

All for One and One for All!
How Do Corruption Investigations Affect
Municipalities' Public Procurement Choices?

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Abstract

Using data on public procurement, we assess the impact of opening a public investigation into French municipalities' choice of award procedures. We observe that municipalities that are suspected of being corrupt do not change their practices. We argue that such municipalities have no interest in change as long as the investigation is pending. Conversely, our results indicate that neighboring municipalities do adapt their award procedures to reduce the probability of being identified as corrupt. We conclude that even if investigations rarely lead to convictions, they are nevertheless more efficient than might appear at first glance through their positive externalities in the form of disciplining potentially corrupt neighboring municipalities.

JEL codes: D73, H50, H42.

1 Introduction

Public procurement is a fertile ground for corruption: the OECD Foreign Bribery Report (2014)¹ shows that 57% of corruption cases are related to public procurement. As public procurement represents between 15 and 25% of GDP in OECD countries, the stakes in fighting corruption are high.² Due to its hidden nature, it is difficult to evaluate the exact cost of graft. A 2014 study by PricewaterhouseCoopers (PwC) for the European Union (EU) estimates that bid rigging in public procurement affects 48% of auctions.³ In addition, the quality of public services depends on good practices in public procurement: the greater the extent of corruption is, the more expensive and less efficient the public services (Djankov et al. [2017]).

Public demand for goods and services is typically procured through various award procedures that give public authorities more or less discretionary power depending on whether a negotiation phase is included. The choice of the award mechanism is usually guided by the trade-off between giving discretion to the buyer when using negotiated procedures and promoting transparency and competition through auctions. Accordingly, Bulow and Klemperer [1996] claim that the benefit from one additional bidder participating in auctions yields higher expected revenues than the extra value generated from negotiation, while Goldberg [1977] emphasizes the merits of negotia-

¹Report available at:
<http://www.oecd.org/corruption/oecd-foreign-bribery-report-9789264226616-en.htm>

²OECD statistics, available at: <http://stats.oecd.org/>

³PwC (2014), Public Procurement: costs we pay for corruption

tions when accounting for the contractual complexity. The researcher suggests that as “the complexity of the transaction increases, the relative significance of the price term will decrease”. For the procurement of complex goods and services, the early exchange of information is important for avoiding costly renegotiation. If the buyer can specify the primary characteristics of possible design improvements in a complete contingent contract, then scoring auctions implement the efficient allocation. However, if this is not feasible, the buyer must choose between a price-only auction (discouraging early information exchange) and bilateral negotiations with preselected sellers, reducing competition. Indeed, negotiation introduces discretion that allows the parties to evaluate more carefully the aspects other than price ([Bajari and Tadelis \[2001\]](#), [Herweg and Schmidt \[2017\]](#)) and does not always lead to lower quality or greater favoritism ([Chever et al. \[2017\]](#), [Coviello et al. \[2018\]](#)).

To win more procurement contracts and reduce the pressure of competing on price, firms may implement strategies to differentiate their offers and create social value. In particular, [Flammer \[2018\]](#) shows that a higher degree of corporate social responsibility significantly impacts a firm’s likelihood of winning procurement contracts. This is greatly encouraged by negotiation in award procedures. However, some firms may implement strategies that are detrimental to society. In particular, bribing an official responsible for public procurement could be one such strategy. In this scenario, discretion can be detrimentally abused by the buyer to distort competition, as it creates room for manipulation and favoritism. Therefore, the efficiency of negotiated

procedures could be jeopardized by potential corruption.

Courts of law audit public procurement practices and sanction corruption. However, few cases are effectively investigated, and few sanctions are applied (some bad practices might also be the result of the incompetence of public authorities ([Estache and Foucart \[2018\]](#))).

In this paper, we focus on one dimension of corruption, namely, favoritism. By manipulating *ex-ante* a call for tenders, public authorities can favor one specific candidate. The objective of the paper is to assess the impact of suspicion of corruption (i.e., the opening of a public investigation by courts of law) on procurement award mechanisms in municipalities. Specifically, we compare the types of award procedures before and after a suspicion is publicly raised. Corruption is more likely when a public authority uses an award procedure that restricts competition and creates room for discretion. We want to assess whether municipalities tend to use more open and transparent procedures once under suspicion to raise competition (i.e., the number of bidders) and reduce localism (i.e., the choice of a private partner within the municipality).

We use an original dataset for public procurement in France from 2006 to 2015. We identified municipalities suspected of favoritism, as well as judiciary outcomes. We ultimately consider 94 cases, of which 53 were prosecuted between 2005 and 2016. Using the differences-in-difference empirical strategy, we observe that an allegedly corrupt municipality will not significantly tend to use more transparent and open

procedures once under suspicion. However, we observe that neighboring municipalities will use more transparent calls for tenders to dismiss any suspicions when under a local spotlight on corruption. We argue that corruption suspicions do not change suspected municipalities' behavior because the cost of corruption is, on the one hand, the political cost associated with being under suspicion and, on the other hand, the penalty in the case of a conviction. Once identified as being potentially corrupt, it is not rational for a municipality to react, as it already bears the political cost of being under suspicion. However, this is not the case for municipalities located near suspected ones. To reduce their probability of being suspected, nearby municipalities will adapt and change their behavior. One interesting conclusion is that even if investigations rarely lead to convictions, they are nevertheless more efficient than might be thought at first glance through their positive externalities in the form of disciplining potentially corrupt neighboring municipalities.

We believe our paper contributes to the literature on corruption and public procurement. Due to the hidden dimension of corruption in public procurement, there are few papers devoted to this topic. Various aspects of corruption in public procurement have been considered, but as far as we know, this is the first paper to study the impact of corruption suspicions on the suspected municipalities. The closest work to ours seems to be that of [Tran \[2011\]](#). Using internal records from a bribe-paying firm, the researcher was able to identify the procurement procedure more likely to be subject to corruption. Our approach is quite different, as our objective is to assess

whether suspicion of corruption changes the way local authorities award a contract and to what extent this mechanism could be inefficient.

