

Political Longevity and Collusion in Public Procurement Auctions*

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Abstract

We investigate the relationship between the time politicians remain in power and the functioning of public procurement auctions. If “it takes time to make friends”, one would expect long-lasting mayors to collude more with local bidders as far as political longevity increases. On the other hand, if mayors could learn to better administer the procurement process as far as they make experience, the opposite should hold. To disentangle between these two hypotheses, we use a dataset on the Italian municipal governments and all the public procurement auctions they administered between 2000 and 2005. Identification is achieved through the introduction of a two-term limit in March 1993: since the reform was not retroactive, mayors appointed right before the implementation could be reelected for two additional terms, while the others for one only. Assuming no manipulation of election timing, we use the year of election (before or after 1993) as an instrument for the actual time in office. Our primary finding is that political longevity deteriorates public spending. In fact, it decreases the number of bidders and, most importantly, the winning rebate. Interestingly, we also find that the probability that the winning firm is an insider, or that the contract will be *ex-post* renegotiated, increases with political longevity. We interpret these figures as evidence that repeated interactions between politicians and contractors increase the chances of collusion at local level.

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1 Introduction

Political authorities make frequent use of procurement contracting to realize works in outsourcing, the objective for the contractor being the minimization of public expenditure under the provision of a certain quality.¹ However, the miss-practice of using these contracts to strategically allocate public funds to interest groups is widespread, and it grants incumbent politicians a powerful tool for consolidating their political consensus through favoritism, and eventually get bribes.

While there is evidence that political connections drive the allocation of procurement contracts (Goldman et al. 2008a), even when this is done through competitive auctions (Hyytinen et al. 2007), little is known, however, about their process of making.² If it takes time for bidders to establish a preferential relationship with the political authority, the periodic replacement of the person who is in charge for the assignment might indeed break collusion, thus improving the efficiency of procurement mechanisms. This is not the case if connections could be set up instantaneously at the beginning of each electoral term, or if candidates already had established acquaintances upon election, in which case the level of collusion should remain stable throughout the elective office. On the other hand, there might be a learning process, with politicians acquiring the skills for designing and administrating the procurement mechanism, and finally improving public spending. Whether there is an effect of political longevity over the functioning of public procurement remains, therefore, an empirical matter.

In this paper we address this question using a dataset on the Italian mayoral terms, and all the public procurement auctions they administered between 2000 and 2005. The institutional framework is particularly suited for the analysis because all the municipal procurement auctions are sealed-bid, which reduces the possibility of complex strategic behaviors among bidders, and single-attribute (i.e., price only), which instead simplifies the identification of deceitful behaviors.

¹The average total expenditure for government procurement, excluding defense expenditure, accounts for almost 14.5 (12) percent of the GDP of all OECD (Italy) Members (Audet, 2002).

²More broadly, there is wide empirical evidence showing that political connections boost firms' performance (Cingano and Pinotti, 2009; Dombrovsky, 2008; Faccio, 2006; Ferguson and Voth, 2008; Fisman, 2001; Goldman et al. 2007b), and that politicians benefit from having control over firms (Sukhtankar, 2008).

For identification purposes, we exploit the introduction of a two-term limit on March 27, 1993. Since the term limit applied to the terms elected after the reform only, mayors appointed before the reform could be re-elected for two additional terms, while those elected after the reform for one only. Under the assumption that the timing of election could not be manipulated, but it was the result of an historical and idiosyncratic scheduling, we use the time of election (before or after March 1993) as an instrument for the time in office, and analyze the impact on a series of outcomes characterizing the functioning of public tenders. The quasi-experimental framework also allows us to disentangle the effect of political longevity from the effect of the lack of electoral accountability (e.g., Besley and Case, 1995; Ferraz and Finan, 2008), as mayors elected after the reform will face the term limit when in the second term, while those elected before the reform will face it when in the third or more.

To correct for the simultaneous introduction of another reform —the direct election of the mayor— that might have affected the quality of the treated and the control group differently, we implement a fuzzy Regression Discontinuity Design focusing on the elections held right before and after March 1993. In fact, while the term limit applied sharply after the reform, the implementation of individual-ballot elections was instead more resilient, because of the initial difficulty for parties to recruit candidates more suitable to the new electoral system.

Main results show that, when the same politician remains in power for an additional term, there is a progressive reduction in the number of bidders participating in the auctions (-15.27 percent) and, more importantly, a reduction in the winning rebate (-11.48 percent). A back to the envelop calculation suggests that an average public work costs 8,000 euros more in municipalities with a third term mayor, as opposed to a second term mayor.³ At the same time, we find that having the same mayor in power for an additional term increases the probability that the contract will be awarded to a local firm (+10.44 percent), or to the same firm repeatedly (+14.57 percent). On a subsample of regions for which we have data on the renegotiation of the contracts, we also find that political longevity increases the probability that there will be a disadvantageous *ex-post* renegotiation of the

³This calculation refers to public works with an average starting value of 541,000 euros, and does not account for contingent *ex-post* renegotiations, which by law represent only an extra cost for the contracting authority.

terms of the contract, both in terms of delaying the delivery (+16.5 percent) and in terms of costs (+15.8 percent). We interpret these figures as indirect evidence that longevity, as opposed to political turnover, comes with an increasing collusion between the incumbent mayor and the bidding firms.

These results have two important policy implications. First, from the point of view of a regulator interested in rationalizing public spending, they suggest the introduction of policies favoring political turnover (e.g., the term limit). Second, as far as the functioning of procurement auctions is sensitive to repeated interactions between politicians and contractors, they suggest the introduction of policies aimed at limiting the power of politicians over the auction mechanisms (e.g., centralized purchases at national level, or limiting the discretion of a politician in awarding *ex-post* renegotiations).

The rest of the paper is organized as follows. In Section 2, we review the related literature and outline the conceptual framework that we will use to interpret the data. In section 3, we describe the Italian institutional background, and in Section 4 we explain the results of the empirical analysis. In Section 5, we describe the estimation strategy. In Section 6, we present the main results, and in Section 7 we conduct some sensitivity analysis. We conclude with Section 8.

2 Related Literature and a Model of Building Collusion

2.1 Related Literature

Our paper is related to a number of recent papers studying the relationship between political stability and corruption. Gamboa-Cavazos et al. (2008) use firm-level data for Mexico on extra-official payments made to public authorities, to show that the political clout exerted on a state government affects corruption in a non-linear manner: they find that corruption is more intense over long and short political horizons, and less intense over intermediate ones, because of a combination of “horizon” and “capture” effects. In the first, politicians prey more intensely on firms as their window of opportunity shortens, and thus command large corruption payments. In the second, entrepreneurs tend to bribe government officials over long and feasible policy horizons. Using cross-country

data, Campante et al. (2008) find a similar U-shaped relationship between corruption and political stability. Despite the similarities, it is important to stress that, while these papers study the effect of the remaining time in office (the political horizon) on unlawful behaviors, we focus instead on the elapsed time in office (the political longevity). As it will become clearer in the next section, this approach has very different theoretical implications, including the absence of non-linearities. With this respect, our paper is closer to Besley and Prat (2004), who find a positive and linear correlation between political longevity and corruption.

More broadly, there is an increasing interest in analyzing the way political competition affects economic outcomes. Some authors argue that the lack of political competition may lead to policies that hinder economic growth, because dominant parties have less incentives to appeal to swing voters, who are not committed to one party and are prepared to vote against candidates pursuing distorted policies (Besley et al., 2007; Polo, 1998). Others argue instead that, as far as political leaders are constrained by the threat of entry, regimes with no challengers may nonetheless implement policies in the public interest and carry out long-term reforms without the need to please small but pivotal interest groups (Mulligan and Tsui, 2008).⁴ Under certain conditions, political longevity may be seen as a result of the lack of political competition.

Our paper also contributes to a recent empirical literature on corruption which makes use of direct measures of shadow behaviors, like the unlawful administration of public goods, or the amount of bribes, rather than the more traditional opinion surveys.⁵ Among the others, Bandiera et al. (2008) study the introduction in Italy of a centralized purchasing authority (*Consip*), and find that the waste of public funds is mostly generated by red tape rather than bribes, and that there are sizeable cost reductions in centralizing the purchase of standardized goods because contractors compete in an environment with higher potential competition. Ferraz and Finan (2008) use the audit reports from an anti-corruption program in Brazil to construct new measures of political corruption in local governments and test whether the term limit rule affects the corruption practices of

⁴Conconi et al. (2009) find that in the U.S. Congress trade liberalization reforms are more easily undertaken when politicians serve longer terms, the reason being the possible divergence between the political and the reform horizons.

⁵See Rose-Ackerman (1999) for a survey of early studies.

incumbent politicians. They find that mayors with re-election incentives misappropriate fewer resources than mayors without re-election incentives.⁶

At theoretical level, we borrow from a wide literature which studies the way a principal can manipulate an auction to favor one of the bidders, in exchange for a bribe. Some authors have emphasized the importance of specific weighting rules to help reducing the importance of manipulative attributes (Laffont and Tirole, 1991; Burguet and Che, 2004).⁷

Finally, our paper relates to a recent empirical and theoretical literature which analyzes public procurement contracts under the possibility of *ex-post* contractual adjustments. Examples include Guasch et al. (2008), who examine the *ex-post* contractual renegotiations of procurement contracts for utility concessions in a group of Latin American countries. Bajari and Tadelis (2001), Bajari et al. (2008) and Bajari and Lewis (2009) also examine the procurement of construction contracts, and argue that procurement contracts are often incomplete because of the initial specifications can be refined after the contract is awarded, resulting in a higher final cost. However, these analyses ignore the possibility that the bidders might have a preferential relationship with the auctioneer, who could reward them with a favorable renegotiation. Along this line, Engel et al. (2006) consider a model where the auctioneer is also an elected politician, and the *ex-post* renegotiation of the concession contract is used by the politician to increase the probability of winning the upcoming election.

Compared to this literature, the contribution of our paper is twofold. First, we bring novel empirical evidence on the link between political longevity and the way public procurement auctions are administered. Second, we highlight a new mechanism to mitigate favoritism in the procurement market, that is, political turnover.

⁶See also Di Tella and Schargrodsky (2003).

⁷Rather than the vertical collusion between the auctioneer and a bidder, another strand of literature has focused on the horizontal collusion among bidders (the so called “bidding rings”). See Robinson (1985), Graham and Marshall (1987), and McAfee and McMillan (1992).

2.2 The Model

In this section we discuss the intuition of a model of building collusion in public procurement auctions that underlies the empirical analysis. The model highlights three key characteristics of public procurement auctions: The buyer of the good (citizens) delegates an agent (politicians) to procure it; their potential vulnerability to the exchange of favors between local politicians and local contractors; and their repeated nature over time that may presumably help to build collusive relations. The model predicts that collusion between a mayor and a local contractor is built gradually with the repeated interactions and it has a direct effect on the outcomes of the procurement auctions.⁸

We assume that collusion in auctions happens in a sequence of two-stage. In the first-stage a mayor and a contractor may reach a collusive agreement such that the mayor in exchange of a bribe or political support will: 1) reveal only to the bidder the distribution of the bids submitted by her rivals; 2) she will allow the favored bidder to adjust her original bid. Non-preferred bidders form believes on the probability that the auctioneer has reached an agreement with one bidder. In the second stage the auction takes place. The same two-stage is repeated many times.

We discuss the two-stage of the model backward. First, we consider the effects of an exogenous increase in the probability of having a local bidder that is favored by the mayor on the outcomes of an auction; second we present the conditions that may induce a collusive agreement between a mayor and a local bidder in a repeated game framework. We focus on a particular sub-game, a snap-shot of the infinite game, and argue that its properties are true in any other sub-game, hence in the entire game.

2.2.1 Stage 2: Procurement auctions with a favored bidder

We adapt a model of favoritism in auctions to the framework of repeated interactions, Arozama and Weinschelbaum (2009). At any point in time (t) for $t = (1, 2, \dots, T)$ a mayor manages one auction.⁹ This mayor may have reached a collusive agreement with a local bidder that will be granted the right of learning her rivals' bids and to change her original

⁸In Section 2.2.3 we discuss a number of the modeling assumptions, while we provide part of the mathematical formulation of the model in Appendix.

