsuit. Termination clauses signal ways to resolve intractable contract disruption. Finally, design clauses impose product or service features.

We conjecture, following Spiller (2008) and Moszoro and Spiller (2012), that these rigidity categories capture relevant contractual clauses that lower the likelihood of a challenge by opportunistic third parties. Our rationale for (and contribution to) the use of rigidity categories instead of the use of a simple aggregate is to open the black box on contractual rigidity and assess its magnitude and significance at a granular level.

We developed an keyword count by data scraping. Table (1) presents keywords clustered in rigidity categories.

Overall, we counted 5,644,668 keywords: arbitration 396,178; certification 872,843; evaluation 1,304,934; litigation 289,750; penalties 773,392; termination 1,940,419; and design 67,152.

Step 5: Descriptive Categories

We scraped keywords contained in the first 100 lines of the filings to identify the type of contract, as presented in Table (2). We identified these types for 126,913 filings: amendment 96,552; commercial contracts 54,344; compensation/employment 88,238; consulting 4,559; and finance 50,492. This categorization is not unique for each contract, meaning our identified

categories overlap. Indeed any type of contract may be subject to amendments.

Our focus is on commercial contracts. We adopted a cautious approach, in which we identify as commercial contracts only those that do not share attributes with compensation/employment, consulting, or finance descriptive categories. Finally, we processed 7,190 commercial contracts, out of which we identified 1,808 as license contracts and 5,382 as sale/procurement contracts.[9]

Our identification of amendments by keywords in the document heading may capture primary contracts with an "integration" (also known as "merger" or "entire agreement") clause.[10] Integrated agreements, however, are a formal amendment for the purposes of this research and does not affect our results.

Table (3) presents the summary of the dataset construction step by step, and Tables (4) and (5) present the characterization and summary statistics of the output dataset of commercial contracts.

3 Contract Features and Hypotheses

The contract features that we use as proxies of complexity are: length, clusters of rigidity clauses, and number of amendments to contracts. Descriptive categories are used as control variables for fixed effects. We were unable to extract the duration and value of the contracts.

We advance the following hypotheses:

Hypothesis 1 *Public contracts are lengthier than private contracts.*

Hypothesis 2 *Public contracts have more rigidity clauses than private contracts.*

Hypothesis 3 *Public contracts are renegotiated through formal processes and, thus, have more amendments than private contracts; in addition, public contracts' amendments include more rigidity clauses than private contracts' amendments.*

[9] These contracts are commonly agreements related to the ongoing business activities, not only one-time events as, for example, the construction of a generation plant for an electric utility.

[10] An example of an integration clause is provided below:

> This is the entire agreement between the parties. It replaces and supersedes any and all oral agreements between the parties, as well as any prior writings. Modifications and amendments to this agreement, including any exhibit or appendix, shall be enforceable only if they are in writing and are signed by authorized representatives of both parties.

Figure (1) maps these hypotheses graphically.

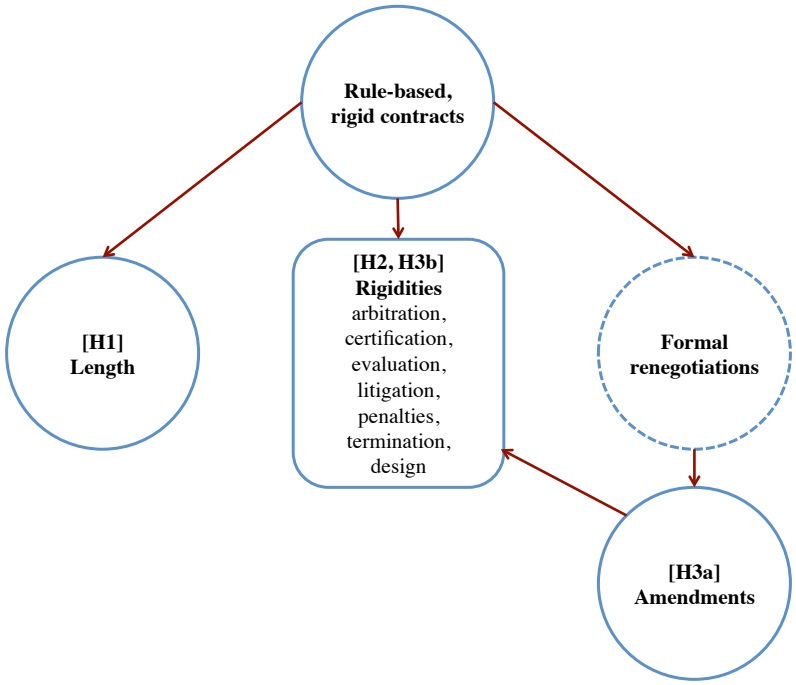


Figure 1: Hypotheses and research approach

4 Identification Strategy

As "predictors" of complexity of public contracts, we used length (hypothesis (1)) and frequency of rigidity clauses (hypothesis (2)). We tested these hypotheses with OLS regressions for contract length and for rigidity category as described in equations (3) and (4), respectively:

$$Length_i = \alpha_0 + \alpha_1 Utilities_i + \alpha_2 Quasi_regulated_i + Controls_i + \varepsilon_i \tag{3}$$

$$Rigidities_{i,l} = \alpha_0 + \alpha_1 Utilities_i + \alpha_2 Quasi_regulated_i + Controls_i + \varepsilon_i \tag{4}$$

where i is the contract index, $Utilities_i$ is a dummy variable that is equal to 1 when the contract i is a utilities contract and 0 otherwise, $Quasi_regulated_i$ is a dummy variable that is equal to 1 when the contract i is a quasi-regulated contract and 0 otherwise (thus when both $Utilities_i$ and $Quasi_regulated_i$ equal zero, it is a private-to-private contract), $Length_i$ is the length of contract i,[11] and $Rigidity_{i,l}$ is the frequency of rigidity keywords clustered in clauses

[11] We proxied contract length by the geometric average of the count of the three most frequent words in English—"the", "and", and "of"—to circumvent the different formats of the filings and to cut outliers.

l—arbitration, certification, evaluation, litigation, penalties, termination, and design as shown in table (1)—calculated as the natural logarithm of the count of rigidity keywords divided by $Length$ of file i:

$$Rigidity_{i,l} = ln \frac{\text{Count of keywords of rigidity clause } l \text{ in file } i}{Length_i} \tag{5}$$

We controlled for total assets, capital expenditure, and sales; type of contract (license or sale/procurement); and industry (one-digit SIC), state, and year fixed effects. We also checked our results by filtering for long contracts only (without low decile filings in length). We applied log transformations to normalize skewed and wide distributions as well as provide a straightforward interpretation of our coefficients in relative terms.

To test hypothesis (3), we applied logit regressions of amendments on contract characteristics, controlling for contract length, sales, and state fixed effects, as specified in equation (6), and OLS regressions of the average number of amendments to total documents at the firm k level, as specified in equation (7):

$$Amendment_i = \alpha_0 + \alpha_1 Utilities_i + \alpha_2 Quasi_regulated_i + \alpha_3 Length_i + Controls_i + \varepsilon_i \tag{6}$$

$$\frac{\sum_i Amendment_{i,k}}{\sum_i Amendment_{i,k} + \sum_i Main_{i,k}} = \alpha_0 + \alpha_1 Utilities_i + \alpha_2 Quasi_regulated_i + \alpha_3 Length_i + Controls_i + \varepsilon_i \tag{7}$$

In addition, we tested for rigidity clauses in amendments with analogous OLS equations to equation (4), filtering for amendments, as shown in equation (8):

$$(Rigidities_{i,l} \mid Amendment_i = 1) = \alpha_0 + \alpha_1 Utilities_i + \alpha_2 Quasi_regulated_i + Controls_i + \varepsilon_i \tag{8}$$

5 Empirical Results

We found that utility contracts are lengthier, have more arbitration, evaluation, litigation, and penalty clauses, and have more amendments with more arbitration, evaluation, and penalty clauses than private contracts. Contracts in quasi-regulated industries are not significantly lengthier, but in some cases incorporate more penalty and design clauses than private contracts.