The rest of this paper is organized as follows. In section 2, we review the literature on the choice between open and negotiated award procedures and their links with discretion and favoritism. Section 3 provides a simple framework for the cost of corruption for municipalities. Propositions are provided concerning the impact of being suspected of being corrupt on municipalities' behavior. Section 4 provides an overview of the institutional framework, as well as the data and the sample selection we use. Subsequently, our empirical strategy and results are presented in sections 5 and 6. Robustness checks are proposed in section 7. Finally, we conclude this paper in section 8.

2 Award Procedures, Discretion and Favoritism

The goods needed by the public are procured using several award procedures. Some procedures are rigid, reducing the discretionary power of public authorities in their choice of contractors. Others are more flexible, introducing more discretionary power for the public authority to select the preferred contractors and reducing competition. Such discretionary power might be introduced through award mechanisms that are based on negotiations instead of pure auctions ([Bajari and Tadelis \[2001\]](#), [Bajari et al. \[2009\]](#), [Herweg and Schmidt \[2017\]](#)), through the use of imprecise criteria ([Burguet](#)

and Che [2004]) or through restricted auctions (Chever et al. [2017], Coviello et al. [2018]).

The economic literature suggests that buyers might deliberately choose to engage in award procedures that create room for public authorities' discretionary power for efficiency reasons. The primary reason for introducing negotiation is that award procedures based on auctions without any negotiation may lead to inefficient outcomes if the good or service to be procured is technically complex and/or barely contractible (see, e.g., Goldberg [1977], Levin and Smith [1994], Kim [1998], Bajari and Tadelis [2001], Bajari et al. [2009]). Negotiation either facilitates the dialogue between the parties, thereby reducing contractual incompleteness (Tadelis [2012], Bajari et al. [2014]), or eases the implementation of relational contracts (Kim [1998], Calzolari and Spagnolo [2009]). In such cases, auctions without any negotiation prove to be inefficient due to the inability of the buyer to specify the contract. Several empirical studies confirmed that negotiation can be attractive when ex-ante information from contractors is needed to make the contractual design as complete as possible (Bajari et al. [2014], Bajari et al. [2009], Decarolis [2014]).

However, the economic literature also suggests that discretion associated with negotiation may be detrimentally used to favor a bidder during the award phase (Moore and Staropoli [2018]). The seminal paper of (Burguet and Che [2004]) illustrates manipulation power using scoring rules auctions, where the contracting authority may

manipulate one dimension of qualitative criteria to favor one participant in the auction. The theory argues in favor of such a scoring rule, as it gives the buyer a larger set of choices between price and quality, potentially increasing the number of bidders, and makes collusion less sustainable. However, the researchers show that with a high degree of manipulation power, corruption softens price competition and results in higher procurement costs. These findings were empirically confirmed by [Tran \[2011\]](#), who obtained access to internal records of a bribe-paying firm in Indochina. The author analyzes the impact of scoring and price-only auctions on corruption by taking advantage of two successive changes in the policy on award mechanisms. Whereas scoring auctions were found to increase the bribes and profits of bribe-paying firms, the implementation of price-only auctions reduced both the amount of bribes and profits of those paying bribes. In addition, in a paper using data on almost 34,000 firms from the World Bank's Enterprise Surveys in 88 countries, [Knack et al. \[2017\]](#) found that in countries with more transparent procurement systems, where exceptions to open competition in tendering must be explicitly justified, firms report paying fewer and smaller kickbacks to officials.

3 The cost of corruption

The extent to which public authorities might abuse their discretionary power to follow a private agenda disconnected from public procurement efficiency reasons is related

to the probability of being prosecuted and that of being effectively convicted. The cost of being prosecuted is primarily a political cost: being suspected of corruption influences the probability of being reelected as mayor (if voters punish the suspects' unlawful behavior [Coviello and Gagliarducci \[2017\]](#)) and increases the level of scrutiny over the suspect's actions, reducing his or her discretionary power and increasing the probability of being challenged by third parties ([Spiller \[2008\]](#)). The cost of a conviction is the possibility of the municipality involved in a corruption case being fined and the mayor and involved civil servants going to jail. This cost is linked to past and ongoing behaviors during the investigation period. Hence, we can distinguish two periods (see [Table 1](#) for an example).

The cost of corruption for a municipality a serving in a city where there is no suspicion of corruption is given by NSa :

$$NSa = P_a(\text{Detected}) * \text{Political Costs} + P_a(\text{Convicted}) * \text{Conviction Costs}$$

As soon as the municipality is under suspicion, the political costs are borne by the municipality, regardless of the result of the investigation, which usually spans a long period.⁴ The cost of corruption for a municipality a serving in a city where there is suspicion of corruption is given by Sa :

$$Sa = \text{Political Costs} + P_a(\text{Convicted}) * \text{Conviction Costs}$$

This leads us to the following straightforward propositions:

⁴In our dataset, the average duration of prosecutions is five years.

Proposition 1: A municipality suspected of favoritism will not use more transparent and open award procedures during an investigation.

Behaviors that facilitate corruption have to be hidden, given the cost incurred upon being detected. As soon as one public authority is suspected of being corrupt, the probability of being effectively convicted is independent of its adaptation. Adaptation might even be perceived as an element of proof that a certain aspect of contract award procedures was improper. The best strategy is to continue as before, arguing that the existing approach is the right way of awarding public procurement contracts and waiting for the investigation results.

However, if there is no advantage in changing the way contracts are awarded, then there is an incentive to reduce corrupt practices (i.e., to open to competition and reduce favoritism) to be able to argue that flexible procedures are efficient and to reduce the cost of a conviction, if any.

Proposition 2: A municipality suspected of favoritism will reduce corrupt practices by increasing competition during award procedures and by reducing favoritism.