⁹We consider a model on the effects of favoritism in auctions where procurement is an application.

bid. If a bidder is not colluding with the mayor believes that one of her rivals is colluding with probability p_t .¹⁰

In each auction there are N bidders. Their valuations ν_i are identically and independently distributed with c.d.f. $F(\nu)$ and p.d.f. $f(\nu)$, with support over the interval $[\underline{\nu}, \bar{\nu}]$ within the independent private value framework. $F(\nu)$ is assumed log concave, hence the ratio $\alpha(\nu_i) = \frac{F(\nu_i)}{f(\nu_i)}$ is increasing. There is a fix cost of participation to the auction c , and both the bidders, and the auctioneer are risk neutral. Each auction is a sealed bid first-price, for a single-object, and with no reserve price.

The preferred bidder, denoted by d , observes b^h and may opt to set $b_d = b^h + \varepsilon$ comparing her v_d with b^h using his *right-of-first-refusal*. The $N-1$ non-favored bidders face, symmetrically, one favored rival, with probability p_t . They all know about the local favored bidder and compete against the preferred rival valuation instead of her bid. Bidding and participation to the auction are granted by the fact that some bidders evaluate the good more than the favored bidder.

In this set-up it is possible to show that the coalition's (mayor-local bidder) expected utility is larger when there is collusion, while the expected utility of a non-preferred bidder is strictly decreasing in the probability of collusion. The following predictions may be observed in the data:

Prediction 1: The equilibrium number of active bidders is non-increasing in the probability of collusion p_t .

Under the additional assumption that $\alpha(\nu_i)$ is strictly concave,

Prediction 2: The higher the probability of collusion p_t the less aggressive are the bids of non-preferred bidders.

2.2.2 Stage 1: Building collusion

We adapt a model of gradual diffusion of cooperation in community to our framework of collusion between mayors and local bidders, Gosh and Ray (1996).

At any point in time (t) for $t = (1, 2, \dots, T)$ a mayor and a bidder play a collusion game. The players, simultaneously, face the choice of whether or not to collude. The symmetric

¹⁰We avoid the use of the (t) subscript when it is not-necessary.

pay-off game is such that if players collude there is a benefit for both players, but each player is better off if the other decides unconditionally to collude, while opting herself for non-collusion. If illegal activities have a cost, non-collusion is the single strictly dominant strategy of the one shot game for both players no matter how many times the game is repeated.¹¹

If at time T there is a probability τ that the game between a mayor and a bidder continues, the threat of future retaliation may induce collusion.¹² In this simplified set-up, the number of past interactions do not matter for the probability of collusion that it is reached instantaneously when players are enough patient. To enrich the dynamic we assume that: First, every period players are match at random, but they also have the possibility of deciding to continue to play with old opponents. Second, the population of players is non-homogeneous. Some players, mayors and local contractors, have similar discount factors that is higher than for non-local contractors. Third, the information on other players types are not perfectly observed until the first interaction happens. Fourth, at any date the pool of unmatched players is formed by a fraction π of local contractors, and this fraction is constant over time.

At each date, pairs occurs and the collusion game is played by pairs of players. After the stage game is played in every period, each player in any pair has the option to continue or not the previous relationship. If both players decide to continue they repeat the game between themselves with probability τ that the game will continue. If the relationship is broken by one of the players, they both return in the pool of unmatched players. Under this set-up the equilibrium is characterized by a phenomenon of gradual building of collusion. In the first phase patient players (mayors) offer a testing level of cooperation to newly meet opponents (contractors), reciprocation of which serves as a signal that the opponent (local contractors) has the same discount rate and collusion is possible in the second phase. The model delivers an equilibrium with the following dynamics of collusion and the behavior of the players in either phase is individually incentive-compatible and

¹¹By backward induction it is possible to show that non-collusion is the equilibrium outcome of the same T (finite) times repeated game.

¹²It is possible to prove that cooperation is an equilibrium in a standard one shot prisoners' dilemma game when players are enough patient and there is a probability of continuation of the game. Also, If the payoffs in the continuation game are larger, the probability of continuation can be very small and collusion an equilibrium.

also bilaterally rational:

Prediction 3: The probability of collusion between mayors and local contractors increases over time, $p_{t+1} > p_t$.

In the empirical analysis, we will bring the predictions of the model to the data and test whether an exogenous variation of the time spent in office by the mayors (i.e., our proxy for the probability of collusion between mayors and local contractors) affects the outcomes of procurement auctions (i.e., the number of the bidders, the winning rebate, the incumbency of the winner, the probability that the winner is local, and the *ex-post* renegotiations of the procurement contracts).

2.2.3 Brief discussion of the assumptions of the model

Our model considers the possibility of favoritism in exchange of a bribe in a first-price auction. A more realistic model would consider that the winner of the auction bids the highest value below the *averaged-average*, and a mayor may use strategically the *ex-post* renegotiations of the procurement contract.¹³ Hence, non-favored bidders will compete against a favored bidder that eventually observes a particular moment of the distribution of the bids, and benefits from an *ex-post* renegotiations of the procurement contract. A non-favored contractor may still win provided that there is enough heterogeneity in the distribution of the bids. We think that a more complicated model would not give qualitatively different predictions from the simpler model we analyze.

In the collusion game we assume that for a given bribe the probability of collusion with a local contractor is higher than with non-local contractors. Moreover, we assume that there is no-competition in bribing the mayors, and no-collusion between bidders, Compte et al. (2005). We follow the recent evidence of favoritism under social pressure to simplify the dynamics and rest on the fact that mayors may feel the social pressure of helping local contractors, Garicano et al. (2005). The dynamics of the effects of having both vertical and horizontal collusion are left for further research.

¹³The *averaged-average* is the sum of the average of the bids and the average computed with the upper deviations from the average. In Section 3 we discuss the details of the procurement mechanism and the *ex-post* renegotiations.

To use the results of the theory of repeated games we assumed that at a generic time T there is a probability τ that the collusion game is repeated. This assumption is partially testable. We exploit our database on the career of the mayors, and estimate that on average 7% of the mayors become president of one of the 108 Italian provinces, the closest political office above municipalities. We also look at the size and the frequency of public work at provincial level. Between 2000-2005, provinces administered frequent (10 per term) and relatively valuable (650,000 euros) public works. Hence, both the probability that the games continues and the potential payoffs of collusion make future valuable. We live for further research what determines the political career of the mayors.

Finally, we assume that mayors and local contractors discount the future at a similar rate higher than the one of non-locals. The construction sector in Italy is characterized by small contractors, mostly operating locally and being competitive in non-local markets is harder. Bidding preparation, and transportation costs may have a sizable effect on small non-local contractors. Hence, for a local contractor an opportunity in her local market is more valuable than in non-local markets. To render the model more tractable we normalize the discount factor on non-local bidders to zero. Hence, if a random match happen with a non-local there is zero probability that the mayor will collude with her. In the empirical analysis we test the assumption that the probability of collusion is higher with local contractors.

3 The Institutional Background

The Italian municipal administration (*Comune*) is headed by a Mayor (*Sindaco*), who supervises the Executive Committee (*Giunta*), and a Council (*Consiglio Comunale*) which endorses the policies proposed by the mayor with majority rule. The functions of a municipal administration, besides contracting for public works, include the provision of public transportation, some welfare (like assistance to elderly people, nursery schools, and public housing), and managing public utilities (like water, electricity, and gas). In 1993 the mayoral electoral system was changed from a party-ballot to an individual-ballot, and a two-term limit was introduced.¹⁴ In 2000 the statutory duration of the legislature was

¹⁴We will discuss extensively in Section 5 about the term limit regulation.

extended from four to five years.

Municipalities are required to administer public tenders for both the purchase of goods and services and for the realization of public works. Tenders are regulated by the *Legge 109/94*, and several amendments (“*Merloni-bis, -ter*”, as they were called), which coordinate all the proceedings of the procurement process.¹⁵ For the sake of this exercise, we focus on procurement auctions for the realization of public works. Auctions are sealed-bid, and multi-attribute or single-attribute depending on the size and the complexity of the public work. During the period 2000-2005, we only observe single-attribute auctions, i.e., auctions for which the technical component of the offers plays no role in the assignment, provided that the winner satisfies some minimum quality standards which are set by the contracting authority. Firms bid the price at which they are willing to do the works, in the form of a percentage reduction (a rebate) with respect to the auction’s starting value (also called the reserve price). The starting value is set by an engineer employed by the municipal administration, following a price-list of the standardized cost for each type of work. In this sense, the starting value cannot be manipulated to favor any colluded bidder with or without a capacity constraint.¹⁶

Because of the complex awarding criterion, the highest rebate is not necessarily the winning rebate. In order to prevent firms from over-bidding (that is, bidding a price which does not allow to recoup works’ expenses) a complex mechanism is implemented (see Figure 1). After a preliminary mechanical trimming of the top/bottom 10 percent of the collected bids, the bids which exceed the average by more than the average deviation are further excluded. Bidders have to guess this averaged-average “anomaly thresholds”, trying to place the bid just below it.¹⁷ The fact that the work is assigned to the bid closest to the anomaly thresholds from below is particularly important in our case, because it leaves some competitive pressure for increasing the rebate. This is not the case, for example, in other similar auction mechanisms like a pure average bid auction, where the winning bid

¹⁵In the late 1990’s the national government introduced a central procurement agency for the purchase of goods and services, *Consip*, although municipalities could still choose to run their own auctions.

¹⁶The cost of work-safety is excluded from the auction and cannot be subject to rebate.

¹⁷As for illustration, consider this simple example. In a hypothetical auction, after the trimming of the tails there are three participants placing the following bids (rebates to the auction’s starting value): 10, 14 and 16. The average bid is thus 13.33. The average difference of the bids above this average bid is 1.12. Thus the anomaly thresholds is 14.44. It turns out that in this case the winning bid is 14, well above the average, even if 16 percent is the highest bidden rebate.

is the closest to the average no matter whether from above or from below.¹⁸

Each auction is administered by a manager, who is appointed by the mayor among the bureaucrats working in the municipal administration.¹⁹ The manager supervises the whole procurement process, including the preparation of the preliminary project, the advertisement and the administration of the auction, the payments to the winning firm (upon initial approval of the city council), and monitors the realization of the work. The participation to the auction can be of three types: in the *Pubblico incanto* participation is open to any firm satisfying some technical requirements; in the *Licitazione privata* the contracting authority invites a number of firms to participate, provided a minimum number is satisfied; finally, in the *Trattativa privata*, the contracting authority still invites a number of firms, but in a limited number.²⁰ The law prescribes the cases under which each specific auction format can be used, although the municipal authority still retains some discretion in the final tailoring of the auction format.

Finally, the law specifies the cases in which the terms of the procurement contract (the time of the work delivery, and the cost of the work) can be renegotiated. In particular, renegotiations are admitted only in cases of unforeseen natural events (like storms, earthquakes, landslides, etc.), and are discretionally granted by the auction manager without the further approval of the city council.

4 The Data

We use an administrative data set about all the Italian mayoral terms elected between 1985 and 2007, provided by the Italian Ministry of Interiors. The data set contains information on the identity, gender, age, highest educational attainment, political affiliation, and previous job of the elected mayor. It also contains information on the legislature, such as the exact duration and the reasons of any eventual early termination, and the electoral results. Finally, we also have yearly information at municipality level about the size of

¹⁸The properties of this awarding mechanism are not easy to prove and are beyond the scope of this paper. For a discussion, see Albano et al. (2006) and Decarolis (2008).

¹⁹In our sample, 37 percent of the times the manager is replaced when a new mayor is elected.

²⁰Other formats include the *Licitazione privata semplificata*, which is very similar to the *Licitazione privata*, and the *Appalto concorso*, which is used for works with a high architectural content starting from 300,000 euros.

the resident population, the total revenues and expenditure, plus some demographic characteristics as of 2005, like the disposable income per capita, the labor force participation rate, the number of productive units per capita, the elderly index, and the population density and the resident population at the 1991 census.