Table (6) shows the unconditional mean lengths of public utilities, quasi-regulated, and private contracts, and Table (7) shows the length mean-comparison t-test of public versus private contracts. On average, public contracts are lengthier than private contracts.

Table (8) presents results of OLS regressions of main contract length on contract attributes: public utilities and quasi-regulated versus private industry dummies, controlling for industry (one-digit SIC) fixed effects and excluding short filings (without the bottom 10% in terms of length). It shows that contracts are significantly lengthier when the filing entity is a public utility. Also, we cannot statistically reject the hypothesis that contracts of quasi-regulated companies are lengthier than private contracts.

Tables (9), (10), and (11) show results of OLS regressions of rigidity clauses on contract characteristics. Public utilities contracts feature more rigidity clauses than private contracts. In our general specification, public contracts feature more arbitration, evaluation, litigation, and penalty clauses. Negative coefficients of contractual rigidity clauses are statistically insignificant.

As our variables are log-transformed on both sides, length estimates show the length *elasticity* of rigidity clauses. An increase in length is associated with more, but less frequent appearances of, rigidity clauses.

The fact that certification and design clauses do not appear to be statistically significant reinforces our rationale and excludes possible contract tailoring: Too specific certification and design could indicate "designative" or "tailored" specifications—that is, point to a specific contractor and be the source of favoritism (Lambert-Mogiliansky and Kosenok 2009).

Tables (13) and (14) show that the likelihood of an amendment is higher for public utilities and companies in quasi-regulated industries and that that average number of amendments clustered at the company level is higher for public utilities. Table (15) shows that amendments in public utilities contracts feature more arbitration, evaluation, litigation, and termination clauses than in private contract amendments. We conjecture that public contracts are renegotiated formally through amendments instead of relationally.

6 Robustness Check: Flexibility Words

Flexible clauses shift the emphasis of the contractual relationship from a detailed specification to adaptive terms in the face of changing circumstances (Goldberg 1976). Therefore, relational long-term contracts (e.g., public utilities contracts) should show more flexible provisions to facilitate efficient adjustments that subdue the costs of plausible opportunistic renegotiations (Crocker and Masten 1991).

To compare this view with ours, we counted words that introduce flexibility clauses: *satisfactory, timely, good faith, diligent, proper, reasonable, reasonably*, and *unreasonably.* Next, we tested whether these clauses better explain the contractual differences between public and private contracts.[12]

Table 12 presents results of several regression specifications of flexibility words on contract characteristics. We found that public and private contracts use flexibility clauses to the same extent. This could suggest that public contracts are more state-contingent than private contracts—namely, equally flexible, but severely limited in the form revisions can take (Hart and Moore 1988).

7 Contractual Response to Political Contestability

Political contestability is the "extent to which a collective political actor or a system of such political actors possesses attributes, resources, positions, or other factors, in themselves or in their environments, that promote the ability to compete effectively in the political process" (Mitnick 1993, 12). If a political system is characterized by contestability, then it is rational for interest groups to petition the government on behalf of their members (Getz 1997). In fact, in the U.S. and other democracies, interest groups do convey the concerns of their members to government officials and, thus, are a means by which citizens can influence government (Mundo 1992).

A contract is politically contestable when contractual decisions are subject to influence by potential (opportunistic) challengers.[13] If the political opposition is fragmented (low ζ), benefits from a challenge can go to any of the political competitors, not necessarily to the challenger who bears the cost of challenge c in equation (2). Public agents will respond to higher political contestability with higher contractual rigidity to reduce the likelihood of a challenge (Moszoro and Spiller 2012).

Analogously to our previous hypotheses, we test within the regulated and quasi-regulated contracts sample the following hypothesis:

[12] We are thankful to Scott Masten for suggesting this test and set of words.

[13] In Capitol Hill jargon, political contestability is usually referred to as the "Washington Post test," a commonly used phrase in D.C. when working on a project—"How would it look on the front page of the *Washington Post*?"

Hypothesis 4 *In politically contestable markets, public contracts:*

(a) are lengthier,

(b) have more rigidity clauses, and

(c) are renegotiated through formal processes and, thus, have more amendments than in less politically contestable markets.

8 Evidence of Political Contestability

We used the outcome of general elections for state governors to compute the measures of political contestability that might affect public contracts.[14] We assembled a dataset of general gubernatorial elections from 1980 to 2013 for all 50 U.S. states from the CQ Voting and Elections Collection (2014). The time span of the political series is larger to account for cumulative swings in the governmental administration at the time of signing the contract. Next, we interpolated the last election outcome for non-election years and merged the resulting dataset with the subsample of public—utilities and quasi-regulated—contracts by state and year. Finally, we included a "year in office" variable equal to the difference between the contract year and the last election year plus one, thereby defining the tenure of the governor at the time of signing the contract.

We defined several complementary measures of political contestability:

$$Winning\ margin_{z,t} = |A_{z,t} - B_{z,t}| \tag{9}$$

$$Small\ winning\ margin_{z,t} = \begin{cases} 1 & \text{if} \quad |A_{z,t} - B_{z,t}| < \lambda \\ 0 & \text{if} \quad \text{else} \end{cases} \tag{10}$$

where $A_{z,t}$ and $B_{z,t}$ are the winning and runner-up parties' vote shares respectively in district z at time t, and λ is an *a priori* threshold for political contestability (usually 10% in the U.S.), all in percentage points. In addition:

$$Political\ opposition\ strength_{z,t} = \frac{B_{z,t}^2 + C_{z,t}^2 + D_{z,t}^2 + \dots}{1 - A_{z,t}} \tag{11}$$

which measures the strength of the political opposition using the Herfindahl-Hirschman Index (HHI) of residual (non-winning) parties' vote share weighted by the overall non-winning vote

[14] We are thankful to Jeremy Mayer and Edward Rhodes for their insights on the mechanisms of American politics.

share in general elections in district z at time t. We expect the winning margin coefficients to be negative and the small winning margin and political opposition strength coefficients to be positive.

Using public contracts, we tested hypothesis (4) by running in-sample regressions using our measures of political contestability:

$$Length_{i,t} = \alpha_0 + \alpha_1 PC_{i,t} + Controls_i + \varepsilon_{i,t} \tag{12}$$

$$Rigidities_{i,l,t} = \alpha_0 + \alpha_1 PC_{i,t} + Controls_i + \varepsilon_{i,t} \tag{13}$$

$$Amendment_{i,t} = \alpha_0 + \alpha_1 PC_{i,t} + \alpha_2 Length_i + Controls_i + \varepsilon_{i,t} \tag{14}$$

$$(Rigidities_{i,l,t} \mid Amendment_{i,t} = 1) = \alpha_0 + \alpha_1 PC_{i,t} + Controls_i + \varepsilon_{i,t} \tag{15}$$

where i is the contract index, $PC_{i,t}$ are our political contestability variables (equations 9–11) in contract i matched by the state code and year, and $Length_i$ and $Rigidity_{i,l}$ are as defined in section 4. We control for type of contract and state fixed effects.

Table (16) presents results from OLS cross-section regressions of contract length in the subsample of public contracts on political contestability variables. We found that public contract length rises in political contestability when controlling for state fixed effects: As expected, winning margins are inversely correlated with contract length and contract length increases when winning margins are narrow (i.e., the winning margin is below 10%) and the concentration of the political opposition is strong. The fact that political contestability variables are significant only when controlling for state fixed effects might indicate that they have a strong predicting power for time-varying political contestability within states, but not across states.[15]

In political practice, the first and second year in office are "warming-up years"; the third year can be portrayed as the "working year" that will capitalize during the fourth and last year—the "elections race year". Accordingly, we found a significant increase in contract length in governors' third year of tenure in office, which might suggest that politicians are more careful in crafting their contracts to avoid political challenges.