What can be expected for municipalities located near municipality a ? The cost of corruption for a municipality b serving a city where there is no suspicion of corruption is given by NS_b :

$$NS_b = P_b(\text{Detected}) * \text{Political Costs} + P_b(\text{Convicted}) * \text{Conviction Costs}$$

If the probability of a corrupt municipality b being detected is independent of the probability of a neighboring corrupt municipality a being detected, then, naturally, the cost of corruption is the same for both municipalities. However, one can expect that the scrutiny over the actions of municipalities located near the suspected ones is increased (i.e., the third parties' suspicion is increased).⁵ This means that $P_b(Detected|a=1)$ is not equal to $P_b(Detected|a=0)$ for neighboring municipalities. The fact that a municipality is suspected of corruption increases the probability of neighboring municipalities being detected, leading them to adapt their behavior.

Proposition 3: Municipalities will use more transparent calls for tenders to dismiss any suspicions when a neighboring municipality is under the spotlight on corruption.

This third proposition highlights the fact that municipalities' bad behaviors generate externalities for their neighborhoods. We expect that, to avoid being suspected of favoritism as well, municipalities located in the neighborhood of a suspected one will adapt by using more transparent and open award procedures to reduce the probability of being detected or even suspected of favoritism. To avoid any suspicion, municipalities will tend to use open auctions instead of negotiated award procedures.

⁵Very often, when a private company is engaged in corrupt practices with one municipality, it also tries to engage in such practices with other municipalities located in its business area. This is why a corrupt municipality in the north of France should not worry about investigations in the south but should be significantly worried about investigations in its vicinity. See, e.g., <https://www.nouvelobs.com/justice/20170118.OBS3990/plusieurs-maires-d-ile-de-france-corrompus-par-un-promoteur-immobilier.html>

4 Data

4.1 The institutional context

The French law on public procurement is primarily based on the European procurement directive. As our procurement data are for the period from 2006 to 2015, our institutional framework is based on the EU Directive 2004/18 of March 31, 2004, as well as on the 2006 French Code for public procurement.⁶ Three fundamental principles, namely, equal treatment, non-discrimination and transparency, guide public procurement. To ensure that these principles are respected in all EU countries, the European Commission (EC) sets value thresholds above which public authorities have to use open auctions without negotiations to award contracts (see Table 2). The use of negotiated procedures is not allowed, except in certain specific cases set by the EC.

For every contract below this threshold, national laws apply while still respecting the pillar principles set by the EU. In France, public authorities may in this case use what is called an adapted procedure (*procedure adaptee*). The specific feature of this procedure lies in the free choice of advertising⁷ and competitive process. In this case, contracts may be awarded through negotiation. This is a less stringent procedure, implemented to reduce transaction costs. On average, adapted procedures represent

⁶We are not concerned with the new European Directives on Public Procurement voted on in 2014 (2014/24/UE and 2014/25/UE) and adopted into French law in 2016.

⁷For tenders below the threshold but above the value of 90,000€, the adapted procedure may still be applied, but advertising should comply with the official rules, whereby authorities are asked to publish the tender in a legal journal.

approximately 70% of calls for tenders in France between 2006 and 2015 (see Table 3). Finally, it is noteworthy that, under the formal thresholds, the authority is not compelled to use an adapted procedure. It has the possibility of using a formal one. Ultimately, under the European thresholds, French municipalities might decide to use a very flexible award procedure (the adapted procedure) or a rigid one (an open auction).

4.2 Award notices

This paper is based on two datasets. The first is a collection of information about public procurement contracts of French municipalities from 2006 to 2015.⁸ It includes every call for tenders in France (i.e., approximately 80K observations per year). We were able to collect award notices only for a sub-sample of contracts (i.e., for approximately 14K observations per year). The range of goods and services municipalities deal with is very broad, as is the range of contract values, giving us a final sample of 64,304 observations, where each represents a contract (see Table 4).⁹

⁸We thank InfoPro Digital for producing and gracefully offering us these data.

⁹Examining the sample distribution by product type (e.g., Public works, Services and Supplies) and by type of award mechanism (see Tables 5 and 6), we observe that in our sample, certain product types and mechanisms are overrepresented because the data collection focused on high value contracts.

4.2.1 Contracts

To account for the award mechanism, we created a dummy variable *formal procedure* that takes the value of one if a municipality decided to award a contract i through a formal procedure.

In addition to the information regarding the award procedure, we also have access to the object that is tendered; we categorized it at a broad level (supplies, services, and public works contracts) and at a finer level, as we have the associated Common Procurement Vocabulary (CPV) code.¹⁰ As in Bajari and Tadelis [2001], the complexity of the contract is approximated by two variables, namely, *Value* and *Number of divisions*. The former corresponds to the project value, while the latter is the number of divisions of the contract. Usually, more complex projects are associated with higher values. Additionally, the higher the degree of divisions is, the more complex the project should be. We also control for the number of participants in the tender, *Average number of bidders* _{$t-1$} . As participation is known *ex-post*, we use the calculated average number of bidders participating in a tender during the previous year in the same county and in the same category of projects. We created the variable *Deadline* equal to the number of days between the date of submitting an offer and the publication date of the call for tenders. The more remote the deadline is, the easier it is for a competitor to submit a bid, and the higher the competition should be.

¹⁰The CPV code establishes a single classification system for public procurement at the European level. Information is available at <https://simap.ted.europa.eu/web/simap/cpv>

4.2.2 Contracting authorities

We also have access to detailed information about the identities of contracting authorities. An authority's location is known accurately, as we have its address and postal code. We use this information to create a variable *Neighbor* that takes the value of one if a municipality is in the neighborhood of a suspected one (we defined the neighborhood as a range of 30 miles).

We also control for the heterogeneity of municipalities using two variables, *Accounting results per capita* and *Debt per capita*. The accounting results variable is calculated as the difference between the income of the municipality (taxes and subsidies) and its expenses (personnel, subsidies, purchases and financial spending) per capita. The debt variable is the per capita debt outstanding at the end of the year.

4.2.3 Private contractors

Our dataset indicates the identity of the winner of a tender. Using its location, we can compute *Distance*, which is equal to the distance between the winner and the contracting authority. This allows us to control for the impact of suspicion of favoritism in a further step.