We combine the mayoral information with a data set about the public procurement auctions, which is provided by the Italian Authority for the Surveillance of Public Procurement (“*Autorità per la Vigilanza sui Lavori Pubblici*”, *AVLP*), which collects data on all the public procurement auctions for public works, with starting value greater or equal to 150,000 euros. For our analysis, we refer to the data collected between 2000 and 2005. The data set includes information at auction level about the number of bidding firms, the starting value, the identity of the winning bidder, and the typology of the work. For three regions (Trentino-Alto Adige, Piemonte, and Lombardia) we also have two measures of the *ex-post* renegotiation (if any): the extra time to accomplish the work, and the increase in the realization cost. Each procurement auction is assigned to the mayoral term which overlaps with the date of bids’ delivery, although the realization of the public work might go beyond that term.

4.1 Descriptive Statistics

The initial sample consists of all the cities for which we observe at least one auction between 2000 and 2005, and without missing information on the most relevant variables (the number of bidders, the winning rebate, and the starting value of the auction, and the political longevity of the mayor).²¹ To maximize sample size, we assign the sample mean to other variables with missing data (the budget deficit, the average income per capita, whether the mayor was born in the city, the mayor’s previous job and education, the number of parties in the mayor’s coalition, and fraction of seats in the mayor’s coalition), and include a dummy for missing status for these variables. These procedures increase our sample size by about 17 percent and allow us to obtain more precise estimates.²² We further excluded cities with less than 500 inhabitants to avoid limiting size effects, and those who had an early termination in the past to avoid irregular electoral cycles. In Table

²¹Of the 8,104 existing Italian municipalities, 3,668 had no auctions between 2000 and 2005.

²²All the results are qualitatively and quantitatively robust to the exclusion of all observations with any missing data.

1 we present summary statistics for the sample of municipalities over which we will run the estimation analysis.

The final sample is made of 3,848 cities, 40 percent located in the North-West of Italy, 20 percent in the North-East, 14 percent in the Center, 22 percent in the South and only 4 percent in the Islands. The average municipality has 11,689 inhabitants, and the total number of mayors is 5,241 (see Table 2). Only 8 percent of the mayors are women, the average age is 50, the average political experience (in any municipal office) in the same municipality is 7.42 years, the average previous years in office as mayor are 2.29, while the average number of previous terms is 0.53. 39 percent of the mayors face a term limit, and 84 percent were born in the same province of the municipality. About 45 percent have a college degree, while 44 percent have a high-school degree and 11 percent a lower-secondary degree. Almost 12 percent were not employed before being appointed, the majority being self-employed (43 percent), followed by entrepreneurs (33 percent), blue collars (4 percent) and the rest being clerks. Finally, 75 percent had been elected with a center-left party, only 11 percent with a center-right party, and all the rest were in a center-wing, independent or separatist party.²³

Note that these averages represent the mean value for the part of the term we observe. Some terms, however, may be right or left censored depending on whether they were elected before 2000 or to be concluded after 2005, which might introduce some additional measurement error. While we could expect a certain homogeneity in the timing of procurement auctions within the term, and therefore the censoring not to be a relevant issue, we will include in the estimation an additional control for the time from the next scheduled election.

The data set contains a large number of measures that can help identifying the lack of competition in the procurement process and, indirectly, the possible collusion between the bidders and the mayor. We divide these measures in two sets: the *level of competition*, and the *nature of competition*. The *level of competition* set includes the number of bidders and the final percentage rebate over the reserve price. The *nature of competition* set includes an indicator for whether the winning firm is registered in the same province of

²³Since many parties are only local, we could not identify them with the major political wings and then classified them as independent.

the contracting authority, and the maximum number of adjudications to the same firm per term, weighted by the number of auctions. Finally, the *Ex-post Renegotiations* set, which is available for three regions only, includes an indicator for whether the delivery of the work exceeded the original contractual deadline, and an indicator for the cost of the work being raised after assignment.

We are aware that some of these measures do not represent an exact indicator for the lack of competition, and for the presence of collusion. For example, if bidders were colluding among themselves, the fact that the number of bidders increases when a new mayor is elected would not necessarily be a signal of higher competition. Or, since we do not measure the *ex-post* quality of the work, a higher winning rebate could imply a more approximate realization of the work. However, as outlined in Section 2.2, taken together all these measures can provide some interesting insights about the way political longevity can affect the functioning of public procurement contracts.

Table 3 describes the average characteristics of the auctions, where we excluded auctions with none or more than 100 bidders to avoid extreme cases. The total number of auctions we observe is 27,189. In 91 percent of the cases the selection criterion was the public participation (*Pubblico incanto*), the average number of bidders was 21.43, and the average winning rebate was 12.98 percent. The majority of the public works concern the construction of roads (23 percent), then schools (13 percent), public building (5 percent), public housing (1 percent), art-related constructions (4 percent). In 79 percent of the auctions for which we have this information, the price set at the time of the selection is later increased, and in 52 percent of the cases the contractual deadline is delayed. The average size of the public work is small, varying from 134,000 to 19,100,000 euros and with an average value of 541,000 euros.²⁴

5 Identification Strategy

We want to test whether the time spent in office by the same mayor affects the outcome of the procurement auctions administered in the city. We assume that the outcome of an

²⁴Values reported at 2000 equivalents, using the OECD CPI index.

auction i , managed by a mayor m , can be specified in the following linear form:

$$y_{im} = \alpha + \beta T_{im} + \delta_1 X_i + \delta_2 X_m + \nu_{im}, \quad (1)$$

where y_{im} is the outcome of the auction; T_{im} denotes the longevity in office of the mayor at the time of the bids' delivery; X_i is a vector of auction characteristics; X_m is a vector of mayor and city characteristics; and ν_{im} represents the disturbance term composed by a mayor specific fixed effect η_m and the usual white noise component ϵ_{im} . The main coefficient of interest is β . We perform the analysis at auction level, using for T_{im} both

r52Tf

5.1 The Electoral Reform: Instrumental Variables

In this section we address the endogeneity of political longevity (T_{im}). More colluded mayors, in fact, might be able to manage re-election more easily, and thus survive longer, if the rents produced by pro-collusive behaviors help politicians to be re-elected. Conversely, colluded mayors might have hard time to get re-elected if voters punish their unlawful or inefficient behavior in the ballot. The same argument applies if experience, rather than collusion, was a common determinant for both the re-election and the auctions' functioning.

We deal with this problem by exploiting an electoral reform, approved on March 27, 1993, which induced a variation in the potential political longevity of a randomly chosen group of mayors. Among other things, the reform introduced a two-term limit, which only applied to the terms elected after the reform, determining two groups of mayors: those elected for the first time before the reform (the treatment group) had a potential political longevity of at most three terms, as the first term was not included in the computation of the term limit; and those elected instead for the first time after the reform (the control group) had a potential political longevity of at most two terms. In Figure 2 we graphically illustrate the potential effect of the reform on these two groups. Here, the continuous lines denote the first term around the reform, while the shaded lines the potential additional terms the two groups of mayors can stay in office.

This institutional framework offers a unique natural experiment, because the timing of local elections is usually not synchronized (to a certain degree, any city has its own scheduling) neither between regions nor between provinces, which provides a source of heterogeneous variation across the country. For our identification strategy to hold, however, it is important that mayors could not anticipate the introduction of the term limit and went to election following the regular scheduling, in which case we could treat potential political longevity “as if randomly” assigned among mayors. Since the bill proposing the reform was first presented to the national parliament on July 4, 1992, and finally approved on March 25, 1993, we can confidently assume that the reform was indeed unexpected.²⁶

²⁶The reform was a response to the 1990-1992 political crisis generated by the judicial campaign “*Mani Pulite*”, which started a dramatic investigation on the corruption of local administrators. This judicial campaign led to the dissolution of the Christian Democratic Party (*Democrazia Cristiana*), which had ruled the country for over forty years, and to the end of the so called “*Prima Repubblica*” (First

To argue that some mayors did not systematically resign before the natural termination of the term to take advantage of a potential extra term, we will further inspect the frequency distribution of the election timing around March 1993, in search for any suspicious density jumps.

Figure 2 also shows that, as a by-product of the reform, some mayors happened to face a binding term limit when they were in the second mandate, while others when they were in the third mandate. Thus, comparing second term mayors with and without a term limit, or second term and third term mayors with a term limit, will also allow to separate the effect of longevity from the effect of the lack of electoral accountability, which is instead a major empirical issue in many other studies (e.g., Besley and Case, 1995; Ferraz and Finan, 2008).

Following the above discussion, we re-estimate equation (1) within a two-stage framework. As an exclusion restriction in the first stage, we use an indicator for whether the mayor was elected before March 1993, and then we add the full set of available regressors considered in the baseline specification. The resulting first stage equation is as follows:

$$T_{im} = a + bPR_m + c_1X_i + c_2X_m + \varepsilon_{im} \quad (2)$$

where, because of the term invariant nature of the instrument, T_{im} is the number of terms in office, and PR_m indicates whether the date of the first election was before March 27, 1993.²⁷

5.2 Multidimensionality of the Policy

One threat to our identification strategy comes from the validity of the exclusion restriction. The 1993 reform, in fact, also introduced other changes in the institutional setting that might have had a direct effect on the way public procurement auctions are

Republic).

²⁷Other estimation strategies could have been implemented. With repeated observation per mayor, over terms and over auctions, one may be tempted to exploit the longitudinal structure of the data. Under the assumption that unobserved collusion is time/auction invariant, and in presence of enough within-mayor variability, the fixed effect estimator is a powerful solution for the omission of any time/auction invariant characteristic, like the propensity to collude. We discard the panel data analysis for two reasons. First, we think that the assumption of time/auction invariance of collusion is not reasonable in our context, exactly because unlawful behaviors may grow along with longevity. Second, in our data the political longevity variable has a within-mayor variation smaller than the between-mayor variation, which makes it difficult to deliver precise estimates.

administered. Specifically, the reform changed the electoral system from party-ballot to individual-ballot.²⁸ The latter in fact may have led to the selection of better candidates, as opposed to the previous party-ballot, because the electoral competition was fiercer and citizens could select their most favorite candidate without parties interfering.²⁹ In principle, within the 2SLS sample (mayors in their second or third term as of 2000-2005), this selection bias is minimum, as all the mayors had gone through at least one individual-ballot election. No matter what was the selection effect of the new electoral system, we might also assume that, while the term limit applied sharply after the reform, the introduction of individual-ballot elections was instead more resilient, because of the initial difficulty for parties to quickly recruit, at local level, new candidates more suitable for the new electoral system. If so, focusing on mayors elected right before and right after the 1993 reform would remove any additional bias due to the different electoral mechanism for the treated and the control group. Using a naive version of the Fuzzy Regression Discontinuity Design (RDD), we first cope with the multidimensionality of the electoral reform by removing from the previous 2SLS estimates all the mayors who had been elected for the first time after a reasonable amount of time after the reform, while keeping all the mayors elected within 36 months before the reform as the selection mechanism under the party-ballot was in equilibrium.

To increase the precision of our estimates, we also consider the full sample of mayors elected before and after the reform. This gain in precision comes at the price of comparing a set of mayors possibly in their first or higher term at the time of the reform (the treated group), with a sample of mayors who were elected for the first time after the reform (the control group). As shown in Angrist and Imbens (1994), this heterogeneity in the potential treatment is relatively innocuous, under the monotonicity assumption, when using the 2SLS estimator. We therefore augment Equation (1) and (2) with a fully non parametric polynomial in the distance of the first election from the discontinuity threshold as follows:

$$y_{im} = \alpha + \beta_1 T_{im} + \beta_2 f(dist_m) + \delta_1 X_i + \delta_2 X_m + \epsilon_{im} \quad (3)$$

²⁸See Section 3 for more details.

²⁹Merlo and Mattozzi (2007) show that political parties may deliberately choose to recruit only mediocre politicians because they face the competition of a lobbying sector which pays higher wages.

and,

$$T_{im} = a + b_1 PR_m + b_2 g(dist_m) + c_1 X_i + c_2 X_m + \nu_{im} \quad (4)$$

where $dist_m$ denotes the time distance (in months) of first election from the 1993 reform, and $f(.)$ and $g(.)$ are flexible functions.

Since the running variable is not continuous, as elections are held at few points in time, we follow Card and Lee (2008) in specifying $f(.)$ and $g(.)$ as a series of time dummies, and properly correct the standard errors for the discreteness of the running variable.³⁰ As discussed in Lee (2008), the Fuzzy-RDD framework allows us to test for the validity of the exogeneity assumption by comparing a set of pre-intervention characteristics for the treated and the control group. If there were nonrandom selection around the 1993 reform, we should expect some of these characteristics to differ systematically.