Tables (17) and (18) show the results of OLS cross-section regressions of frequency of rigidity clauses in the subsample of public contracts on winning margins and winning margin

[15] The 16-year time period of our contracts sample overlaps with on average 4.4 governmental elections—spanning from four elections for 36 states to eight elections in New Hampshire and Vermont, which hold governmental elections every two years. Thus, our political dataset captures sufficient within-state political variation.

dummies. The data indicate that increased political contestability increases the frequency of the appearance of arbitration and litigation clauses in public contracts. Interestingly, the political contestability effect is augmented when we regress only those states where the Republican Party won by a narrow margin, as shown in Table (19), panels A and B. This could suggest that the Republican Party is more sensitive to political risks, while the Democratic Party is more concerned about the agenda.

In unreported regressions, we also checked the sum, time-weighted, and average of partisan swings in the previous three elections at each year, as well as the winning margin squares for non-linear effects, but found that these variables are not explanatory of public contracting at the state level. We do not claim that our choice of political contestabiity variables is unique across all administrations. The set of variables that capture political contestability effects in a particular market may vary across countries and—within countries—across levels of administration.

We did not find evidence, however, that public contracts show more amendments in politically contestable markets (see Table 20). Unfortunately, we were not able to link amendments to contacts; therefore, we had to rely on the average number of amendments and average values of political contestability, thereby losing the within-state time variability.

Our estimations looked at the effects of political contestability on public contracts only. As a robustness check, we reran our regressions for private contracts only (see Table 21). We found that private contracts are significantly lengthier for only one variable in one specification: winning margin with state fixed effects. However, the magnitude was economically insignificant (less than 0.5% lengthier contracts when the winning margin increases by one standard deviation) and the coefficient was positive (i.e., contrary to the expected). Therefore, we reject the alternative hypothesis that a common factor affects state political contestability and contract design (e.g., economic downturn).

9 Scope and Limitations of the Research

The presented results are robust to a series of tests controlling for corporate financials, state, and length and type of document. They are also robust to alternative explanations: Flexibility clauses and the subsample of private contracts do not show the same patterns as observed in rigidity clauses and public contracts.

Our estimates may be driven by sector/industry specificity; for example, public utilities contracts have more of certain rigidity clauses than private contracts. Furthermore, utilities have been around longer and may have learned to contract differently to survive. It is precisely this evolution into contract rigidities what we are trying to capture and endogenize. Public contracts are subject to third-party challenges; consequently, public agents have learned to minimize political hazards with contract rigidities.

Our results are, however, limited by the nature and sourcing of our data. Spiller (2008) and Moszoro and Spiller (2012) developed a theory of higher rigidity of public contracts related to similar goods/services procured by public versus private agents, whereas contracts filed in the 10-K of public utilities and private companies are not necessarily for similar goods/services. We believe that the large sample of contracts in our collection reduces this object bias.

Contract complexity is correlated with the duration, geographical scope, and value of the contracts. Due to data treatment constraints, we were not able to excerpt and control for these variables, but somehow ameliorated these limitations through state and financial controls.

The results are also stained by two other implicit biases: subject and sample biases. As for the subject bias, we identified contracts of public utilities as public contracts. Truly public contracts would include procurement contracts from public agencies, government-sponsored enterprises, and governments—municipalities, counties, states, and the federal government. These institutions, however, do not file 10-Q and 10-K and their records are not standardized and directly comparable.

As for the sample bias, it seems the SEC's EDGAR—although large—is not (yet) a comprehensive contract set. The small but still quantifiable ratio of unidentified companies by CIK raises concerns about sample bias as well. We cannot rule out multiple occurrences of the same contract.[16] We assume, however, that the filings and our sample are heterogeneous and representative of the whole contract population.

Contracting markets and political markets overlap only partially. Perfect overlapping implies local administrative or natural monopolies. Our measures of political contestability are determined by political districts, whereas contracting markets are given by the area covered by the companies.

[16] For example, if Exxon sold cold to DTE Energy, the contract could show twice.

Finally, conclusions from our algorithmic data reading and word clustering methodology may differ by jurisdictions—between statutory and common law worlds, and within the common law system—thereby limiting its potential applicability. We partially addressed this issue by using state fixed effects to account for state law differences.

10 Concluding Remarks

The results of our textual analysis show that public contracts are lengthier and feature more arbitration, evaluation, litigation, and penalty clauses; in addition, their renegotiation is formalized in amendments with more arbitration, evaluation, litigation, and termination clauses. We further found that these patterns are reinforced in political contestability in the subsample of public contracts.

Apart from the empirical results themselves, our paper contributes to the literature in a threefold manner:

(a) We provide a replicable methodology for the analysis of contracts. Textual analysis is a young, but promising avenue of research. It enables the creation of novel datasets from document libraries (i.e., plain text) to test a variety of contractual theories and bridge law and economics research and practice.

(b) We construct dictionaries that are descriptive of the multidimentional characteristics of public versus public contracts. These dictionaries can serve as a reference that can be further developed and extended to other contractual characteristics.

(c) We advance a plausible rationale with testable hypotheses of the difference between public and purely private contracts. Following Moszoro and Spiller (2012), we sustain that the higher rigidity of public contracts is a political risk adaptation of public agents by which they lower the likelihood of success of third-party (opportunistic) challengers. Our results are consistent with this view.

Prospective research includes extending the analysis to other types of contracts (e.g., employment/compensation). On the methodology side, spacial analysis can be applied to identify the separating hyperplane of public and private contracts.

On a policy note, it would be worthy for the SEC to require in Exhibit 10 of the 10-Q and 10-K filings the description of type of contract filed (e.g., according to the ones described in

items 601(b)(10) of Regulation S-K and Regulation S-B) and the identification of the non-filing counter party by CIK.

Appendix A Rigidity in Public Contracting at a Municipal Utility[17]

Public agencies in the State of California follow the California Public Contract Code (PCC) for procurement of materials and supplies, professional and general services, and construction contracts. The exact provisions of the contract vary by type and by agency. Almost universally, materials and supplies are awarded on a low bid basis, and professional and general services on a qualifications basis. The PCC has very limited applicability for design-build contracting (contracts for construction that are awarded to a designer and contractor on a the basis of a qualifications based construction process). Contracts must exceed a certain dollar threshold, be of a certain type (buildings, certain public works), and follow guidelines for a selection process and then final reporting to state agencies.

The letter and intention of the PCC are to provide for equity and fairness in contracting and eliminate favoritism and collusion. To that end, public contracting procedures and contract documents contain provisions to comply with these requirements and guiding principals.

Public utilities have contract templates that have been developed over a period of several decades. Those utilities with active in-house design and contracting groups maintain their contract templates so that they comply with current legal requirements.

A list of standard contractual features, which ensure fairness and minimize collusion and protests, is presented below:

1. Public works construction contracts over a certain dollar threshold (in the case of the EBMUD, $70,000) must be publicly advertised and bid. Bids are publicly opened in an agency's board boom or similar public room, after being stamped and dated in the agency's purchasing division. Bids' documents are available for review by any interested party immediately after bid opening, and afterwards upon request. Bid results are summarized and posted online within one business day.
2. Employees with a financial interest in a company cannot be involved in a selection process that involves or potentially involves that company. Elected board officials cannot vote on contracts where they have a financial involvement. All supervisors and managers whose job involves public procurement decisions must file a Statement of Economic Interests annually with the Secretary of the District—this is a public record, available for public review.
3. Bids are objective and compared based on a total bid cost. Bid exceptions are not allowed. To make this possible, prescriptive specifications are developed to give clear, objective criteria on which bidders can base their bid. On occasion, performance based specifications are used, but enough specificity is provided to allow bidders to prepare a fixed price bid. Sole-source contracts are used on a very limited basis and are only allowed in limited circumstances under the PCC. Internal procedures exist to evaluate and approve the appropriateness of any sole-source specification. Regarding the bids themselves, official bid forms must be used, which include:
   (a) A bid form with line items including either lump sum or unit cost bid; line items such as "allowances" are rarely used, and if used, it is in minor amounts with clear guidelines on how funds are to be authorized—in writing, after receiving and reviewing an estimate, only for specific tasks, etc.
   (b) A description of bid items, describing the basis for the evaluation of bids;
   (c) A signed and notarized bidder's bond;
   (d) A signed and notarized proposal form, signed by an authorized agent of the company;
   (e) A declaration on non-collusion;
   (f) A declaration of eligibility to work on public works project;
   (g) Designation of subcontracts; and
   (h) Contract Equity program documents—usually specific to an agency, containing documentation of compliance with any local, small, or minority- and/or women-owned business requirements.