4.3 Corruption cases

In France, there is no institution that maintains a centralized and exhaustive registry of corruption cases to make such data public and easily accessible. To collect this information, we used an online platform collecting press articles from approximately 8,000 sources.¹¹ We collected publicly published alleged or adjudicated cases of favoritism in public procurement. We also consulted legal websites to collect case laws. We restricted our collection to France from 2005 to 2016. We examined both local and national press. We eventually obtained 94 suspected cases of favoritism. We created a variable *Suspect*, which is equal to one if the municipality is under a formal investigation (see Table 7). A total of 53 cases (51%) have been prosecuted.

Summary statistics of our data are presented in Table 8.

5 Empirical Strategy

We examine the effect of suspicion of favoritism using a differences-in-differences methodology that involves estimating the following regression:

$$Y_{ijt} = \beta X_{ijt} + \delta I_{ijt} + \alpha_i + \alpha_j + \epsilon_{ijt} \quad (1)$$

¹¹<http://www.europresse.com/en/public-library/>

where i indexes municipalities, j indexes contracts, t indexes time, Y_{ijt} is the dependent variable, X_{ijt} is a set of explanatory variables, I_{ijt} is a dummy variable equal to one if the municipality has been under suspicion or is in the neighborhood of a municipality that has been under suspicion by time t in municipality i , and α_i and α_j represent municipality and time fixed effects, respectively.

One difficulty of this setting is that we do not have a unique exogenous shock, namely, the year of being under suspicion, that would allow us to clearly define the control group before and after the shock. As discussed by [Bertrand and Mullainathan \[2003\]](#), we have staggered dates so that our control group is not restricted to municipalities that were not suspected at all. Our control group includes municipalities that were not yet under suspicion but would be eventually. We discuss this potential problem in the robustness check part of this paper. The same empirical strategy is used when examining the impact of suspicion on neighborhood municipalities instead of suspected municipalities themselves.

Using the dataset listing cases of favoritism, we were able to identify the award notices that occurred in suspected municipalities.¹²

According to law, an adapted procedure may be used for contracts of value below the formal European thresholds. However, as discussed before, the use of such a mechanism is not mandatory, as the authority may decide to use a formal mechanism.

¹²We removed the concession contracts – which are a specific type of public procurement – and contracting authorities located overseas. We only kept observations for which the value of the contract is known and excluded the purchase orders.

Therefore, we take advantage of this freedom of choice between an adapted and a formal procedure under the formal thresholds to examine the impact of suspicion of corruption on the degree of formality chosen by a local contracting authority. This impact is considered over two geographic dimensions. The first is the impact on the suspected municipality itself. The second addresses the municipalities located in a calculated radius of 30 miles around the suspected municipality. We ultimately obtain 31,737 observations representing 31 suspected municipalities (see Table 9). The latter represent our treatment group.

6 Results

6.1 Suspicion of Corruption and the Choice of Award Procedure

To examine the consequence of suspicion on the use of formal award procedures, we estimate equation (1) using a logit regression. The dependent variable *Formal procedure* is a dummy equal to one if the municipality awards the contract using a formal procedure. The variable of interest is *Suspect*, which is a dummy equal to one if a municipality has been suspected of favoritism. It thus estimates the likelihood of using a formal procedure when the municipality is under suspicion. As the serial independence assumption is likely to be violated, we cluster the standard errors at

the county level (Bertrand et al. [2004]). Results are provided in Table 10.

Columns 1 and 2 show estimates of a probit regression of the effect of suspicion on the choice of award mechanism in a suspected municipality. As expected, we observe no significant effect of suspicion (as long as time and municipalities fixed effects are included), meaning that municipalities do not change their behavior once under suspicion. This is consistent with our Proposition 1 suggesting that as soon as one municipality is suspected of being corrupt, the probability of being effectively convicted is independent of its adaptation. On the contrary, changing the way contracts are awarded might signal past bad behaviors. The best strategy is to continue as before and wait for the investigation results.

We also observe that the potential number of participants in the tender does not significantly increase the probability of using a formal procedure. The complexity of the contract is positively and significantly associated with the adoption of a formal procedure, as indicated by the coefficients *value* and *number of divisions*, which is not in accordance with the propositions of Bajari et al. [2009]¹³. The variables *accounting results* and *debt* are not significant and do not influence municipalities' choices.

In the same Table 10, columns 3 and 4, we examine the impact of having a neighboring municipality under suspicion on the use of formal award procedures. The primary variable of interest is *Neighbor*, which is a dummy equal to one if the municipality

¹³We must keep in mind that we are only considering contracts with values under the European thresholds (i.e., not extremely complex).

is located within a radius of 30 miles of a suspected one. As expected (see our Proposition 3), the associated coefficient is significantly positive as long as fixed effects are introduced. This means that neighboring municipalities react by increasing their likelihood of adopting a formal instead of an adapted procedure. This suggests that for municipalities located near suspected ones, the scrutiny of their actions increases, as does their probability of being detected, giving them incentives to adapt quickly to the new circumstances.

6.2 Suspicion of corruption and the number of participants

Even if suspected municipalities do not react to investigations of favoritism by changing the award procedures for their procurement contracts, they might make efforts to reduce favoritism within a given procedure. In other words, suspected municipalities might not change their award procedures to avoid revealing information about their culpability, but they might want to reduce favoritism to reduce the sanction, if they were ultimately convicted (see our Proposition 2). If municipalities follow such a strategy, this would lead suspected municipalities to increase competition by giving incentives to competitors to make offers when tenders are launched. This would also lead them to select fewer local suppliers (i.e., to reduce favoritism). The extent of localism consists of the calculation of the distance between the contracting authority and the location of the winning contractor. As contracts are usually divided into

several lots, we focus our analysis at the division level instead of the overall contract. The empirical strategy is analogous to the one given in equation (1). We examine the effect of suspicion of favoritism on the number of participants and localism using a differences-in-differences methodology. Except for *deadline*, the variables are identical to those used for the primary set of regressions in section 5 (see Table 11). *Deadline* is calculated as the number of days between the publication date of the tender and the date of submission of the offers. We expect that the longer the time left to participate in a bid for a contract is, the higher the number of bidders.