6 Results

To begin with, in Figure 3 we plot the yearly averages of four variables which characterize the procurement process, for the case in which a second term mayor is replaced by a new mayor. These variables are: the total number of auctions, the average starting value per auction, the average number of bidders per auction, and the average winning rebate per auction. Looking at the figure, we do not detect any jump in the number and in the size of the public works over terms, but some within term variation in the number of auctions. This evidence suggests that the amount of construction activities is independent on the turnover cycle, and simply follows the necessities of the municipality.³¹ We find instead some preliminary evidence that the replacement of a longevous mayor revitalizes the functioning of the auction mechanisms. In fact, there is a clear positive jump in the number of bidders and in the winning rebate. Interestingly, the within term variability of the number of auctions is partially reflected in the within term variability of the number of

³⁰One possible concern with this estimation strategy is that mayor elected right after and right before the reform might face a different political horizon. While the concept of political horizon differs from that of political longevity (see the discussion in Section 2), one might take our estimates as the broad effect of a mayor organizing its political office over a longer period of time.

³¹As a matter of fact, the construction of large public infrastructures is determined well in advance within a process of bargaining between the central government, which allocates the transfers of public funds, and local municipalities.

bidders.³² We therefore focus the empirical analysis on the auction outcomes (the number of bidders and the winning rebate), and treat the amount of public works as if exogenously pre-determined.

6.1 The Effect on Collusion

In Table 4 we report the OLS results from fitting Equation (1) to the data. In Panel A and B we report the estimates for the number of bidders and the winning rebate respectively (the level of competition in the auction) for three different models' specifications. Estimates in columns 1 and 4 are computed considering the exact longevity in office (cumulated and consecutive) at the time of the bids' delivery. We first include only an indicator for whether the term limit is binding or not, while in columns 2 and 5 we include the full set of observable characteristics discussed in Section 5. Finally, in columns 3 and 6 we report the same estimates but replacing political longevity with the number of terms in office.

Estimates confirm the graphical evidence of a negative relationship between mayors' longevity and both the number of bidders and the winning rebate that we observed in Figure 3. The effects appear to be both statistically and economically significant. Depending on the set of controls, a one standard deviation increase in longevity (2.77 years) is associated with a decrease in the number of bidders by about 2-14 percent with respect to the sample mean (21.43 bidders), and with a decrease in the winning rebate by 1.6-8 percent with respect to the sample mean (12.98 percent). Similarly, a one standard deviation increase in the number of terms of political longevity (0.63 terms) is associated with a decrease in the number of bidders and in the winning rebate by about 2 percent in the fully specified model.³³ The estimated coefficients on the resident population are all positive and statistically different from zero for both outcomes at 1 percent level, suggesting remarkable size effects: the bigger the potential market, the higher the number of firms willing to compete. The coefficient on the starting value is also positive and statistically different from zero for both outcomes. This evidence is compatible with the idea that the

³²Similar figures, available upon request, hold when we consider the political turnovers induced by the term limit.

³³We leave the interpretation of the coefficient on the term limit for Section 7.1, where we explicitly address its endogeneity.

bigger the size of the public work, the greater the willingness of potential bidders to enter. Interestingly, this trend is reverted when the size of the work is too high (the square term, not reported, is in fact negative and significant), probably because of some production and financial constraints.³⁴ We also find a negative effect of the mayor's party longevity on the winning rebate, which makes us think that political parties might be another key player in the procurement assignment. We do not find instead any effect for the number of parties in the mayor's coalition, but for the percentage seats in the council belonging to the mayor's coalition, which is negative and statistically different from zero. The latter is evidence that non-contestable governments do not fear voters' monitoring and can relax on public spending.

Although the OLS estimates include a large number of observable characteristics, it could still be that the lack of competition induced by hidden collusive behaviors might help politicians to be reelected, and then severely bias the estimates. To take care of this potential endogeneity, in what follows we present the result of a two-stage least squares (2SLS) estimation using the shift in political longevity induced by the March 1993 reform as an excluded instrument.

Before presenting the 2SLS estimation results, we argue on the quality of the instrument. We first report evidence on the non-testable assumption that the election timing was orthogonal to the introduction of the reform, by graphically inspecting the frequency distribution of elections around March 1993. Figure 4 plots on the horizontal axis the time from January 1985 to January 2007, and on the vertical axis the frequency of the elections (in light brown) and the frequency of early terminations for any political reason (in green).³⁵ The figure highlights the main five election events between 1985 and 2008, and supports the assumption that elections were held with regular cycle, and with a timing determined by past events only. However, early terminations seem to be particularly high before the reform, probably because of the absence of a majority premium for the winning coalition. To check more carefully whether there is some mass distribution of early resignations around March 1993 that might threaten the identification strategy, we focus the

³⁴The law mentioned in Section 3 shapes the admission requirements as a function of the starting value of the auctions (increasing, concave, and discontinuous).

³⁵An early termination is any anticipated conclusion of the term for one of the following reasons: a) the resignation of the mayor; or b) the resignation of the majority of the council or a no-confidence vote in the council.

graphical inspection on a closer neighborhood of the reform. Figure 5 plots the frequency of elections between 1992 and 1994 only. There are actually a few elections which were held right before the reform because of an early termination (red full rectangles) and also a few elections which were held right after the reform because of a delayed termination (blue full rectangles). Most importantly, few of the mayors who postponed the election in order to wait for the reform got reelected (blue empty rectangles), and most of early terminations did not serve the purpose of anticipating the election to avoid the application of the reform.

As discussed in Section 5, another potential threat to the validity of the 1993 reform as an instrument for mayors' political longevity comes from the multi-dimensionality of the reform itself, which also introduced the individual-ballot election of the mayor. Mayors elected before and after the reform could differ in their observable and unobservable characteristics because of the different selection process they went through. However, if the introduction of individual-ballot elections was somehow resilient, because of the initial difficulty for parties to quickly recruit candidates more suitable to the new electoral system, we should not observe significant differences between mayors elected right before and after the reform. In Table 5 we report the sample averages of mayors' characteristics and behaviors by treatment status around the 1993 reform. We consider three different time windows, and report *p-values* to test for the statistical difference of the following indicators: gender, age, whether born in the province, whether employed at a high occupational level, whether has a college degree, the number of terms in office as mayor, the probability of being reelected, the budget deficit of the municipality, the resident population as reported in the 1991 Census, and an indicator for judicial efficiency. These variables, in principle, should meet the following two conditions: they should not be affected by the electoral reform, but they may depend on the same unobservable characteristics which are likely to affect the auction. In Panel A, we report the differences for a four years symmetric window (1989-1997): while we do not find differences in the characteristics of municipalities elected before and after the reform, we do find instead that within the four years after the reform there were systematically more females, mayors were less likely to be born in the city, they were more educated, more skilled and had a higher re-election probability. In Panel B we reduce the time window to two symmetric years (1991-1995),

and almost all the differences are no more statistically significant (except for the budget deficit that is higher after the reform, and the probability of being reelected which is also higher). Finally, when we restrict the time window to one year (1992-1994), all the differences disappear. Remarkably, the equalization of mayors' reelection probability is evidence against any potential sample selection bias, that is, mayors elected around 1993 had the same probability to survive until 2000-2005, which is when we observe the auctions. Importantly, the absence of any statistically significant difference between the two groups of mayors does not seem to be driven by the small sample in the one year window, as almost all the characteristics also equalize in terms of average magnitude, which is not the case when we use a four-year bandwidth. Hence, evidence seems to be more compatible with a long-run increase in the quality of the new elected mayors rather than a sharp change due to the 1993 reform.

Tables 6 and 7 report the 2SLS estimates of β for the number of bidders, the winning rebate, the probability that the winning firms is operating in the province, and for the maximum number of victories per firm (the level and the nature of competition in the auction) only for the sample of mayors elected for the first time 36 months before, and 18 months after the reform.³⁶

The first column in Table 6 reports the first-stage estimate of the effect of the reform on the actual longevity. As expected, mayors elected for the first time before the reform accumulate, on average, 0.923 terms more than mayors elected after the reform. The first stage F-statistic of the excluded instrument suggests that the instrument is relevant. In columns 2 and 4 of Table 6 we first report the OLS estimates on the 2SLS sample, to exclude any sample specific effects, while in columns 3 and 5 we report the second-stage estimates for the fully specified 2SLS model. We find that an increase in political longevity causes a 35 percent decrease in the number of bidders, which is 13.1 percent for the winning rebate. A back to the envelop calculation suggests that public works systematically cost roughly 10,000 euros more in municipalities with long-lasting mayors.³⁷

In Table 7 we report evidence on the effect of political longevity on the probability that the winning firms is operating in the province, and for the maximum number of

³⁶The estimates for the other windows are qualitatively similar and not presented.

³⁷Calculations refer to public works with an average starting value of 539,455 euros in the [-36 18] subsample.

victories per firm (standardized by the number of auctions per term). In columns 1 and 3 we first report the OLS estimates. Estimated coefficients are positive and statistically different from zero for both outcomes. In columns 2 and 4 we report the second-stage estimates (2SLS) for the fully specified model. Evidence suggests that an increase in political longevity causes a 24.5 percent increase in the probability that the winning firm is local, as well as a 43.2 percent increase in the maximum number of victories for the same firm. This is evidence that not just the level, but also the nature of competition, deteriorates when mayors stay in power for too long.

Table 8 reports the 2SLS estimates of the effect of political longevity on both the level and the nature of competition in the full sample of mayors, as discussed in Section 5. Column 1 presents the first-stage estimate, where we also include a fully non-parametric function of the distance between mayors' date of first election and the 1993 reform.³⁸ Mayors elected before the reform systematically accumulate 1.972 terms more, the first stage F-statistic suggesting that the instrument is relevant.³⁹ In columns 2-5 of Table 8 we report the second-stage estimates for the fully specified model. An increase in political longevity causes a significant 15.27 percent decrease in the number of bidders, which is 11 percent in the winning rebate, and a 10.44 percent increase in the probability that the winner is local. We do not find instead any significant effect on the maximum number of victories for the same firm. A back to the envelop calculation suggests that public works in the full sample cost roughly 8,000 euros more in municipalities with long-lasting mayors.⁴⁰

6.2 A Mechanism for Collusion

In this section we present some evidence on the effect of political longevity on any *ex-post* renegotiation of the procurement contract. 2SLS estimates suggest that the effect of an increase in political longevity of 0.859 terms on the probability of having either a time or a money renegotiation, amounts to 15.8 percent and 16.5 percent respectively (see columns 2 and 4 of Table 9). Both effects are statistically significant at 10 percent level. The OLS

³⁸We opted for a fully non parametric specification that includes two-years dummies, rather than a polynomial function, because it better suits the discreteness of the election scheduling. Estimates with a third order polynomial function are available upon request.

³⁹The first stage delivers an effect of two terms, instead of the expected one, because some of the mayors elected before the reform could have been already in office at the time of the election around March 1993.

⁴⁰Calculations refer to public works with an average starting value of 543,759 euros.

estimates (columns 1 and 3) are also positive, but not precisely estimated.

These results must be interpreted with particular caution, because the data on *ex-post* renegotiations are available for three regions only, and we had to take four departures from the previous estimates. First, to reduce the right censoring of the observed data we only consider the subsample of auctions held between 2000-2002, as *ex-post* renegotiations usually occur much after the bids' date of delivery. Second, instead of the full set of province dummies we include only two regional fixed-effects (Piemonte and Lombardia).⁴¹ Third, we control for the distance between the time of the renegotiation and the next election, instead of between the time of bids' delivery and the next election. Finally, instead of controlling for a fully non-parametric function of the time distance of the date of election from the reform, we include a third order polynomial of the distance, as the number of observations is much lower than with the other outcomes

7 Sensitivity Analysis

In this section we study the robustness of our analysis when the term limit is considered endogenous, and when we address the sample selection induced by the distance between the 1993 reform (the instrument) and the time we observe the auctions (2000-0205).

7.1 Endogeneity of Term-Limit

Another possible concern with our identification strategy is that the probability for a mayor to face the term limit maybe determined by the unobserved level of collusion, which would make it a second endogenous regressor in our model. To cope with this problem we extend our identification strategy considering close race elections, and compare the level of collusion in municipalities where the incumbent barely won the elections (and thus served a second-term with no possibility of reelection) with municipalities where the incumbent barely lost the election and thus was replaced by a new mayor.⁴² To overcome

⁴¹Results including the province fixed-effects are qualitatively similar to those presented in Table 9, but statistically significant at 5 percent only over the money renegotiations.