[17] We are grateful to Elisabeth Bialek for her firsthand insights into the practice of public contracting at East Bay Municipal Utility District, Oakland, California.

4. Bids are evaluated and reference documents checked, and ultimately formally awarded by the agency's regulating board:
   (a) Bids can only be withdrawn in limited circumstances, as defined in the PCC (clerical error). This ensures fairness and stops the case of bidders testing the waters with a low bid and withdrawing if they find that they are significantly lower than other bidders.
   (b) Bids with irregularities cannot be accepted (errors in bid documents that would allow a bidder to withdraw cannot be accepted, even if the bidder does not withdraw).
   (c) Insurance, performance bonds, and eligibility to work on public works projects are checked.
5. Contracts are administered by construction management professionals. To track progress, make appropriate payments, and ensure completion of the project and that it meets appropriate standards, the following contract features are included:
   (a) Payment and performance bonds for the full contract value
   (b) Liability, workers compensation, and builders risk insurance (the latter only if applicable)
   (c) Payment procedures, including requirements for schedule submittals, and documentation of charges, including payment of prevailing wages (required for all public works contracts)
   (d) Submittal procedures (for verifying if materials and equipment conform to specifications—prior to ordering and installation)
   (e) Construction inspection and independent materials testing
   (f) Change order procedures (usually issued on a lump sum basis, based on a contractor quote, reviewed and approved by an engineer, and signed off by a senior or manager, as appropriate for the amount of the change order; time and materials/force account change orders are used in limited circumstances)
   (g) Claims and dispute resolution procedures
   (h) Liquidated damages procedures for unapproved delays in contract completion (raging from $1,000 to several thousands per day, depending on actual damages)
   (i) Contracts are audited periodically
6. On higher-risk projects (higher risk due to cost, liability, and criticality of infrastructure), the following procedures are sometimes included:
   (a) Expanded evaluation of bidder's and qualifications—in essence, a pre-qualification procedure. Contractors are selected on a low-bid basis, but must meet more stringent qualifications requirements
   (b) Higher insurance thresholds
   (c) Escrow bid documents: contractors submit their actual bid documents to the awarding agency after award; these are sealed by the contractor, stored in escrow, and only opened by both parties in the presence of a third party in case of a dispute. This aids in the equitable resolution of disputes
   (d) Higher liquidated damages (must be based on realistic estimates of damages)
   (e) Alternate dispute resolution procedures, involving appointed resolution boards, binding or non-binding arbitration, mediation, etc.
   (f) Specific processing provisions for third-party claims
   (g) Detailed pre-construction surveys on a property-by-property basis

Regarding cost specifics:

1. Typical planning, design, and construction management costs amount to 10–15 percent of the total construction cost. These numbers vary based on job complexity and scale. Overall, smaller, more complex jobs have higher design and administration costs on a percentage basis.
2. Actual change order percentages for contracts tend to be around 5 percent (EBMUD budgets for 5–10 percent).

3. Protests on bids typically cost an agency $5,000–15,000, not including the differential cost to go to the next lowest bid. If a protest raises questions that are legitimate enough to question the low bid, but not definitive enough to reject the low bid without the risk of a counter-protest or further litigation, the option of re-bid (re-advertise and solicit for new bids) is usually chosen. If a re-bid is required, costs are $20,000–30,000, which does not include any possible increases in contract cost, even without scope changes.

4. Bid amount or ultimate contract cost as compared to engineer's estimate (EE) varies. The PCC requires that agencies demonstrate that adequate funding is available for a public works project before it is advertised. To comply with this, an in-house EE is prepared prior to advertising a project for award. When bids are received, if there is more than a 10 percent deviation between the low bid and the EE, the specifics are investigated. It is not uncommon to have a wider deviation. After an evaluation, if bids are deemed reasonable, adequate funding exists, and the work is deemed necessary, projects are awarded, even if they exceed the engineer's estimate. Typical reasons for cost deviation are as follows:

   (a) When multiple bids (more than 3 to 5) are received, costs tend to be lower.

   (b) In crisis times—like the current economy—favorable bids are received for most projects, since private sector work has significantly slowed over the past 2–3 years. In calendar years 2009–2010, bids on average, were 18 percent below the EE. In calendar year 2011, bids, on average were 3 percent under the EE. Part of this may reflect an improvement in the economy and more work available for bidders (meaning less need to bid low on public works projects). Part may be due to the agency's adjustment of EE to reflect current market costs.

   (c) It seems to be consistently difficult to estimate costs on projects with extensive electrical work, instrumentation/controls or other technology projects, or work that the agency does not typically bid out.

   (d) Certain commodities' costs fluctuate widely (e.g., concrete, metals), and so bids may be higher when costs are up or expected to widely fluctuate for the duration of the project. Contractors bid high to minimize their risk.

   (e) Certain commodities have widely varying costs based on the quantity purchased (e.g., paving, fencing, concrete).

   (f) Certain services, such as rock, concrete, asphalt, and soil disposal, vary widely in cost and based on local market. These services range in cost from free to being a revenue source or being a liability with a high cost per ton for disposal.

   (g) On occasion, elements may be underestimated or overestimated by the agency due to an error with data or assumptions.

5. It is difficult to quantify costs for minimizing political risks. Agency projects are developed under the California Environmental Quality Act, which requires public input into projects and the mitigation of adverse effects. There is a political influence to shaping projects. Mitigation measures always add costs to a project (tree re-plantings, habitat restoration, longer pipeline routings to minimize traffic impacts, sound barriers, limited work hours, noise mitigations, etc.). These costs are scrutinized during project development, and a balance is made between the need to minimize impacts and responsibly spend public funds. Agencies may have internal guidelines for what constitutes appropriate and not excessive mitigation measures.

References

Allen, D. and D. Lueck (1992). Contract choice in modern agriculture: Cash rent versus cropshare. *Journal of Law and Economics 35*(2), 397–426.

Allen, D. and D. Lueck (1993). Transaction costs and the design of cropshare contracts. *RAND Journal of Economics 24*(1), 78–100.

Battigalli, P. and G. Maggi (2002). Rigidity, discretion, and the costs of writing contracts. *American Economic Review 92*(4), 798–817.

CQ Voting and Elections Collection (2014). CQ Press, Washington, D.C. http://library.cqpress.com/elections/.

Crocker, K. J. and S. E. Masten (1988). Mitigating contractual hazards: Unilateral options and contract length. *RAND Journal of Economics 19*(3), 327–343.

Crocker, K. J. and S. E. Masten (1991). Pretia ex machina? Prices and process in long-term contracts. *Journal of Law and Economics 34*(1), 69–99.

Crocker, K. J. and K. J. Reynolds (1993). The efficiency of incomplete contracts: An empirical analysis of Air Force engine procurement. *RAND Journal of Economics 24*(1), 126–146.

Drahozal, C. R. and K. N. Hylton (2003). The economics of litigation and arbitration. *Journal of Legal Studies 32*(2), 549–584.

Drahozal, C. R. and S. J. Ware (2010). Why do businesses use (or not use) arbitration clauses? *Ohio State Journal on Dispute Resolution 25*(2), 433–476.

Dye, R. A. (1985). Costly contract contingencies. *International Economic Journal 26*(1), 233–250.

Getz, K. A. (1997). Research in corporate political action: Integration and assessment. *Business & Society 36*(1), 32–72.