As the number of participants is a count variable that takes only nonnegative integer values, we estimate equation 1 using a Poisson regression. As it is always informative to perform an OLS regression in such a case (Wooldridge [2013]), we first display the results from this estimation.

The effects of suspicion in a suspected municipality on the number of participants in the tender are given in Table 12. Columns 1 to 4 show estimates from the OLS regressions, whereas columns 5 to 8 show those from the Poisson regressions.

We observe that municipalities being suspected of corruption do attract more bidders in their negotiated procedures compared to other municipalities (columns 2 and 6), as long as our specifications include both time and municipality fixed effects. We interpret this result as a strategy of the suspected municipalities to minimize their penalties if they were ultimately convicted (see our Proposition 2). In addition, we

observe that the deadline, calculated as the difference between the deadline for submitting an offer and the publication date of the call for tenders, has a positive and significant impact on the number of bidders in the OLS and Poisson regressions, as expected.

Table 12 also assesses the impact on the number of participants in neighboring municipalities. Columns 3 and 4 provide OLS estimates and show that, as expected, there is no significant impact of suspicion in a neighboring municipality on participation. These results remain valid in columns 7 and 8, where we perform a Poisson regression. As for the suspected municipalities, the deadline has a positive and significant impact.

6.3 Suspicion of corruption and localism

We assess the impact of suspicion on localism. To this end, we calculate the distance between the municipality of the contracting authority and that of the contractor (see Table 13).

We expect our variable of interest *Suspect* to positively impact the distance between the contracting authority and the contractor. Indeed, corruption is known to be a way for local contractors to be favored. We use two strategies to analyze its impact, namely, an OLS and a tobit regression. The tobit regression is especially helpful if many values of a dependent variable are zeros. This is the case in our setting, as

14% of observations are related to a null distance between the municipality and the winning contractor (i.e., both are in the same city). Results are provided in Table 14.

We observe that municipalities being suspected of corruption do select more distant bidders compared to other municipalities in their adapted procedures (columns 2 and 6). We interpret this result as a strategy of the suspected municipalities to minimize their penalty if they were ultimately convicted (see our Proposition 2). In addition, we observe that the deadline, calculated as the difference between the deadline for submitting an offer and the publication date of the call for tenders, has a positive and significant impact in the OLS and Poisson regressions, as expected. More surprisingly, we also observe that the higher the value of the contract is, the nearer the winning company.

Table 14 also assesses the impact on the distance of winning companies in neighboring municipalities. Columns 3 and 4 provide OLS estimates and show that there is no significant impact of suspicion in a neighboring municipality on participation. This result changes in columns 7 and 8, where we perform a Poisson regression. As long as municipality fixed effects are introduced, neighboring municipalities increase localism when using adapted procedures. As for the suspected municipalities, the deadline has a positive and significant impact, and the value of the contract awarded has a negative and significant impact.

7 Robustness checks

One weakness of our estimations is the control group we used. Indeed, we show in Table 10 that suspicion of corruption has a significant and positive impact in the neighboring municipalities on their choice of formal award mechanism. This may make our control group dependent on the treatment group. Therefore, we run a set of probit regressions similar to those from section 5.1, but we exclude the neighbors from the sample.

Estimates of the impact of suspicion of corruption on the choice of the awarding mechanism are displayed in Table 15. Columns 1 and 2 show that the variable of interest, *Suspect*, is still not significant as long as municipality fixed effects are included. The results concerning the effect of suspicion on the location of contractors are also unchanged (results are reported in Table 17). However, the mild effect we found on the number of bidders is no longer observed (results are reported in Table 16)

We also rerun our estimates defining our variable *Neighbor* using a range of 15 instead of 30 miles. The results changed slightly (results are reported in Tables 18, 19 and 20).

We observe that suspicion of corruption has a significant and positive impact in the neighboring municipalities on the choice of formal award procedures. This is specific to municipalities within a range of 15 miles. This might be explained by the fear of falling under suspicion in the very near future, knowing that when a private bidder corrupted a municipality, such a bidder might apply the same strategy in several

nearby municipalities. This effect is not observed within a radius of 30 to 60 miles. As observed previously, there is no influence on the number of bidders; however, we now observe a negative impact on the distance of the location of winning bidders for municipalities far from suspected ones. This might be explained by the fact that these municipalities are far from public scrutiny and do not fear being suspected.

8 Conclusion

Using data on public procurement in French municipalities, we assess the impact of suspicion of corruption on the choice of formal award procedures. We observe that suspected municipalities (i.e., those under investigation) do not react by changing their award procedures. One plausible explanation is that such municipalities have no interest in changing their behavior as long as investigations are pending. Behaviors that facilitate corruption have to be hidden, knowing the cost incurred in the event of detection. As soon as one municipality is suspected of being corrupt, the probability of being effectively convicted is independent of its adaptation. An adaptation might even be perceived as an element of proof that a certain aspect of the way contracts were awarded was improper. However, although suspected municipalities do not react by changing the way they award contracts formally, they nevertheless try to attract more bidders and reduce localism once under suspicion. This is because if they were to be convicted, the fines would be higher if they continued as in the past.

In addition, our results indicate that suspicion has a positive effect on the use of formal procedures in neighboring municipalities. When under the spotlight, neighbors experience “negative” externalities from a suspected municipality and have an incentive to adapt in order to reduce the probability of being detected or suspected. This is good news, considering that uncorrupted municipalities have no reason to adapt. Knowing that investigations and prosecutions of corruption in public procurement are rare, this means that investigations have a positive impact not only on the very few suspected municipalities but also on potentially corrupt neighboring municipalities.