⁴²Lee (2008), discusses the sufficient identification conditions such that close race elections can be viewed as a quasi-experimental design where the treatment, being at the term limit or not, is determined as if randomly assigned across municipalities.

the typical trade-off between efficiency and bias of the regression discontinuity design, we augment our 2SLS regressions with a spline function in the margin of victory and the term limit. This allows us to consider the full sample of mayors in office between 2000 and 2005. The results are shown in Table 10. The effect of political longevity is still negative and statistically different from zero for all the outcomes, and similar in size to the one obtained in the baseline specification. Moreover, the indicator for a mayor at the term limit is negative and highly statistically significant only for the winning rebate.⁴³

7.2 Sample Selection

The results in Table 6 and 7 maybe biased if mayors elected before and after the reform had different re-election probabilities. Even if mayors elected one year around the reform have the same probability of being reelected than those elected after the reform, mayors elected before the reform had to pass one electoral round more. Thus, the electoral outcomes could bias our estimates, though the direction of the bias is not obvious *a priori*. To cope with this additional problem we estimate a fully parametric Heckman two-step sample selection model to correct for the different survival probability of the mayors in the 2000-2005 sample. We consider the pre-reform indicator as an exclusion restriction for the first step (i.e. the selection equation that model the probability of survival in the estimation sample) and augment equation (1) with a function of the predicted probability.

The second step OLS results are shown in Table 11, where we also include a sample selection correction (the so called Inverse of the Mill's ratio ($\frac{\phi()}{\Phi()}$) estimated with a probit model in the first step). For three out of four outcomes the effect of political longevity is similar both in magnitude and statistical significance the the baseline estimates, with the sample selection coefficient being not statistically different from zero.⁴⁴

⁴³In all the estimates we include a third order polynomial in the margin of victory, defined as the difference in the vote share between the incumbent mayor and the best rival, plus an interaction with the term limit.

⁴⁴We report cluster adjusted standard errors at mayoral level only, but we find similar results computing block bootstrapped standard errors clustered at mayoral level to account for the generated regressor bias.

8 Conclusions

In this paper we use a matched mayor-auction data set to provide novel empirical evidence on the extent to which politicians can influence the functioning of public procurement auctions in Italy. Our main result is that, when politicians stay in power for too long, there is a systematic deterioration in the functioning of the auction mechanism. In fact, we observe less bidders, a higher cost of the public work, an increase in the probability that the winner is an insider, and an increase in the probability that the contract will be *ex-post* renegotiated. These effects remain even after controlling for a large set of mayor and city characteristics (the term limit, the size of the municipality, the size of the project, the longevity of parties, the efficiency of the judicial system), and for the endogeneity of political longevity using an instrumental variable approach.

Our findings suggest that, in a setting with close and repeated interactions, the longer a politician remains in power the higher the probability of collusion with local players. This ultimately leads to a deterioration in the functioning of the auction mechanism and an increase in public spending. Importantly, this result highlights another channel through which political collusion could be eliminated and competition in public procurement restored, i.e., political turnover. Of course, we are aware that political turnover might have some drawbacks, especially when it creates instability by reducing the incentive for politicians to implement long-run policies. However, institutional features like the term-limit still prove to be effective in reducing collusion and rationalizing public spending.

Appendix A: The Model

Stage 2: Collusion in Repeated Auctions

A non-favored bidder i , each period/auction t , competes with probability p_t against the valuation of the favored bidder. Valuations ν_i are I.I.D. draws from the logconcave c.d.f. $F(\nu)$ and p.d.f. $f(\nu)$, and a non-favored bidder has bidding function $b_i^p : [\underline{\nu}, \overline{\nu}] \rightarrow \mathbb{R}$. We look for a strictly increasing strategies perfect Bayesian equilibrium symmetric among non-favored bidders, where $b_i^p(\nu) = b^p(\nu)$ for the $N - 1$ non-favored bidders.

We consider the maximization problem of a non-favored bidder that will choose her bid considering her strictly increasing inverse bidding function $\phi^p(\cdot)$:

$$\max_b (\nu_i - b) [p_t (F(\phi^p(b)))^{(N-2)} F(b) + (1 - p_t) (F(\phi^p(b)))^{(N-1)}] \quad (5)$$

where, in square brackets there is the overall probability that a non-favored bidder i wins the auction bidding b , and $F(\cdot)^{(N-2)}$ is the probability that a non-favored bidder defeats the $N - 2$ honest rivals, while $F(b)$ the probability of defeating the favored bidder.

We take the F.O.C.'s of equation 5, and consider a symmetric equilibrium where $\nu_i = \phi^p(b)$, and the following differential equation characterizes the inverse bidding function $\phi^p(b)$ with strictly increasing solution:

$$(\phi^p(b) - b) = \frac{[p_t (F(\phi^p(b))) F(b) + (1 - p_t) (F(\phi^p(b)))^2]}{p_t [(n - 2) F(\phi^p(b)) f(\phi^p(b)) (\phi^{p'}(b)) + F(\phi^p(b)) f(\phi^p(b))]}$$

$\nu(a) = \Pi(a, a)$, $d(a) = \Pi(0, a)$, and $l(a) = \Pi(a, 0)$, and assume that are continuous in a , and $\nu(a)$, the payoff of collusion, is strictly increasing in a . Both players have a benefit of choosing the same a , but each player, individually, has incentives to extract as much collusion from the other, while extending no collusion herself. The stage game has a unique Nash equilibrium where both players choose not to cooperate and get zero payoffs.

We assume that after any period/auction each player of a randomly matched pair mayor-contractor faces the decision to continue or terminate the ongoing relationship. In particular, we consider a scenario where at time T there is a probability τ that the game between a mayor and a bidder continues. If both players decide to continue the same stage game is played once more, otherwise they return in the pool of unmatched players. At any date, the match happens between two types of players: With probability π , constant over time, players (local mayors and contractors) have a high and similar concern about the future in the municipality, $\delta_{lm}^h = \delta_{lc}^h = \delta^h \in (0, 1)$. With probability $(1 - \pi)$ players (non-local mayors and contractors) care less about future interactions always choose the action 0 of non-collusion. Without loss of generality, we normalize their discount factor to zero, $\delta_{nlm}^l = \delta_{nlc}^l = \delta^l = 0$. We consider the discount factor of the first group of players as the continuation probability of the stage game (e.g., $\delta = \delta^h \tau$).

Finally, we assume that there is no information flow within the community, and all the information a player has at the beginning or end of any period/auction is her personal history up to that date. This information contains the actions taken by him and his various opponents in the past, and the continuation/termination choices made in each period.

As in Gosh and Ray (1996), we look for a social equilibrium that divides each player's behaviour into two phases: Phase S, where two newly randomly matched players (e.g., strangers) test each other and reveal their type; Phase F, where players collude after they both passed the testing phase. Behaviour in either phase is incentive compatible and will satisfy both the *Individual Incentive Constraint*, and *Bilateral Rationality*. To understand the properties of the equilibrium we imagine that it is in place, and denote V^s , V^F , the present discounted value of local players (mayors and contractors) respectively. We solve the model backward and consider, first, a pair of players that are in Phase F and wish to maximize collusion possibilities (bilateral rationality) by solving the following problem:

$$\max_{a \in A} \nu(a) \tag{7}$$

subject to the constraint,

$$\nu(a) \geq (1 - \delta)d(a) + \delta V^s \tag{8}$$

where constraint 8 is the individual incentive constraint. A deviation from collusion $\nu(a)$, delivers $d(a)$, and a future value V^s is the punishment if they split the collusive agreement. Bilateral rationality also applies to Phase S such that the level of collusion which two newly matched players would propose to each other maximizes the expected payoff of collusion of the local players in the following way:

$$\max_{a \in A, a \neq 0} \pi[(1 - \delta)\nu(a) + \delta V^F] + (1 - \pi)[(1 - \delta)l(a) + \delta V^S] \quad (9)$$

subject to the constraint,

$$\pi[(1 - \delta)\nu(a) + \delta V^F] + (1 - \pi)[(1 - \delta)l(a) + \delta V^S] \geq \pi(1 - \delta)d(a) + \delta V^S \quad (10)$$

Equation 9 represents the expected value of an agreement to play a for a patient player in Phase S, while equation 10 the incentive compatibility constraint. The equations capture the idea that strangers attempt to collude as much as they can, subject to the individual incentive constraints. With probability π the the agreement is sustained and players proceed to phase F in the next period. With probability $(1 - \pi)$ her parter is non-local (e.g., zero discount rate) and they return to phase S. The right hand side of the IC constraint represents the profits for a local player to deviate from a . She will enjoy with probability π a payoff $d(a)$ and then return to phase S. The left hand side is the expected present value of the agreement.

A social equilibrium is a collection of actions (a^S, a^F) ad payoffs (V^S, V^F) such that: a^F solves (7), subject to (8); a^S solves (9) subject to (10); V^F is the maximum value attained in (7); V^S is the maximum value attained in (9). Gosh and Ray (1996) show the existence of a social equilibrium and its properties. We apply their results on the equilibrium values of Phase S and F, time index the two Phases, and treat a as the intensity of collusion between local mayors and contractors to argue that in a social equilibrium $v(p_{t+1}) \geq v(p_t)$, hence $(p_{t+1} \geq p_t)$, Prediction 3.

References

- Albano, G.L., Bianchi, M., and G. Spagnolo, 2006. Bid Average Methods in Procurement. *Rivista di Politica Economica*, 1-2, 41-62.
- Arozamena, L., and F. Weinschelbaum, 2009. The Effect of Corruption on Bidding Behaviour in First-Price Auctions, *European Economic Review*, 53, 645-657.
- Audet, D., 2002. Government Procurement: A Synthesis Report. *OECD Journal on Budgeting*, 2, 149-194.
- Bajari, P. and S. Tadelis, 2001. Incentives Versus Transaction Costs: A Theory of Procurement Contracts. *The Rand Journal of Economics*, 32, 3, 287-307.
- Bajari, P., McMillan, R. and S. Tadelis, 2008. Auctions versus Negotiations in Procurement: An Empirical Analysis, *Journal of Law, Economics and Organization*, forthcoming.
- Bajari, P. and G. Lewis, 2009. Procurement contracting with Time Incentives: Theory and Evidence. NBER WP n. 14855.
- Bandiera, O., Prat, A., and T. Valletti, 2008. Active and Passive Waste in Government Spending: Evidence from a Policy Experiment. *American Economic Review*, 99, 4, 1278-1308.
- Besley, T. and A. Case, 1995. Does Political Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits. *Quarterly Journal of Economics*, 110, 769-98.
- Besley, T., Persson, T., and D. Sturm, 2007. Political Competition and Economic Performance: Theory and Evidence from the United States. Mimeo.
- Besley, T., and A. Prat, 2006. Handcuffs for the Grabbing Hand? The Role of the Media in Political Accountability. *American Economic Review*, 96, 720-736.
- Burguet, R., and Y.K. Che, 2004. Competitive Procurement with Corruption. *The RAND Journal of Economics*, 35, 50-68.
- Burguet, R., and M.K. Perry, 2009. Preferred Suppliers in Auction Markets. *The RAND Journal of Economics*, 40, 283-295.
- Campante, F., Chor, D., and Q. Do, 2008. Instability and the Incentives for Corruption. *Economics & Politics*, forthcoming.