Goldberg, V. P. (1976). Toward an expanded economic theory of contract. *Journal of Economic Issues 10*(1), 45–61.

Hart, O. and J. Moore (1988). Incomplete contracts and renegotiation. *Econometrica 56*(4), 755–785.

Joskow, P. L. (1985). Vertical integration and long-term contracts: The case of coal-burning electric generating plants. *Journal of Law, Economics, and Organization 1*(1), 33–80.

Joskow, P. L. (1987). Contract duration and relationship-specific investments: Empirical evidence from coal markets. *American Economic Review 77*(1), 168–185.

Lafontaine, F. (1992). Agency theory and franchising: Some empirical results. *RAND Journal of Economics 23*(2), 263–283.

Lafontaine, F. (1993). Contractual arrangements as signaling devices: Evidence from franchising. *Journal of Law, Economics, and Organization 9*(2), 256–289.

Lambert-Mogiliansky, A. and G. Kosenok (2009). Fine-tailored for the cartel-favoritism in procurement. *Review of Industrial Organization 35*(1–2), 95–121.

Leffler, K. B. and R. R. Rucker (1991). Transactions costs and the efficient organization of production: A study of timber-harvesting contracts. *Journal of Political Economy 99*(5), 1060–1087.

Loughran, T. and B. McDonald (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance 66*(1), 35–65.

Masten, S. E. and K. J. Crocker (1985). Efficient adaptation in long-term contracts: Take-or-pay provisions for natural gas. *American Economic Review 75*(5), 1083–1093.

Masten, S. E. and E. A. Snyder (1993). United States versus United Shoe Machinery Corporation: On the merits. *Journal of Law and Economics 36*(1), 33–70.

Matsumoto, D. A. (2002). Management's incentives to avoid negative earnings surprises. *The Accounting Review 77*(3), 483–514.

Mitnick, B. M. (1993). Political contestability. In B. M. Mitnick (Ed.), *Corporate Political Agency: The Construction of Competition in Public Affairs*, pp. 11–66. Newbury Park, CA: Sage.

Moszoro, M. and P. T. Spiller (2012). Third-party opportunism and the nature of public contracts. Working Paper 18636, National Bureau of Economic Research.

Mundo, P. A. (1992). *Interest Groups: Cases and Characteristics*. Chicago: Nelson-Hall.

Overdahl, J. A. (1991). A researcher's guide to the contracts of firms filing with the sec. *Journal of Law and Economics 34*(October), 695–701.

Parkhe, A. (1993). Strategic alliance structuring: A game theoretic and transaction cost examination of interfirm cooperation. *The Academy of Management Journal 36*(4), 794–829.

Schwartz, A. and R. E. Scott (2003). Contract theory and the limits of contract law. *Yale Law Journal 113*, 541–619.

Schwartz, A. and R. E. Scott (2010). Contract interpretation redux. *Yale Law Journal 119*, 926–964.

Schwartz, A. and J. Watson (2004). The law and economics of costly contracting. *Journal of Law, Economics, and Organization 20*(1), 2—31.

Schwartz, A. and J. Watson (2012). Conceptualizing contractual interpretation. Research Paper 447, Yale Law & Economics.

Shavell, S. (2006). On the writing and the interpretation of contracts. *Journal of Law, Economics, and Organization 22*(2), 289–314.

Spiller, P. T. (2008). An institutional theory of public contracts: Regulatory implications. NBER Working Paper 14152, National Bureau of Economic Research.

Table 1: This table presents the keywords searched and grouped into contract rigidity categories. Plurals (e.g., penalties) and variations (e.g., penalized) are also counted.

Arbitration	**Certification**	**Evaluation**	**Litigation**
arbitration, conciliation, settlement, whereas[18]	certification, regulation	obligation, quality, scrutiny	dispute, indictment, jury, litigation
Penalties	**Termination**	**Design**	
fine, penalty, sanction	dissolution, termination	anticipation, planning, scenario	

Table 2: This table presents the keywords used for file subject identification and descriptive category grouping.

Types of contract	**Keywords in file's first 100 lines**
Amendment	amend, amended, amendment, and release, and restated, change in, change of, modification agreement
Commercial contracts	license, purchase, sale, supply
Compensation/Employment	award agreement, bonus plan, compensation, director stock, employee stock, employment, equity incentive, executive employment, executive officer, executive retirement, incentive, indemnification agreement, management agreement, management incentive, non-employee director, of director, of executive, option agreement, option grant, option plan, restricted stock, retention agreement, retirement plan, savings plan, separation agreement, service agreement, services agreement, settlement agreement, severance agreement, stock agreement, stock award, stock incentive, stock option, stock plan, stock purchase, supplemental executive, term incentive
Consulting	consulting
Finance	credit, lease, loan, pledge, promissory note, revolving

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

Table 3: This table presents statistics for the dataset at each stage.

Step	Treatment	Count
1	Readable filings	206,677
	Filing companies	14,043
	Average filings per company	15
	Average filing length (geometric average of "the", "and", and "of")	285
2	Sample industry diversity: identified different 4-code SIC	443
	Dropped non-readable filings	3,674
	Dropped files with no CIK or SIC codes identified	26,282
	Dropped files SIC 6*** (Finance) and SIC 9*** (Administration)	32,982
	Public utilities contracts (SIC 4900–4999)	11,657
	Quasi-regulated industries contracts (SIC 4000–4499 & 4800–4899)	8,543
	Total public contracts	**20,200**
	Total private contracts	**123,543**
4	Keyword count overall	5,644,668
	Arbitration	396,178
	Certification	872,843
	Evaluation	1,304,934
	Litigation	289,750
	Penalties	773,392
	Termination	1,940,419
	Design	67,152
5	Filings with identified categories (categories may overlap)	126,913
	Amendment	96,552
	Commercial contracts	54,344
	Compensation/Employment	88,238
	Consulting	4,559
	Finance	50,492

Table 4: This table presents the breakdown of commercial contracts by main contracts and amendments and by public or private filer, where a public filer is a public utility or a quasi-regulated company.

	Public	Private	Total
Main contracts	230	2,129	2,359
Amendments	659	4,172	4,831
Total	889	6,301	7,190

Table 5: This table presents the summary statistics of the words counted in commercial contracts and amendments to commercial contracts by contractual clauses.

Variable	Obs	Mean	Std. Dev.	Min	Max
Arbitration	7190	3.5	8.1	0	189
Certification	7190	7.9	14.4	0	228
Evaluation	7190	11.5	22.0	0	496
Litigation	7190	2.7	5.9	0	140
Penalties	7190	5.6	12.7	0	522
Termination	7190	12.0	18.3	0	439
Design	7190	0.5	1.4	0	38

Table 6: This table presents summary statistics of contract length broken down by types of commercial contract Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Public contracts are public utility and quasi-regulated industry filings, and private contracts are the remaining filings.

Type of commercial contract	Obs	Mean	Std. Dev.	Min	Max
License contracts					
Utilities	12	4.7	1.6	1.6	7
Quasi-regulated	26	5.1	1.2	2.3	7.7
Private	611	5.1	1.4	.7	8.3
Sale/procurement contracts					
Utilities	96	5.3	1.5	1.8	7.6
Quasi-regulated	96	5	1.4	1.8	7.9
Private	1518	4.9	1.4	.7	8.6
All contracts					
Utilities	108	5.3	1.6	1.6	7.6
Quasi-regulated	122	5	1.4	1.8	7.9
Private	2129	5	1.4	.7	8.6

Table 7: This table presents the public versus private length mean-comparison t-test. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Utilities and quasi-regulated are contracts filed by a public utility or a quasi-regulated industry, respectively; private contracts are the remaining filings.