9 Tables

Table 1: The cost of corruption

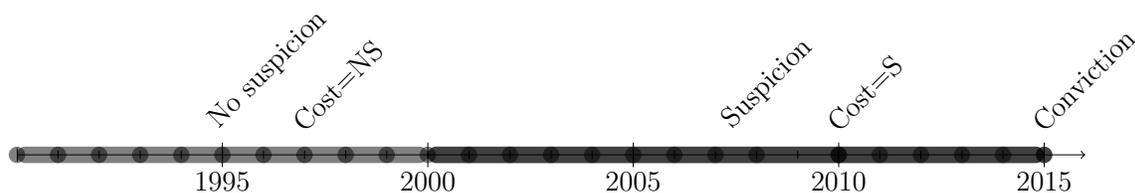


Table 2: Public procurement thresholds for sub-central contracting authorities (2006-2015)

	Supplies and services	Work
2006-2007	210 000 €	5 270 000 €
2008-2009	206 000 €	5 150 000 €
2010-2011	193 000 €	4 485 000 €
2012-2013	200 000 €	5 000 000 €
2014-2015	207 000 €	5 186 000 €

Table 3: Distribution of the award mechanisms - All contracting authorities

	Percent
Adapted procedure	69
Open auction	22
Negotiated procedure	3
Restricted auction	1
Others	5

Table 4: Yearly distribution of calls for tenders and award notices by sub-central authorities (2006-2015)

Year	Calls for tenders		Award notices	
	Freq	Percent	Freq	Percent
2006	89 958	10.97	10 161	15.8
2007	92 646	11.30	7 402	11.5
2008	76 555	9.34	6 345	9.9
2009	74 731	9.11	4 857	7.6
2010	80 977	9.87	6 305	9.8
2011	85 848	10.47	7 554	11.8
2012	74 398	9.07	6 354	9.9
2013	83 588	10.19	5 834	9.1
2014	78 022	9.51	4 699	7.3
2015	83 320	10.16	4 793	7.5
Total	820 043	100	64 304	100

Note: This table only considers contracts at the municipality level. Frequencies of calls for tenders and award notices include contracts both above and below the EU formal threshold. However, they are restricted to notices for which the contract value is clearly stated. Additionally, we exclude instances of purchase orders and contracts subject to a definite and conditional value.

Table 5: Sample distribution by award mechanism (2006-2015)

Award mechanism	Calls for tenders		Award notices	
	Freq	Percent	Freq	Percent
Adapted procedure	647 519	79%	36 087	56%
Open auction	126 478	15%	23 017	36%
Negotiated procedure	15 083	2%	3 647	6%
Restricted auction	4 662	1%	1 209	2%
Other procedures	26 301	3%	344	1%
Total	820 043	100	64 304	100

Note: This table only considers contracts at the municipality level. Frequencies of calls for tenders and award notices include contracts both above and below the EU formal threshold. However, they are restricted to notices for which the contract value is clearly stated. Additionally, we exclude instances of purchase orders and contracts subject to a definite and conditional value.

Table 6: Sample distribution by product type over the period 2006-2015

Sectors	Calls for tenders		Award notices	
	Freq	Percent	Freq	Percent
Public works	405 214	49.4	37 245	57.9
Supplies	115 060	14.0	7 098	11.0
Services	299 769	36.6	11 992	18.6
Total	820 043	100	64 304	100

Note: This table only considers contracts at the municipality level. Frequencies of calls for tenders and award notices include contracts both above and below the EU formal threshold. However, they are restricted to notices for which the contract value is clearly stated. Additionally, we exclude instances of purchase orders and contracts subject to a definite and conditional value.

Table 7: Distribution of suspected favoritism cases between 2006 and 2015

Year of suspicion	Number of observations	Percent
2006	6	5.8
2007	14	13.5
2008	8	7.7
2009	14	13.5
2010	12	11.5
2011	10	9.6
2012	6	5.8
2013	15	14.4
2014	6	5.8
2015	3	2.9
Total	94	100

Note: These cases were retrieved using an online platform collecting press articles from approximately 8,000 sources and through legal websites. We collected publicly published alleged or adjudicated cases of favoritism in public procurement. We examined both local and national press but restricted our analysis to cases of favoritism at the municipal level.

Table 8: Summary statistics for the award mechanism dataset

	count	mean	sd	min	max
Formal procedure	31544	.2505389	.4333303	0	1
Value	31544	245631.6	524194.8	4000	5186000
Average number of bidders_t-1	31544	4.85723	3.72616	.6666667	99
Number of divisions	31544	2.363175	2.907167	1	34
Accounting results per capita	31544	182.6109	327.1282	.0186811	22275.36
Debt per capita	31544	1217.602	1950.492	.0862962	132055.1

Table 9: Distribution of award mechanisms between 2006 and 2015

Award mechanism	Suspect		Not Suspect	
	Freq	Perc	Freq	Perc
Adapted procedure	1 061	72.9	22 580	75
Formal procedure	395	27.1	7 508	25
Total	1 456	100	30 088	100

Note: This table gives frequencies for contracts *below* the EU formal threshold. This sub-sample represents the cases where the municipalities are able to choose between an adapted and a formal procedure. *Suspect* indicates municipalities where an official investigation of favoritism has been launched.

Table 11: Summary statistics for the number of bidders dataset

	count	mean	sd	min	max
Number of bidders	18622	4.305069	4.172299	0	133
Deadline	18622	26.53088	10.29344	2	111
Value	18622	397677.4	663854.9	4000	5186000
Number of divisions	18622	4.712759	4.688667	1	24
Accounting results per capita	18622	4.872138	.9035501	-3.980242	9.040305
Debt per capita	18622	6.67283	1.143478	-1.961643	10.94368

Table 10: Choice of formal award mechanism in suspected and neighboring municipalities