- Card, D., and D. Lee, 2006. Regression Discontinuity Inference with Specification Error. NBER Technical WP n. 322.
- Cingano, F. and P. Pinotti, 2009. Politicians at Work, Mimeo.
- Compte, O., Lambert-Mogiliansky, A., and T. Verdier., 2005. Corruption and Competition in Procurement Auctions. The RAND Journal of Economics, 36, 1-15.
- Conconi, P., Facchini, G., and M. Zanardi, 2009. Policymakers' Horizons and Economic Reforms, Mimeo.
- Coviello, D., and M. Mariniello, 2008. Does Publicity Affect Competition? Evidence from Discontinuities in Public Procurement Auction, CSEF W.P. No. 189.
- Decarolis, F., 2008. When the Highest Bidder Loses the Auction: Theory and Evidence form Public Procurement. Mimeo.
- Dal Bó, E., and M. Rossi, 2008. Term Length and Political Performance. NBER WP n.14511.
- Dal Bó, P., and G., R., Frchette, 2009. The Evolution of Cooperation in Infinitely Repeated Games: Experimental Evidence. Mimeo.
- Di Tella, R., and E. Schargrotsky. 2003. The Role of Wages and Auditing during a Crackdown on Corruption in the City of Buenos Aires. Journal of Law and Economics, 46, 269-92.
- Dombrovsky, V., 2008. Political Connections and Firm Performance: The Latvian Way. Mimeo.
- Engel, E.M.R.A., Galetovic, A., and R. D. Fischer, 2006. Renegotiation Without Holdup: Anticipating Spending and Infrastructure Concessions. Yale University Economic Growth Center DPr No. 937.
- Faccio, M., 2006. Politically connected firms, American Economic Review, 96, 1, 369-386.
- Ferguson, T., and H.J. Voth, 2008. Betting on Hitler: The Value of Political Connections in Nazi Germany. Quarterly Journal of Economics, forthcoming.
- Ferraz, C., and F. Finan, 2008. Electoral Accountability and Corruption: Evidence from the Audits of Local Governments. Mimeo.
- Fisman, R., 2001. Estimating the Value of Political Connection. American Economic Review, 91, 4, 1095-1102.

- Garicano, L., I., Palacio-Huerta, and C., Prendergast, 2005. Favoritism Under Social Pressure. *The Review of Economics and Statistics*, 87, 208-216.
- Guasch, J.L., J.J. Laffont, and S. Straub, 2008. Renegotiation of Concession Contracts in Latin America, *International Journal of Industrial Organization*, forthcoming.
- Gamboa-Cavazos, M., Garza-Cantu, V., and C.E. Salinas, 2007. The Organization of Corruption: Political Horizons and Special Interests. Mimeo.
- Goldman, E., Rocholl, J., and J. So, 2008a. Political Connections and the Allocation of Procurement Contracts. Mimeo.
- Goldman, E., Rocholl, J., and J. So, 2008b. Do Politically Connected Boards Affect Firm Value?. *Review of Financial Studies*, forthcoming.
- Ghosh, P., and D. Ray, 1996. Cooperation in Community Interaction Without Information Flows. *Review of Economic Studies*, 63, 491-510.
- Graham, D.A., and R.C. Marshall, 1987. Collusive Bidder Behavior at Single-Object Second-Price and English Auctions. *The Journal of Political Economy*, 95, 1217-1239.
- Hyytinen, A., Lundberg, S., and O. Toivanen, 2007. Politics and procurement: Evidence from cleaning contracts. Mimeo.
- Imbens, G., and J. Angrist, 1994. Identification and Estimation of Local Average Treatment Effects, *Econometrica*, 62, 2, 467-476.
- Klemperer, P., 2002. What Really Matters in Practical Auction Design. *Journal of Economic Perspectives*, 16, 1, 169 -189.
- Laffont, J.J., and J. Tirole. 1991. Auction Design and Favoritism. *International Journal of Industrial Organization*, 9, 9-42.
- Lee, David S.. 2008. Randomized Experiments from Non-random Selection in the U.S. House Elections. *Journal of Econometrics*, 142, 675-697.
- Mattozzi, A., Merlo, A., 2007. Mediocracy. NBER Working Paper No. 12920.
- Mc Crary, J., 2008. Manipulation of the Running Variable in the Regression Discontinuity Design: A Density Test. *Journal of Econometrics* 142, 698–714.
- Menezes, F.M., and P.K. Monteiro, 2000. Auctions with Endogenous Participation. *Review of Economic Design*, 5, 71-89.

Mulligan, C.B., and K.K. Tsui, 2008. Political Entry, Public Policies, and the Economy. NBER WP No. 13830.

Padró i Miquel, G., and J. Snyder, 2006. Effectiveness and Legislative Careers. *Legislative Studies Quarterly*, 31, 347-381.

Polo, M., 1998. Electoral Competition and Political Rents. Mimeo.

Robinson, M.S., 1985. Collusion and the Choice of Auction. *The RAND Journal of Economics*, 16, 141-145.

Rose-Ackerman, S., 1999. *Corruption and Government: Causes, Consequences, and Reform*. New York: Cambridge University Press.

Sukhtankar, S., 2008. Sweetening the Deal? Political Connections and Sugar Mills in India. Mimeo.

Tables and Figures

Table 1: City characteristics

	Mean	St.Dev.	Min	p25	p50	p75	Max	N.
North-West	0.40	0.49	0	0	0	1	1	3,848
North-East	0.20	0.40	0	0	0	0	1	3,848
Center	0.14	0.35	0	0	0	0	1	3,848
South	0.22	0.42	0	0	0	0	1	3,848
Islands	0.04	0.19	0	0	0	0	1	3,848
Population	11,689	63,197	504	1,817	3,871	8467	2,733,908	3,848
Judicial efficiency	99.88	61.50	30.20	55.30	94.10	126.20	462.50	3,848

Population is the number of resident inhabitants as of 2000. *Judicial efficiency* is the ratio (times 100) between settled and incoming cases, for each regional administrative court (*TAR*), and for public works related disputes.

Table 2: Mayor/Term characteristics

	Mean	St.Dev.	Min	p25	p50	p75	Max	N.
Female	0.08	0.28	0	0	0	0	1	5,241
Age	49.88	9.14	25.42	43.41	49.70	55.87	83.10	5,241
Born in the province	0.84	0.36	0	1	1	1	1	5,241
Municipal experience (years)	7.42	5.36	0	3.99	7.96	12.52	20	5,241
Previous years in office (as mayor)	2.29	3.23	0	0	0	4.14	14.97	5,241
Previous terms in office (as mayor)	1.53	0.71	1	1	1	2	4	5,241
Term limit binding	0.39	0.49	0	0	0	1	1	5,241
<i>Education:</i>								
Lower secondary	0.10	0.30	0	0	0	0	1	5,112
Upper secondary	0.44	0.50	0	0	0	1	1	5,112
College	0.45	0.49	0	0	0	1	1	5,241
<i>Employment:</i>								
Not employed	0.12	0.31	0	0	0	0	1	5,241
Self-employed	0.43	0.49	0	0	0	1	1	5,009
Entrepreneur	0.33	0.47	0	0	0	1	1	5,009
Clerk	0.05	0.21	0	0	0	0	1	5,009
Blue collar	0.04	0.18	0	0	0	0	1	5,009
<i>Political party:</i>								
Center-right	0.10	0.30	0	0	0	0	1	5,241
Center-left	0.75	0.43	0	1	1	1	1	5,241
Others	0.10	0.27	0	0	0	0	1	5,241
<i>Coalition:</i>								
N. parties mayor's coalition	1.31	0.99	1	1	1	1	12	5,241
(%) seats mayor's coalition	67.78	7.52	60	66.67	66.67	66.67	100	5,241

Municipal experience in any office. *Previous years/terms in office (as mayor)* without interruption.

Table 3: Auction characteristics

	Mean	St.Dev.	Min	p25	p50	p75	Max	N.
<i>Outcome:</i>								
Number of bidders	21.43	21.15	1	5	14	32	100	27,189
Winning rebate (in %)	12.98	8.35	0	6.98	12.45	17.12	49.99	27,189
Winner in the province	0.51	0.50	0	0	1	1	1	26,870
Max adjudications per firm (in %)	0.24	0.25	0.02	0.08	0.15	0.33	1	27,184
Time renegotiation	0.52	0.50	0	0	1	1	1	10,762
Money renegotiation	0.79	0.41	0	1	1	1	1	10,665
<i>Selection mechanism:</i>								
Direct negotiation	0.09	0.29	0	0	0	0	1	27,189
<i>Characteristics of the good:</i>								
Starting value (100thousand euros)	5.41	9.39	1.34	2.03	2.94	5.16	190.83	27,189
Road	0.23	0.42	0	0	0	0	1	27,189
School	0.13	0.33	0	0	0	0	1	27,189
Building	0.05	0.22	0	0	0	0	1	27,189
Housing	0.01	0.11	0	0	0	0	1	27,189
Art	0.04	0.19	0	0	0	0	1	27,189
Others	0.54	0.50	0	0	1	1	1	27,189
<i>Year bid delivery:</i>								
2000	0.16	0.36	0	0	0	0	1	27,189
2001	0.20	0.40	0	0	0	0	1	27,189
2002	0.21	0.41	0	0	0	0	1	27,189
2003	0.20	0.40	0	0	0	0	1	27,189
2004	0.15	0.36	0	0	0	0	1	27,189
2005	0.09	0.29	0	0	0	0	1	27,189

Notes. Public tenders for works with starting value greater or equal to 150,000 euros (2000 equivalents). *Starting value* is the maximum potential price (i.e., the reserve price) paid by the contracting authority and is expressed in 100,000 euros (2000 equivalents) *Time renegotiation* and *Money renegotiation* only available for the regions of Piemonte, Valle d'Aosta, Lombardia. *Winner in the province* indicates whether the winning firm is registered in the province. *Max adjudications per firm (in %)* represents the highest percentage of public tenders assigned to the same firm within the term.

Table 4: Political longevity and the level of competition, OLS, full sample

	(1)	(2)	(3)	(4)	(5)	(6)
Mean outcome:	Panel A: N. Bidders= 21.43			Panel B: Winning Rebate=12.98 %		
Longevity (years)	-1.085*** (0.133)	-0.140* (0.076)		-0.385*** (0.060)	-0.075** (0.037)	
Longevity (terms)			-0.678* (0.362)			-0.398** (0.178)
Term limit binding	5.161*** (1.361)	1.253* (0.665)	1.346** (0.683)	0.295 (0.617)	0.100 (0.259)	0.189 (0.273)
Population		0.062*** (0.020)	0.062*** (0.020)		0.042*** (0.009)	0.042*** (0.009)
Starting value		0.681*** (0.073)	0.681*** (0.073)		0.082*** (0.012)	0.082*** (0.012)
Party longevity (years)		-0.131 (0.087)	-0.132 (0.087)		-0.082** (0.036)	-0.082** (0.036)
N. parties mayor's coalition		0.258 (0.159)	0.259 (0.159)		0.122** (0.055)	0.123** (0.055)
Seats (%) mayor's coalition		-0.194*** (0.029)	-0.194*** (0.029)		-0.088*** (0.013)	-0.088*** (0.013)
Female		-0.228 (0.687)	-0.224 (0.687)		0.024 (0.225)	0.026 (0.225)
Age of the mayor		0.006 (0.023)	0.006 (0.023)		0.011 (0.008)	0.011 (0.008)
Observations	27,189	27,189	27,189	27,189	27,189	27,189
R-squared	0.007	0.239	0.239	0.013	0.484	0.484
Province fixed-effects	no	yes	yes	no	yes	yes
Year dummies	no	yes	yes	no	yes	yes
City characteristics	no	yes	yes	no	yes	yes
Auction characteristics	no	yes	yes	no	yes	yes
Mayor characteristics	no	yes	yes	no	yes	yes
Electoral characteristics	no	yes	yes	no	yes	yes

Notes. Estimates on 5,241 mayors. Cities with a population larger than 500. Auctions held between 2000-2005, and with no more than 100 bidders. *N. bidders* is the number of firms that submitted a bid. *Winning Rebate* is expressed as a percentage discount from the the starting value. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum price (i.e., the reserve price) payed by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions additionally include *Province FE* (104 dummies); *Year dummies* (2000-2004); *City characteristics* (disposable income per capita in euros (2005 equivalents); judicial efficiency at year-region level; budget deficit in percentage of the revenues at year level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (3 education dummies, 3 previous occupation dummies, a dummy for being born in the province); *Electoral characteristics* (squared term of the time to next election, 3 political party dummies). Standard errors robust to clustering at the mayor level in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Table 5: Mayors' characteristics around the 1993 reform

	Elected after 1993	Elected before 1993	
	Mean	Mean	p-value diff.
Panel A: ± 4 years bandwidth			
Female	0.063	0.034	0.000
Age (years)	45.720	45.980	0.101
Born in the same city	0.581	0.640	0.000
Empl. high skilled	0.759	0.736	0.001
Edu. college	0.406	0.339	0.000
Previous terms in office (as mayor)	0.430	0.408	0.030
Probability of reelection	0.528	0.367	0.000
Budget deficit	-0.002	-0.016	0.600
Population	7,236	7,036	0.783
Judicial efficiency	142.492	141.440	0.338
Observations	8,189	6,865	
Panel B: ± 2 years bandwidth			
Female	0.060	0.059	0.938
Age (years)	44.873	44.921	0.934
Born in the same city	0.632	0.658	0.387
Empl. high skilled	0.812	0.804	0.743
Edu. college	0.524	0.515	0.773
Previous terms in office (as mayor)	0.204	0.191	0.616
Probability of reelection	0.485	0.424	0.007
Budget deficit	0.003	-0.016	0.000
Population	13,436	11,085	0.613
Judicial efficiency	142.514	141.848	0.889
Observations	2,287	304	
Panel C: ± 1 year bandwidth			
Female	0.064	0.060	0.821
Age (years)	44.855	44.392	0.517
Born in the same city	0.630	0.628	0.949
Empl. high skilled	0.818	0.821	0.926
Edu. college	0.509	0.563	0.152
Previous terms in office (as mayor)	0.228	0.191	0.255
Probability of reelection	0.479	0.460	0.459
Budget deficit	-0.011	-0.017	0.280
Population	13,560	13,709	0.982
Judicial efficiency	145.067	144.660	0.946
Observations	1,613	199	

Notes. *Population* is the resident population as reported in the 1991 Census. *Budget deficit* is the percentage budget deficit over total revenues. *Judicial efficiency* is the ratio (times 100) between settled and incoming cases, for each regional administrative court (*TAR*), and for public works related disputes.