Filing company	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
Public	230	5.146447	.0968425	1.468689	4.955631	5.337263
Private	2129	4.969246	.0302541	1.395955	4.909915	5.028576
Combined	2359	4.986523	.0289044	1.403875	4.929842	5.043203
Difference		.1772009	.097393		-.013784	.3681858

Difference = mean(Public) – mean(Private) $t = 1.8194$
Ho: diff = 0 Degrees of freedom = 2357
Ha: diff < 0 Ha: diff $\neq 0$ Ha: diff > 0
$\Pr(T < t) = 0.9655$ $\Pr(|T| > |t|) = 0.0690$ $\Pr(T > t) = 0.0345$

Table 8: This table presents results from cross-section OLS regressions of main contract length on contract attributes: public utilities and quasi-regulated versus private industries. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Assets total, capital expenditure, and sales equal the natural logarithm of these values in US$. Controls include: assets total, capital expenditure, sales, industry (one-digit SIC) fixed effects, and excluding short filings (without bottom 10% in length). Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Length of Public Contracts

	(1) Length	(2) Length	(3) Length	(4) Length	(5) Length	(6) Length	(7) Length	(8) Length
Utilities	0.286**	1.327***	0.247**	0.589*	0.187	1.274***	0.141	0.538*
	(2.07)	(3.99)	(2.15)	(1.85)	(1.26)	(3.80)	(1.14)	(1.69)
Quasi-regulated	0.0806	1.121***	0.0181	0.359	-0.0216	1.076***	-0.0538	0.348
	(0.62)	(3.40)	(0.17)	(1.14)	(-0.15)	(3.22)	(-0.45)	(1.09)
Assets Total					0.117***	0.103***	0.0819***	0.0653**
					(3.32)	(2.86)	(2.80)	(2.18)
Capital Expenditure					0.000221	0.0167	0.0233	0.0375*
					(0.01)	(0.66)	(1.14)	(1.78)
Sales					-0.0842***	-0.0837***	-0.0668***	-0.0640***
					(-3.61)	(-3.37)	(-3.44)	(-3.10)
Constant	4.969***	4.792***	5.286***	5.171***	4.777***	4.612***	5.153***	5.053***
	(163.41)	(45.43)	(206.21)	(57.07)	(42.91)	(30.94)	(55.51)	(40.08)
One-digit SIC	No	Yes	No	Yes	No	Yes	No	Yes
Short contracts off	No	No	Yes	Yes	No	No	Yes	Yes
Observations	2359	2359	2109	2109	2065	2065	1848	1848
Adjusted R^2	0.001	0.012	0.001	0.008	0.009	0.022	0.013	0.021

Table 9: This table presents results from OLS cross-section regressions of frequency of rigidity clauses on contract attributes: public versus private and contract length. The frequency of each rigidity clause is computed as the natural logarithm of the ratio of the count of rigidity words divided by the geometric average of the sum of "the", "and", and "of". Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Rigidity Clauses in Public Contracts

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Utilities	0.318**	0.105	0.250***	0.380***	0.347***	-0.0630	0.138
	(2.33)	(1.24)	(2.89)	(3.36)	(4.27)	(-0.62)	(1.40)
Quasi-regulated	-0.138	-0.0256	0.0195	-0.0728	0.117	-0.0136	0.173
	(-1.08)	(-0.30)	(0.24)	(-0.71)	(1.56)	(-0.15)	(1.52)
Length	-0.543***	-0.150***	-0.0764***	-0.476***	-0.336***	-0.270***	-0.759***
	(-17.95)	(-8.53)	(-4.49)	(-20.07)	(-22.26)	(-14.89)	(-30.40)
Constant	-1.207***	-2.998***	-3.105***	-1.797***	-2.236***	-1.812***	-0.986***
	(-6.75)	(-29.98)	(-32.60)	(-12.87)	(-26.62)	(-17.98)	(-6.40)
Observations	1095	1666	1797	1140	1769	1811	537
Adjusted R^2	0.226	0.041	0.013	0.261	0.222	0.109	0.633

Table 10: This table presents results from OLS cross-section regressions of frequency of rigidity clauses on contract attributes: public versus private and contract length. The frequency of each rigidity clause is computed as the natural logarithm of the ratio of the count of rigidity words divided by the geometric average of the sum of "the", "and", and "of". Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Controls include: type of contract, state, and year fixed effects. Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; $^{+}$ denotes significance at 15%, * significance at 10%, ** significance at 5%, and *** significance at 1%.

Rigidity Clauses in Public Contracts

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Utilities	0.240^{+}	-0.0233	0.212**	0.391***	0.349***	0.0109	0.191^{+}
	(1.54)	(-0.25)	(2.28)	(3.07)	(3.89)	(0.10)	(1.50)
Quasi-regulated	-0.177	-0.0369	0.0392	-0.0763	0.114^{+}	0.0971	0.302**
	(-1.30)	(-0.41)	(0.46)	(-0.71)	(1.45)	(1.02)	(2.30)
Length	-0.544***	-0.141***	-0.0686***	-0.473***	-0.328***	-0.264***	-0.764***
	(-16.64)	(-7.63)	(-3.91)	(-19.10)	(-21.27)	(-14.29)	(-28.39)
Constant	-2.305**	-4.536***	-1.415*	-2.582***	-1.916**	-1.439^{+}	-0.426
	(-1.97)	(-5.47)	(-1.67)	(-2.90)	(-2.37)	(-1.50)	(-0.55)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1095	1666	1797	1140	1769	1811	537
Adjusted R^2	0.244	0.051	0.032	0.309	0.237	0.139	0.630

Table 11: This table presents results from OLS cross-section regressions of frequency of rigidity clauses on contract attributes: public versus private and contract length. The frequency of each rigidity clause is computed as the natural logarithm of the ratio of the count of rigidity words divided by the geometric average of the sum of "the", "and", and "of". Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Controls include state and year fixed effects. We excluded short filings (bottom 10% in length). Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Rigidity Clauses in Public Contracts

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Utilities	0.189	-0.0333	0.177*	0.337***	0.347***	-0.0287	0.142
	(1.21)	(-0.36)	(1.93)	(2.63)	(3.90)	(-0.26)	(1.11)
Quasi-regulated	-0.194	-0.00410	0.0529	-0.0728	0.122	0.0977	0.313**
	(-1.39)	(-0.05)	(0.63)	(-0.67)	(1.54)	(0.98)	(2.40)
Length	-0.524***	-0.0907***	-0.0187	-0.451***	-0.273***	-0.237***	-0.745***
	(-15.29)	(-4.78)	(-1.03)	(-17.33)	(-16.30)	(-11.32)	(-26.94)
Constant	-2.628**	-4.706***	-1.922**	-2.972***	-2.202***	-1.777*	-0.604
	(-2.23)	(-5.80)	(-2.30)	(-3.31)	(-2.76)	(-1.82)	(-0.78)
Short contracts off	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1083	1643	1771	1128	1725	1755	534
Adjusted R^2	0.195	0.021	-0.004	0.251	0.159	0.096	0.611

Table 12: This table presents results from OLS cross-section regressions of frequency of flexibility clauses on contract attributes: public versus private and contract length. The frequency of each flexibility clause is computed as the natural logarithm of the ratio of the count of rigidity words divided by the geometric average of the sum of "the", "and", and "of". Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Controls include state and year fixed effects. We excluded short filings (bottom 10% in length). Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Flexibility Clauses in Public Contracts

	(1) Flexibility	(2) Flexibility	(3) Flexibility	(4) Flexibility	(5) Flexibility	(6) Flexibility	(7) Flexibility	(8) Flexibility
Utilities	0.0468	0.0627	0.0770	0.0575	0.0240	0.0409	0.0556	0.0320
	(0.64)	(0.85)	(0.99)	(0.74)	(0.34)	(0.57)	(0.73)	(0.42)
Quasi-regulated	-0.0778	-0.0721	-0.105	-0.102	-0.0671	-0.0612	-0.0913	-0.0897
	(-1.12)	(-1.04)	(-1.47)	(-1.43)	(-1.00)	(-0.91)	(-1.30)	(-1.28)
Length	0.111***	0.110***	0.114***	0.114***	0.174***	0.173***	0.168***	0.170***
	(7.81)	(7.78)	(7.94)	(7.94)	(11.68)	(11.68)	(11.16)	(11.24)
Constant	-3.576***	-3.514***	-3.592***	-2.986***	-3.941***	-3.876***	-3.861***	-3.298***
	(-45.43)	(-42.64)	(-5.45)	(-4.07)	(-47.39)	(-44.88)	(-6.01)	(-4.62)
Type of contract	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State fixed effects	No	No	Yes	Yes	No	No	Yes	Yes
Year fixed effects	No	No	No	Yes	No	No	No	Yes
Short contracts off	No	No	No	No	Yes	Yes	Yes	Yes
Observations	1901	1901	1901	1901	1865	1865	1865	1865
Adjusted R^2	0.031	0.034	0.067	0.074	0.068	0.071	0.093	0.101