	(1)	(2)	(3)	(4)
1.Suspect	0.423* (0.217)	-0.028 (0.252)		
Log (Average number of bidders t-1)	-0.062 (0.051)	0.000 (0.062)	-0.073 (0.053)	-0.029 (0.058)
Log (value)	0.545*** (0.025)	0.501*** (0.033)	0.539*** (0.026)	0.499*** (0.032)
Log (number of divisions)	0.127*** (0.032)	0.139*** (0.034)	0.144*** (0.032)	0.146*** (0.035)
Accounting results per capita	-0.029 (0.050)	0.030 (0.076)	-0.002 (0.054)	0.022 (0.080)
Debt per capita	-0.002 (0.055)	-0.344 (0.237)	-0.014 (0.053)	-0.340 (0.249)
Services	0.833*** (0.064)	0.725*** (0.072)	0.827*** (0.067)	0.720*** (0.077)
Supplies	0.766*** (0.090)	0.789*** (0.077)	0.757*** (0.090)	0.796*** (0.082)
Neighbor=1			0.163 (0.127)	0.476** (0.207)
Time fixed-effect	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES
Log-likelihood	-14956	-8442	-13764	-7506
pseudo- R^2	0.158	0.148	0.155	0.145
Obs	31544	26930	29360	24770

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. The dependent variable is a dummy equal to one if the contract of municipality i at time t is awarded through a formal procedure. Suspected municipalities are designated as such when an investigation of favoritism has been opened. Neighboring municipalities are in a radius of 30 miles. The omitted category of reference for the sector is public works. Standard errors are clustered at the county level.

Table 12: Effects of suspicion on the number of bidders in suspected and neighboring municipalities

	OLS				Poisson			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.Suspect	-0.589** (0.238)	-0.613 (0.459)			-0.150*** (0.055)	-0.150 (0.116)		
Adaptated procedure	0.156 (0.224)	0.011 (0.270)	0.201 (0.290)	0.050 (0.277)	0.035 (0.052)	0.005 (0.063)	0.045 (0.069)	0.014 (0.065)
1.Suspect × Adaptated procedure	0.243 (0.316)	0.500* (0.282)			0.070 (0.074)	0.128* (0.066)		
Deadline	0.715*** (0.130)	0.500*** (0.112)	0.689*** (0.138)	0.485*** (0.119)	0.166*** (0.031)	0.122*** (0.027)	0.159*** (0.033)	0.119*** (0.028)
Log (value)	0.019 (0.049)	-0.022 (0.052)	0.028 (0.052)	-0.023 (0.054)	0.004 (0.011)	-0.005 (0.013)	0.006 (0.012)	-0.005 (0.013)
Number of divisions	0.053** (0.025)	0.061** (0.030)	0.056** (0.026)	0.067** (0.031)	0.012** (0.005)	0.015** (0.007)	0.012** (0.006)	0.016** (0.007)
Accounting results per capita	0.048 (0.066)	0.071 (0.081)	0.057 (0.070)	0.059 (0.087)	0.011 (0.016)	0.014 (0.018)	0.013 (0.016)	0.011 (0.019)
Debt per capita	-0.070 (0.083)	-0.345** (0.167)	-0.062 (0.081)	-0.328* (0.169)	-0.016 (0.018)	-0.085** (0.041)	-0.014 (0.018)	-0.082** (0.042)
Services	0.975*** (0.126)	0.972*** (0.131)	0.984*** (0.132)	0.993*** (0.136)	0.216*** (0.027)	0.223*** (0.029)	0.217*** (0.028)	0.227*** (0.030)
Supplies	-0.322** (0.136)	-0.222 (0.140)	-0.310** (0.141)	-0.204 (0.142)	-0.087** (0.037)	-0.061 (0.039)	-0.084** (0.038)	-0.056 (0.039)
Neighbor=1			0.250 (0.415)	-0.115 (0.783)			0.056 (0.095)	0.009 (0.165)
Neighbor=1 × Adaptated procedure			0.067 (0.452)	-0.160 (0.637)			0.017 (0.103)	-0.027 (0.145)
Time fixed-effect	YES	YES	YES	YES	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES	NO	YES	NO	YES
Log-likelihood	-52805	-49644	-50082	-47171	-49647	-41748	-47153	-39547
R^2	0.023	0.020	0.024	0.021				
pseudo- R^2					0.017		0.018	
Obs	18622	18622	17623	17623	18622	18299	17623	17304

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Contracts below the EU formal threshold. The dependent variable is the number of bidders participating in the tender. Suspected municipalities are designated as such when an investigation of favoritism has been opened. Neighboring municipalities are in a radius of 30 miles. The omitted category of reference for the type of procedure is the adapted procedure, and the category for the sector is public works. Standard errors are clustered at the county level.

Table 13: Summary statistics for the localism dataset

	count	mean	sd	min	max
Distance	12973	66.64492	134.2348	0	890.3326
Deadline	12973	26.40523	10.40021	4	111
Value	12973	447642	678962.2	4000	5100000
Number of bidders	12973	4.129037	3.293229	1	56
Accounting results per capita	12973	218.1008	507.1984	.0186811	8436.354
Debt per capita	12973	1363.74	2284.442	.1406272	28407.85

Table 14: Effects of suspicion on the location of contractors in suspected and neighboring municipalities