Table 6: Political longevity and the level of competition, window sample

	(1)	(2)	(3)	(4)	(5)
<i>Dependent variable:</i>	Longevity	Number of bidders	Number of bidders	Winning Rebate	Winning Rebate
Method:	OLS	OLS	2SLS	OLS	2SLS
Stage:	First		Second		Second
Mean outcome:	2.284	22.76	22.76	12.78%	12.78%
Longevity (terms)		-8.666*** (2.589)	-8.747*** (2.649)	-1.028 (0.703)	-1.810** (0.774)
Before March 1993	0.923*** (0.029)				
Term limit binding	0.785*** (0.090)	1.312 (4.305)	1.317 (4.312)	-1.488 (1.084)	-1.444 (1.086)
Population	0.000* (0.000)	0.082** (0.041)	0.083** (0.041)	0.025*** (0.007)	0.026*** (0.007)
Starting value	-0.000 (0.000)	0.607*** (0.160)	0.607*** (0.160)	0.016 (0.031)	0.015 (0.031)
Party longevity (years)	-0.002 (0.003)	-0.350 (0.339)	-0.348 (0.340)	0.031 (0.116)	0.052 (0.115)
N. parties mayor's coalition	-0.002 (0.003)	-0.498 (0.853)	-0.502 (0.853)	0.592*** (0.224)	0.556** (0.227)
Seats (%) mayor's coalition	0.002** (0.001)	-0.283** (0.132)	-0.283** (0.132)	-0.130*** (0.039)	-0.123*** (0.039)
Female mayor	-0.007 (0.008)	0.602 (2.131)	0.603 (2.131)	-1.593** (0.715)	-1.582** (0.728)
Age of the mayor	0.001*** (0.000)	0.170* (0.101)	0.171* (0.101)	0.010 (0.028)	0.015 (0.028)
Observations	2,030	2,030	2,030	2,030	2,030
R-squared	0.982	0.343	0.343	0.538	0.538
F-exc.-Inst	997.7				
Province fixed-effects	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
City characteristics	yes	yes	yes	yes	yes
Auction characteristics	yes	yes	yes	yes	yes
Mayor characteristics	yes	yes	yes	yes	yes
Electoral characteristics	yes	yes	yes	yes	yes

Notes. Estimates computed on 408 mayors. Cities with a population larger than 500. Auctions held between 2000-2005, and with no more than 100 bidders. Only mayors at their third (*Treated*) or at their second (*Control*) terms, elected for the first time between March 27, 1990 and September 27, 1994, [-36,+18] months from the electoral reform. *Number of bidders* is the number of firms that submitted a bid. *Winning Rebate* is expressed as a percentage discount from the the starting value. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum potential price (i.e., the reserve price) paid by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions additionally include *Province FE* (104 dummies); *Year dummies* (2000-2004); *City characteristics* (disposable income per capita in euros (2005 equivalents); judicial efficiency at year-region level; budget deficit in percentage of the revenues at year level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (education dummies, 3 previous occupation dummies, a dummy for being born in the province); *Electoral characteristics* (squared term of the time to next election, 2 political party dummies). Standard errors robust to clustering at the mayor level in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Table 7: Political longevity and the nature of competition, window sample

	(1)	(2)	(3)	(4)
<i>Dependent variable:</i>	Winner in Province	Winner in Province	Max Victories	Max Victories
Method:	OLS	2SLS	OLS	2SLS
Mean outcome:	0.508	0.508	0.248	0.248
Longevity (terms)	0.135** (0.062)	0.135** (0.064)	0.098* (0.053)	0.116** (0.055)
Term limit binding	0.066 (0.094)	0.066 (0.094)	0.054 (0.258)	0.055 (0.257)
Population	0.001*** (0.000)	0.001*** (0.000)	-0.009*** (0.003)	-0.009*** (0.003)
Starting value	-0.006*** (0.002)	-0.006*** (0.002)	0.000 (0.001)	0.000 (0.001)
Party longevity (years)	-0.003 (0.008)	-0.003 (0.008)	0.023*** (0.008)	0.023*** (0.008)
N. parties mayor's coalition	-0.037** (0.015)	-0.037** (0.015)	-0.014 (0.016)	-0.013 (0.015)
Seats (%) mayor's coalition	0.003 (0.003)	0.003 (0.003)	0.010*** (0.003)	0.009*** (0.004)
Female mayor	0.072 (0.049)	0.072 (0.049)	-0.029 (0.067)	-0.030 (0.068)
Age of the mayor	0.003 (0.002)	0.003 (0.002)	0.001 (0.002)	0.001 (0.002)
Observations	2,030	2,030	1,177	1,177
R-squared	0.158	0.158	0.619	0.618
Province fixed-effects	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
City characteristics	yes	yes	yes	yes
Auction characteristics	yes	yes	yes	yes
Mayor characteristics	yes	yes	yes	yes
Electoral characteristics	yes	yes	yes	yes

Notes. Estimates computed on 408 (229 for the Max Victories) mayors. Cities with a population larger than 500. Auctions held between 2000-2005, and with no more than 100 bidders. Only mayors at their third (*Treated*) or at their second (*Control*) terms, elected for the first time between March 27, 1990 and September 27, 1994, [-36,+18] months from the electoral reform. *Winner in Province* indicates whether the winning firm is registered in the province. *Max Victories* is the highest percentage of public tenders assigned to the same firm within the term. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum potential price (i.e., the reserve price) payed by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions additionally include *Province FE* (104 dummies); *Year dummies* (2000-2004); *City characteristics* (disposable income per capita in euros (2005 equivalents); budget deficit in percentage of the revenues at year-city level; judicial efficiency at year-region level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (3 education dummies, 3 previous occupation dummies, a dummy for being born in the province); *Electoral characteristics* (squared term of the time to next election, 2 political party dummies). Standard errors robust to clustering at the mayor level in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Table 8: Political longevity and the level/nature of competition, fuzzy-RDD, full sample

	(1)	(2)	(3)	(4)	(5)
<i>Dependent variable:</i>	Longevity	Number of bidders	Winning Rebate	Winner in Province	Max Victories
Method:	OLS	f-RDD	f-RDD	f-RDD	f-RDD
Stage:	First	Second	Second	Second	Second
Mean outcome:	1.477	21.76	13.00 %	0.491	0.23
Longevity (terms)		-1.685*** (0.265)	-0.728*** (0.113)	0.026*** (0.003)	0.017 (0.011)
Before March 1993	1.972*** (0.014)				
Term limit binding	0.941*** (0.034)	1.857*** (0.711)	-0.502*** (0.171)	-0.000 (0.036)	-0.037 (0.058)
Population	0.000 (0.000)	0.056*** (0.021)	0.043*** (0.013)	0.001*** (0.000)	-0.000 (0.000)
Starting value	0.000 (0.000)	0.675*** (0.056)	0.081*** (0.017)	-0.011*** (0.001)	-0.001*** (0.000)
Party longevity (years)	0.001 (0.001)	-0.155*** (0.043)	-0.101*** (0.031)	0.004*** (0.001)	0.006*** (0.001)
N. parties mayor's coalition	0.002 (0.001)	0.203*** (0.074)	0.078 (0.093)	0.010*** (0.003)	-0.009* (0.005)
Seats (%) mayor's coalition	0.001 (0.001)	-0.350*** (0.076)	-0.164*** (0.024)	0.002 (0.001)	0.014*** (0.003)
Female mayor	-0.005 (0.003)	-0.677 (0.507)	-0.069 (0.249)	0.014 (0.016)	-0.013*** (0.004)
Age of the mayor	-0.000 (0.000)	0.005 (0.031)	0.008 (0.010)	-0.000 (0.000)	0.000 (0.000)
Observations	23,573	23,573	23,573	23,573	21,212
R-squared	0.993	0.224	0.495	0.093	0.389
F-exc.-Inst	18,726				
Distance function	yes	yes	yes	yes	yes
Province fixed-effects	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
City characteristics	yes	yes	yes	yes	yes
Auction characteristics	yes	yes	yes	yes	yes
Mayor characteristics	yes	yes	yes	yes	yes
Electoral characteristics	yes	yes	yes	yes	yes

Notes. Notes. Estimates computed on on 4,123 (3,728 for the Max Victories) mayors. Cities with a population larger than 500. Auctions held between 2000-2005, and with no more than 100 bidders. All the mayors elected for the first time between April 27, 1985 and June 27, 2006, [-95,+147] months from the electoral reform. *Number of bidders* is the number of firms that submitted a bid. *Winning Rebate* is expressed as a percentage discount form the the starting value. *Winner in Province* indicates whether the winning firm is registered in the province. *Max Victories* is the highest percentage of public tenders assigned to the same firm within the term. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum potential price (i.e., the reserve price) paid by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions include a *Distance function* (6 biannual dummies); *Province FE* (104 dummies); *Year dummies* (2000-2004); *City characteristics* (judicial efficiency at year-region level; budget deficit in percentage of the revenues at year level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (3 education dummies, 3 previous occupation dummies, a dummy for being born in the city); *Electoral characteristics* (squared term of the time to next election, 2 political party dummies). Standard errors robust to clustering at the mayor level in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Table 9: Political longevity and renegotiations, fuzzy-RDD, full sample

	(1)	(2)	(3)	(4)
<i>Dependent variable:</i>	Money	Money	Time	Time
	renegotiations	renegotiations	renegotiations	renegotiations
Method:	OLS	f-RDD	OLS	f-RDD
Mean outcome:	0.823	0.823	0.553	0.553
Longevity (terms)	0.027 (0.020)	0.152* (0.091)	0.005 (0.016)	0.106* (0.055)
Term limit binding	-0.045* (0.026)	-0.158** (0.079)	0.062* (0.035)	-0.029 (0.058)
Population	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Deficit	0.007*** (0.002)	0.007*** (0.002)	0.026*** (0.006)	0.026*** (0.006)
Starting value	0.002 (0.001)	0.001 (0.001)	0.000 (0.002)	0.000 (0.002)
Party longevity (years)	-0.004 (0.003)	-0.006* (0.003)	-0.003 (0.003)	-0.004 (0.003)
N. parties mayor's coalition	-0.004 (0.003)	-0.005 (0.004)	-0.011*** (0.003)	-0.012*** (0.003)
Seats (%) in mayor's coalition	-0.002** (0.001)	-0.002** (0.001)	-0.001 (0.001)	-0.001 (0.001)
Female mayor	-0.042*** (0.016)	-0.042*** (0.015)	-0.035 (0.028)	-0.035 (0.028)
Age of the mayor	0.001 (0.001)	0.001 (0.001)	0.002* (0.001)	0.002* (0.001)
Observations	2,445	2,445	2,445	2,445
R-squared	0.473	0.470	0.132	0.131
Distance function	yes	yes	yes	yes
Region fixed-effects	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
City characteristics	yes	yes	yes	yes
Auction characteristics	yes	yes	yes	yes
Mayor characteristics	yes	yes	yes	yes
Electoral characteristics	yes	yes	yes	yes