Table 13: This table presents results logit cross-section regressions of the likelihood of an amendment for public utilities, quasi-regulated industries, and private companies. The dependent variable equals one when a document is an amendment. The dependent variable is a dummy variable equal to one when the filing is an amendment to a commercial contract. Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Controls include: length and type of contract and state fixed effects. Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Likelihood of Amendments of Public Contracts compared with Private Contracts

	(1) Amendments	(2) Amendments	(3) Amendments	(4) Amendments	(5) Amendments	(6) Amendments
main						
Utilities	0.0994***	0.0930***	0.0874***	0.488***	0.459***	0.439***
	(4.35)	(4.05)	(3.58)	(4.29)	(4.02)	(3.58)
Quasi-regulated	0.0605***	0.0596**	0.0525**	0.284***	0.281**	0.251**
	(2.61)	(2.58)	(2.20)	(2.59)	(2.55)	(2.17)
Length	-0.00897**	-0.00855**	-0.0111***	-0.0410**	-0.0391**	-0.0519***
	(-2.26)	(-2.16)	(-2.79)	(-2.26)	(-2.15)	(-2.80)
Constant	0.706***	0.679***	0.826***	0.875***	0.752***	1.516
	(34.64)	(29.78)	(3.95)	(9.36)	(7.24)	(1.35)
Type of contract	No	Yes	Yes	No	Yes	Yes
State fixed effects	No	No	Yes	No	No	Yes
Observations	7190	7190	7190	7190	7190	7183
Adjusted R^2	0.004	0.004	0.020			
Pseudo R^2				0.003	0.004	0.022

Table 14: This table presents results from OLS regressions of the average number of amendments in public utilities, quasi-regulated industries, and private companies. The dependent variable is the ratio of total number of amendments to total number of filings per company. Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Sales the natural logarithm of sales in US$. Controls include: sales and type of contract (license or sale/procurement) and state fixed effects. Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Average Number of Amendments to Public Contracts Compared with Private Contracts

	(1) Avg. Amends	(2) Avg. Amends	(3) Avg. Amends	(4) Avg. Amends	(5) Avg. Amends	(6) Avg. Amends	(7) Avg. Amends	(8) Avg. Amends
Utilities	0.0875***	0.0895***	0.0576*	0.0620*	0.0809**	0.0846**	0.0548	0.0599*
	(2.63)	(2.64)	(1.70)	(1.79)	(2.43)	(2.49)	(1.62)	(1.73)
Quasi-regulated	0.0360	0.0358	0.0147	0.0156	0.0349	0.0355	0.0146	0.0158
	(1.20)	(1.16)	(0.48)	(0.49)	(1.17)	(1.16)	(0.47)	(0.50)
Sales			0.0142***	0.0133***			0.0134***	0.0127***
			(5.39)	(4.85)			(5.04)	(4.60)
Constant	0.656***	0.833***	0.600***	0.811***	0.618***	0.784***	0.577***	0.778***
	(87.77)	(3.33)	(41.33)	(3.28)	(46.46)	(3.13)	(32.79)	(3.14)
Type of contract	No	No	No	No	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3799	3799	3412	3412	3799	3799	3412	3412
Adjusted R^2	0.002	0.008	0.010	0.013	0.004	0.010	0.011	0.014

Table 15: This table presents results from OLS cross-section regressions of frequency of rigidity clauses in public contract amendments compared with private contract amendments. Utilities and quasi-regulated are dummy variables equal to one when the filing company is a public utility or a quasi-regulated industry, respectively. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". Controls include: length and and type of contract (license or sale/procurement), state, and year fixed effects. Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Rigidity Clauses in Public Contract Amendments Compared with Private Contracts

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Utilities	0.211*	0.0656	0.166***	0.0827	0.128***	0.110*	-0.0593
	(1.86)	(1.13)	(2.96)	(1.01)	(2.65)	(1.71)	(-0.81)
Quasi-regulated	-0.110	-0.154***	0.0266	-0.125*	0.0963**	-0.0256	0.0598
	(-1.13)	(-2.75)	(0.50)	(-1.73)	(2.04)	(-0.42)	(0.74)
Length	-0.599***	-0.0611***	-0.0618***	-0.410***	-0.350***	-0.233***	-0.805***
	(-24.61)	(-4.54)	(-5.26)	(-21.72)	(-36.94)	(-17.81)	(-47.79)
Constant	-1.890***	-3.048***	-2.452***	-0.642	-1.752***	-1.755***	-0.350
	(-2.98)	(-5.63)	(-4.56)	(-0.87)	(-3.88)	(-2.59)	(-0.42)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1994	3137	3556	2119	3800	3527	1075
Adjusted R^2	0.257	0.018	0.042	0.200	0.285	0.105	0.701

Table 16: This table presents results from OLS cross-section regressions of public contract length on political contestability variables. Winning margin is the difference between the winner's and the runner-up's share vote in percentage points; small winning margin is a variable equal to one when the winning margin is narrow (below 10%); and political opposition strength is measured as the Herfindahl-Hirschman Index (HHI) of residual (non-winning) parties' vote share in general elections weighted by the overall non-winning vote share in general elections. Controls include: governor's tenure in office, type of contract (license or sale/procurement), and state fixed effects. Data are from the SEC's EDGAR database and the CQ Voting and Elections Collection. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Political Contestability Effects on Public Contract Length

	(1) Length	(2) Length	(3) Length	(4) Length	(5) Length	(6) Length
Winning margin	-0.00263	-0.0111**				
	(-0.63)	(-2.00)				
Small winning margin			0.140	0.259**		
			(1.40)	(2.20)		
Political opposition strength					-0.134	1.719*
					(-0.22)	(1.76)
1st year in office	-0.0225	-0.0110	-0.0211	-0.00179	-0.0197	-0.0173
	(-0.16)	(-0.08)	(-0.15)	(-0.01)	(-0.14)	(-0.12)
2nd year in office	-0.0232	0.0346	-0.0216	0.0353	-0.0239	0.0131
	(-0.17)	(0.24)	(-0.16)	(0.25)	(-0.18)	(0.09)
3rd year in office	0.282**	0.326**	0.282**	0.341**	0.287**	0.315**
	(2.13)	(2.39)	(2.14)	(2.50)	(2.17)	(2.31)
Constant	4.989***	4.864***	4.894***	4.552***	4.994***	4.157***
	(30.73)	(7.82)	(32.32)	(7.25)	(19.22)	(5.85)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes	No	Yes
Observations	842	842	842	842	842	842
Adjusted R^2	0.004	0.073	0.005	0.074	0.003	0.072

Table 17: This table presents results from OLS cross-section regressions of frequency of rigidity clauses in public contracts on winning margins. Winning margin is the difference between the winner's and the runner-up's share vote in percentage points. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". We control for type of contract (license or sale/procurement). Data are from the SEC's EDGAR database and the CQ Voting and Elections Collection. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Winning Margin Effect on Public Contract Rigidity Clauses

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Winning margin	-0.00938*	0.00224	-0.00121	-0.0101***	0.00199	0.00196	0.00184
	(-1.90)	(0.86)	(-0.43)	(-2.94)	(0.87)	(0.64)	(0.55)
Length	-0.458***	-0.0814***	-0.0456	-0.311***	-0.276***	-0.251***	-0.781***
	(-8.34)	(-3.02)	(-1.59)	(-7.26)	(-12.92)	(-8.65)	(-21.23)
Constant	-1.491***	-3.646***	-3.043***	-2.597***	-2.442***	-1.841***	-0.791***
	(-4.24)	(-20.78)	(-16.68)	(-9.56)	(-17.73)	(-9.90)	(-3.01)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	342	576	626	380	678	629	243
Adjusted R^2	0.178	0.034	0.012	0.135	0.197	0.112	0.666

Table 18: This table presents results from OLS cross-section regressions of frequency of rigidity clauses in public contracts on winning margin dummies. Winning margin is the difference between the winner's and the runner-up's share vote in percentage points. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". We control for type of contract. Data are from the SEC's EDGAR database and the CQ Voting and Elections Collection. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Winning Margin Dummies Effect on Public Contract Rigidity Clauses

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Small winning margin	0.316***	-0.0691	0.0921	0.234***	0.0512	0.0757	-0.0946
	(2.83)	(-1.11)	(1.36)	(2.77)	(0.94)	(1.01)	(-1.16)
Length	-0.463***	-0.0824***	-0.0473*	-0.307***	-0.278***	-0.255***	-0.779***
	(-8.50)	(-3.06)	(-1.66)	(-7.17)	(-13.02)	(-8.79)	(-21.47)
Constant	-1.734***	-3.579***	-3.090***	-2.867***	-2.420***	-1.820***	-0.738***
	(-5.27)	(-21.13)	(-17.86)	(-10.85)	(-18.34)	(-10.32)	(-3.08)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	342	576	626	380	678	629	243
Adjusted R^2	0.189	0.035	0.015	0.133	0.197	0.113	0.667

Table 19: This table presents results from OLS cross-section regressions of frequency of rigidity clauses in public contracts on winning margin dummies by political party. Winning margin is the difference between the winner's and the runner-up's share vote in percentage points when the Democratic Party (panel A) or the Republican Party (panel B) won the election race. Length is the natural logarithm of the geometric average of the sum of "the", "and", and "of". We control for type of contract. Data are from the SEC's EDGAR database and the CQ Voting and Elections Collection. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Winning Margin Dummies Effect on Public Contract Rigidity Clauses by Political Party

Panel A: Democratic States

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Small winning margin	0.0849	0.0606	-0.0907	0.110	0.0742	0.0220	-0.184
	(0.54)	(0.65)	(-0.86)	(0.90)	(0.88)	(0.20)	(-1.15)
Length	-0.465***	-0.141***	-0.0704	-0.246***	-0.296***	-0.308***	-0.781***
	(-5.39)	(-3.31)	(-1.44)	(-3.80)	(-8.44)	(-6.81)	(-11.48)
Constant	-1.561***	-3.326***	-2.818***	-3.170***	-2.365***	-1.371***	-0.520
	(-3.05)	(-12.50)	(-9.43)	(-8.03)	(-10.90)	(-5.03)	(-1.09)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	149	247	251	155	291	268	89
Adjusted R^2	0.197	0.061	0.013	0.099	0.194	0.164	0.608

Panel B: Republican States

	(1) Arbitration	(2) Certification	(3) Evaluation	(4) Litigation	(5) Penalties	(6) Termination	(7) Design
Small winning margin	0.548***	-0.208**	0.201**	0.378***	0.0593	0.118	-0.0825
	(3.49)	(-2.42)	(2.19)	(3.22)	(0.81)	(1.10)	(-0.90)
Length	-0.477***	-0.0310	-0.0439	-0.358***	-0.268***	-0.226***	-0.772***
	(-6.81)	(-0.89)	(-1.25)	(-6.31)	(-9.95)	(-5.95)	(-18.78)
Constant	-1.777***	-3.825***	-3.183***	-2.597***	-2.442***	-2.136***	-0.879***
	(-4.10)	(-17.13)	(-14.90)	(-7.25)	(-14.67)	(-9.14)	(-3.36)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	193	329	375	225	387	361	154
Adjusted R^2	0.203	0.029	0.018	0.165	0.200	0.083	0.714

Table 20: This table presents results from OLS regressions of total amendments to total documents per public company on political contestability variables. Average amendments is the ratio of the total number of amendments to total number of filings per public company. Average winning margin is the difference between the average of the winner's and the runner-up's share vote in percentage points; average small winning margin is a the average of the dummy variable equal to one when the winning margin is narrow (below 10%); and average political opposition strength is measured as the average of the Herfindahl-Hirschman Index (HHI) of residual (non-winning) parties' vote share in general elections weighted by the overall non-winning vote share in general elections. Controls include: the natural logarithm of sales in US$ and type of contract (license or sale/procurement) and state fixed effects. Data are from the SEC's EDGAR database. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Political Contestabilty Effects on Average Amendments in Public Contracts

	(1) Avg. Amends	(2) Avg. Amends	(3) Avg. Amends	(4) Avg. Amends	(5) Avg. Amends	(6) Avg. Amends
Avg. winning margin	0.00150	0.000790				
	(0.72)	(0.28)				
Avg. winning margin dummy			-0.0638	-0.0595		
			(-1.41)	(-1.07)		
Avg. political opposition strength					0.154	0.701
					(0.51)	(1.36)
Sales	0.0113	0.00814	0.0121	0.00864	0.0119	0.00826
	(1.33)	(0.85)	(1.43)	(0.90)	(1.40)	(0.87)
Constant	0.602***	0.672***	0.647***	0.723***	0.565***	0.429
	(8.61)	(3.15)	(9.92)	(3.37)	(4.29)	(1.54)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes	No	Yes
Observations	360	360	360	360	360	360
Adjusted R^2	0.002	-0.006	0.006	-0.003	0.001	-0.000

Table 21: This table presents results from OLS cross-section regressions of private contract length on political contestability variables. Winning margin is the difference between the winner's and the runner-up's share vote in percentage points; small winning margin is a variable equal to one when the winning margin is narrow (below 10%); and political opposition strength is measured as the Herfindahl-Hirschman Index (HHI) of residual (non-winning) parties' vote share in general elections weighted by the overall non-winning vote share in general elections. Controls include: governor's tenure in office, type of contract (license or sale/procurement), and state fixed effects. Data are from the SEC's EDGAR database and the CQ Voting and Elections Collection. Sample period is 1998–2013. Standard errors are in parentheses; * denotes significance at 10%, ** significance at 5%, and *** significance at 1%.

Political Contestability Effects on Private Contract Length

	(1) Length	(2) Length	(3) Length	(4) Length	(5) Length	(6) Length
Winning margin	0.00131	0.00450**				
	(0.75)	(2.06)				
Small winning margin			-0.0577	-0.0604		
			(-1.58)	(-1.42)		
Political opposition strength					0.0160	-0.0829
					(0.06)	(-0.21)
1st year in office	-0.0270	-0.0284	-0.0276	-0.0350	-0.0298	-0.0374
	(-0.51)	(-0.53)	(-0.52)	(-0.66)	(-0.57)	(-0.71)
2nd year in office	0.0849*	0.0848	0.0842	0.0802	0.0835	0.0794
	(1.65)	(1.64)	(1.64)	(1.55)	(1.62)	(1.54)
3rd year in office	-0.0660	-0.0633	-0.0668	-0.0638	-0.0659	-0.0637
	(-1.33)	(-1.27)	(-1.35)	(-1.28)	(-1.33)	(-1.28)
Constant	5.025***	5.451***	5.066***	5.547***	5.038***	5.537***
	(93.47)	(8.75)	(102.54)	(8.90)	(44.57)	(8.58)
Type of contract	Yes	Yes	Yes	Yes	Yes	Yes
State fixed effects	No	Yes	No	Yes	No	Yes
Observations	5979	5979	5979	5979	5979	5979
Adjusted R^2	0.003	0.012	0.003	0.011	0.003	0.011