Notes. Estimates computed on 632 mayors. Cities with a population larger than 500. Auctions held between 2000-2002, and with no more than 100 bidders. All the mayors elected for the first time between April 27, 1985 and June 27, 2006, [-95,+147] months from the electoral reform. *Money renegotiation* indicates whether the final price of the auction has been *ex-post* renegotiated in favor of the winner. *Time renegotiation* indicates whether the deadline for the submission of the works has been extended. Outcomes available for the regions of Piedmont, Trentino Alto Adige, Lombardy. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum potential price (i.e., the reserve price) paid by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions include a *Distance function* (third order polynomial in the distance from the reform); *Region FE* (2 dummies); *Year dummies* (2000-2002); *City characteristics* (judicial efficiency at year-region level; budget deficit in percentage of the revenues at year level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (gender, age, 3 education dummies, 3 previous occupation dummies, a dummy for being born in the city); *Electoral characteristics* (number of parties in the mayor's coalition, 2 political party dummies). Standard errors robust to clustering at the mayor level in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Table 10: Robustness check A: Term limit endogenous, full sample

	(1)	(2)	(3)	(4)
<i>Dependent variable</i>	Number of bidders	Winning Rebate	Winner in Province	Max Victories
Method:	f-RDD	f-RDD	f-RDD	f-RDD
Mean Outcome:	21.76	13.00%	0.491	0.230
Longevity (terms)	-1.474*** (0.366)	-0.756*** (0.103)	0.026*** (0.003)	0.012 (0.008)
Term limit binding	3.786 (4.016)	-1.832*** (0.641)	0.001 (0.035)	-0.036 (0.063)
Population	0.055** (0.022)	0.042*** (0.012)	0.001*** (0.000)	-0.000 (0.000)
Starting value	0.674*** (0.053)	0.079*** (0.017)	-0.011*** (0.001)	-0.001*** (0.000)
Party longevity (years)	-0.129*** (0.033)	-0.087*** (0.029)	0.004*** (0.001)	0.005*** (0.001)
N. parties mayor's coalition	0.133* (0.069)	0.048 (0.089)	0.011*** (0.003)	-0.002 (0.005)
Seats (%) mayor's coalition	-0.559*** (0.119)	-0.235*** (0.029)	0.003 (0.002)	0.026*** (0.003)
Female mayor	-0.521 (0.613)	-0.066 (0.274)	0.013 (0.017)	-0.018** (0.007)
Age of the mayor	-0.000 (0.033)	0.006 (0.011)	-0.000 (0.000)	0.000 (0.000)
Observations	23,573	23,573	23,573	21,212
R-squared	0.226	0.498	0.093	0.417
Distance function	yes	yes	yes	yes
Margin of victory	yes	yes	yes	yes
Province fixed-effects	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
City characteristics	yes	yes	yes	yes
Auction characteristics	yes	yes	yes	yes
Mayor characteristics	yes	yes	yes	yes
Electoral characteristics	yes	yes	yes	yes

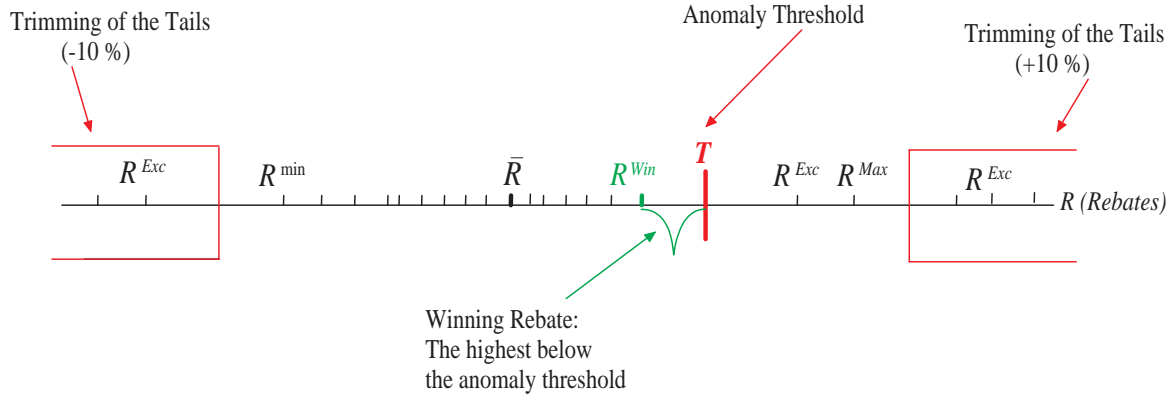
Notes. Estimates computed on 4,123 (3,728 for the Max Victories) mayors. Cities with a population larger than 500. Auctions held between 2000-2005, and with no more than 100 bidders. All the mayors elected for the first time between April 27, 1985 and June 27, 2006, [-95,+147] months from the electoral reform. *Number of bidders* is the number of firms that submitted a bid. *Winning Rebate* is expressed as a percentage discount from the starting value. *Winner in Province* indicates whether the winning firm is registered in the province. *Max Victories* is the highest percentage of public tenders assigned to the same firm within the term. Columns (1)-(4) include a cubic spline function of the margin of victory and the term limit. *Margin of victory* is defined as the vote share between the incumbent mayor and the runner-up candidate. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum potential price (i.e., the reserve price) paid by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions include a *Distance function* (6 biannual dummies); *Province FE* (104 dummies); *Year dummies* (2000-2004); *City characteristics* (judicial efficiency at year-region level; budget deficit in percentage of the revenues at year level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (3 education dummies, 3 previous occupation dummies, a dummy for being born in the city); *Electoral characteristics* (squared term of the time to next election, 2 political party dummies). Standard errors robust to clustering at the mayor level in parentheses. Significance at the 10% level is represented by *, at the 5% level by **, and at the 1% level by ***.

Table 11: Robustness check B: Heckman's sample selection, window sample

	(1)	(2)	(3)	(4)
<i>Dependent variable:</i>	Number of bidders	Winning Rebate	Winner in Province	Max Victories
Method:	OLS	OLS	OLS	OLS
Mean Outcome:	22.23	12.54%	0. 506	0.306
Longevity (terms)	-7.306*** (2.791)	-0.465 (0.816)	0.128* (0.065)	0.144** (0.068)
Term limit binding	-0.129 (4.795)	-1.311 (1.137)	0.091 (0.093)	-0.098 (0.237)
Population pop_res	0.090** (0.042)	0.024*** (0.007)	0.002*** (0.000)	-0.011*** (0.004)
Starting value	0.633*** (0.156)	0.023 (0.031)	-0.006*** (0.002)	0.001 (0.002)
Party longevity (years)	-0.341 (0.339)	0.039 (0.122)	-0.001 (0.008)	0.015 (0.010)
N. parties mayor's coalition	-0.846 (0.823)	0.559** (0.222)	-0.032* (0.016)	-0.015 (0.019)
Seats (%) mayor's coalition	-0.334** (0.135)	-0.127*** (0.043)	0.004 (0.004)	0.007* (0.004)
Female mayor	1.437 (2.166)	-1.465* (0.761)	0.047 (0.053)	-0.055 (0.071)
Age of the mayor	0.137 (0.098)	-0.001 (0.029)	0.001 (0.002)	0.001 (0.002)
Inverse of Mills' Ratio	-0.913 (1.202)	-0.558 (0.456)	0.039 (0.034)	0.060*** (0.018)
Observations	2,030	2,030	2,030	1,177
R-squared	0.351	0.547	0.167	0.645
Province fixed-effects	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
City characteristics	yes	yes	yes	yes
Auction characteristics	yes	yes	yes	yes
Mayor characteristics	yes	yes	yes	yes
Electoral characteristics	yes	yes	yes	yes

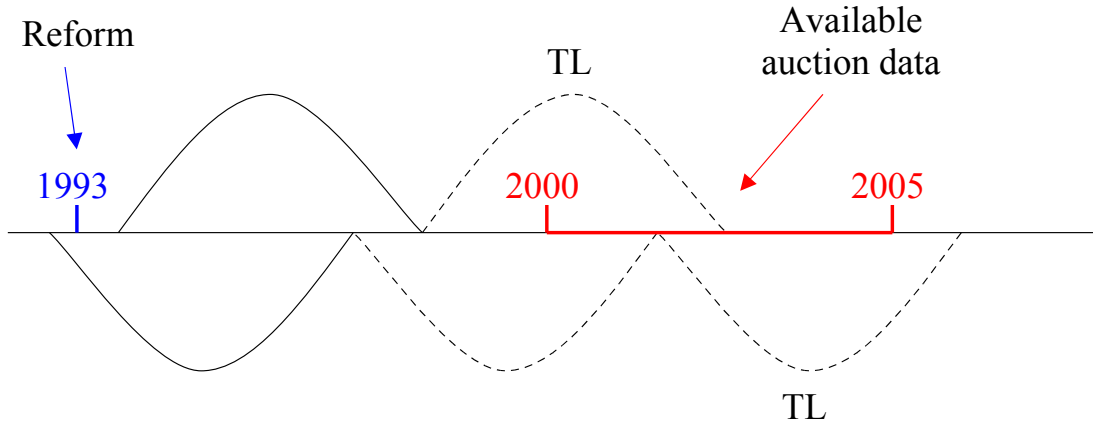
Notes. Estimates computed on 408 mayors. Cities with a population larger than 500. Auctions held between 2000-2005, and with no more than 100 bidders. Only mayors at their third (*Treated*) or at their second (*Control*) terms, elected for the first time between March, 27, 1990 and September, 27, 1994, [-36,+18] months from the electoral reform. *Number of bidders* is the number of firms that submitted a bid. *Winning Rebate* is expressed as a percentage discount from the the starting value. *Winner in Province* indicates whether the winning firm is registered in the province. *Max Victories* is the highest percentage of public tenders assigned to the same firm within the term. Columns (1)-(4) are the second step OLS estimates of the Heckmans' sample selection model. The inverse of the Mill's ratio ($\frac{\phi(.)}{\Phi(.)}$) estimated with a probit model in the first step, and using as exclusion restriction the 1993 reform indicator. *Term limit binding* is an indicator of whether the mayor is in her last term in office. *Population* is the resident population as of 2000, in 10 thousands. *Starting value* is the maximum potential price (i.e., the reserve price) payed by the contracting authority and is expressed in 100,000 euros (2000 equivalents). *Party Longevity* is the longevity of the party of the mayor in years. *N. parties mayors' coalition* is the number of parties that constitute the coalition of the mayor. *Seats (%) mayor's coalition* represents the number of seats (in %) belonging to the mayoral coalition. When denoted with "yes", regressions additionally include *Province FE* (104 dummies); *Year dummies* (2000-2004); *City characteristics* (judicial efficiency at year-region level; budget deficit in percentage of the revenues at year level); *Auction characteristics* (squared term of the starting value, 5 object characteristics dummies, 1 selection mechanism dummy); *Mayor characteristics* (3 education dummies, 3 previous occupation dummies, a dummy for being born in the city); *Electoral characteristics* (squared term of the time to next election, 2 political party dummies). Standard errors robust to clustering at the mayor level in pa

Figure 1: The awarding mechanism



Notes. T , is the anomaly threshold obtained as the sum of \bar{R} and the average deviation of the bids above \bar{R} . R^{Win} is the winning rebate that minimizes the distance from below to T , expressed as a percentage reduction from the starting value. \bar{R} is the average rebate.

Figure 2: The electoral reform



Notes. *TL* stands for the term limit binding. Dash lines for potential following terms.

Figure 3: Political turnover and public procurement auctions



Notes. All variables averaged over the cities, by year within the term. *Total n. acutions per year* is the total number of auctions. *Starting value per auctions* is the reserve price of the auction expressed in 100 thousand euros (2000 equivalents). *Number of bidders per auction* is the number of bidding firms per auction. *Winning rebate (%) per auction* is the winning rebate expressed as a percentage discount from the starting value.

Figure 4: Election timing