	OLS				Tobit			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.Suspect	41.454*** (14.925)	112.940*** (26.814)			57.567*** (20.058)	137.425*** (1.470)		
Adaptated procedure	-16.567 (14.954)	-10.351 (11.326)	-8.087 (17.594)	-1.053 (17.157)	-17.126 (17.258)	-7.801*** (0.111)	-6.479 (21.398)	2.173*** (0.113)
1.Suspect × Adaptated procedure	-41.611** (18.387)	-72.281*** (11.602)			-53.474*** (20.068)	-78.150*** (1.466)		
Deadline	11.349* (6.082)	14.679** (7.037)	13.646** (6.094)	17.772** (7.065)	14.308** (6.761)	17.879*** (0.034)	16.242** (6.727)	20.961*** (0.034)
Log (value)	-6.144*** (1.762)	-3.666** (1.814)	-6.152*** (1.852)	-4.109** (1.919)	-5.786*** (2.025)	-3.267*** (0.009)	-5.604*** (2.126)	-3.517*** (0.009)
Number of divisions	-0.795 (0.600)	-1.430* (0.743)	-0.691 (0.619)	-1.396* (0.775)	-1.041 (0.737)	-1.606*** (0.009)	-0.990 (0.757)	-1.591*** (0.009)
Accounting results per capita	-1.702 (2.525)	-2.078 (4.738)	-0.329 (2.073)	-3.597 (4.785)	-0.088 (2.538)	-2.125*** (0.021)	0.969 (2.408)	-3.705*** (0.022)
Debt per capita	1.603 (1.930)	-20.012*** (5.677)	2.301 (1.919)	-21.820*** (5.817)	0.213 (2.159)	-22.264*** (0.016)	0.958 (2.146)	-24.253*** (0.017)
Services	58.020*** (6.668)	55.389*** (6.979)	57.045*** (6.799)	54.556*** (7.384)	66.593*** (7.267)	62.010*** (0.215)	66.606*** (7.556)	61.813*** (0.225)
Supplies	78.428*** (9.206)	76.969*** (8.513)	75.255*** (9.020)	73.845*** (8.564)	85.213*** (10.322)	84.113*** (0.281)	83.016*** (10.187)	81.211*** (0.287)
neighbor=1			25.409 (32.351)	-0.752 (27.258)			32.582 (35.616)	4.262*** (0.315)
neighbor=1 × Adaptated procedure			-19.517 (32.832)	-28.431 (23.857)			-23.391 (35.726)	-30.215*** (0.279)
Time fixed-effect	YES	YES	YES	YES	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES	NO	YES	NO	YES
Log-likelihood	-81442	-80752	-77111	-76451	-72433	-71745	-68873	-68221
R^2	0.078	0.051	0.078	0.050				
pseudo- R^2					0.007	0.016	0.007	0.016
Obs	12973	12973	12283	12283	12973	12973	12283	12283

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Contracts below the EU formal threshold. The dependent variable is the distance between the contracting authority and the location of the contractor. Suspected municipalities are designated as such when an investigation of favoritism has been opened. Neighboring municipalities are in a radius of 30 miles. The omitted category of reference for the type of procedure is the adapted procedure, and the category for the sector is public works. Standard errors are clustered at the county level.

Table 15: Choice of the formal award mechanism in suspected municipalities - Exclusion of neighbors in the control group

	(1)	(2)
Suspect=1	0.487** (0.244)	-0.133 (0.247)
Log (Average number of bidders t-1)	-0.047 (0.053)	-0.029 (0.065)
Log (value)	0.565*** (0.029)	0.524*** (0.037)
Log (number of divisions)	0.116*** (0.034)	0.129*** (0.037)
Accounting results per capita	-0.049 (0.047)	0.113 (0.082)
Debt per capita	-0.019 (0.054)	-0.352 (0.295)
Services	0.823*** (0.071)	0.729*** (0.083)
Supplies	0.671*** (0.103)	0.742*** (0.089)
Time fixed-effect	YES	YES
Municipality fixed-effect	NO	YES
Log-likelihood	-11738	-6555
pseudo- R^2	0.169	0.156
Obs	25351	21544

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. Neighboring municipalities within a range of 30 miles near suspected ones are excluded. The dependent variable is a dummy equal to one if the contract of municipality i at time t is awarded through a formal procedure. Suspected municipalities are designated as such when an investigation of favoritism has been opened. The omitted category of reference for the sector is public works. Standard errors are clustered at the county level.

Table 16: Effects of suspicion on the number of bidders in suspected municipalities - Exclusion of neighbors in the control group

	OLS		Poisson	
	(1)	(2)	(3)	(4)
Suspect=1	-0.203 (0.863)	-0.007 (0.454)	-0.055 (0.238)	0.014 (0.119)
Adaptated procedure	0.465** (0.200)	0.110 (0.298)	0.111** (0.051)	0.034 (0.075)
Suspect=1 × Adaptated procedure	-0.175 (0.871)	0.379 (0.326)	-0.036 (0.240)	0.093 (0.082)
Deadline	0.826*** (0.112)	0.441*** (0.163)	0.198*** (0.026)	0.113*** (0.040)
Log (value)	0.076* (0.040)	0.033 (0.051)	0.019* (0.010)	0.009 (0.013)
Number of divisions	0.033** (0.014)	0.042 (0.026)	0.008** (0.003)	0.010 (0.006)
Accounting results per capita	0.037 (0.072)	0.043 (0.133)	0.008 (0.017)	0.012 (0.033)
Debt per capita	-0.111*** (0.036)	-0.652*** (0.156)	-0.026*** (0.008)	-0.167*** (0.038)
Services	0.903*** (0.115)	0.811*** (0.159)	0.212*** (0.026)	0.201*** (0.036)
Supplies	0.128 (0.177)	0.204 (0.202)	0.031 (0.045)	0.054 (0.054)
Time fixed-effect	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES
Log-likelihood	-25888	-24156	-23856	-19726
R^2	0.021	0.014		
pseudo- R^2			0.016	
Obs	9230	9230	9230	9041

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. Neighboring municipalities within a range of 30 miles near suspected ones are excluded. The dependent variable is the number of bidders participating in the tender. Suspected municipalities are designated as such when an investigation for favoritism has been opened. The omitted category of reference for the type of procedure is the adapted procedure, and the category for the sector is public works. Standard errors are clustered at the county level.

Table 17: Effects of suspicion on the location of contractors in suspected municipalities
- Exclusion of neighbors in the control group

	OLS		Tobit	
	(1)	(2)	(3)	(4)
Suspect=1	55.557*** (16.798)	142.354*** (40.349)	79.560*** (22.895)	170.878*** (41.754)
Adaptated procedure	-7.622 (17.122)	-3.971 (17.650)	-5.997 (20.656)	-0.662 (19.021)
Suspect=1 × Adaptated procedure	-55.609** (21.672)	-74.912*** (17.694)	-69.933*** (24.380)	-80.859*** (19.209)
Deadline	8.944 (5.642)	12.147* (6.691)	11.001* (6.308)	15.415** (7.250)
Log (value)	-7.227*** (1.822)	-4.148** (2.063)	-6.621*** (2.127)	-3.735 (2.332)
Number of divisions	-0.662 (0.630)	-1.410* (0.841)	-1.033 (0.771)	-1.608 (1.025)
Accounting results per capita	1.575 (1.935)	-9.185* (4.756)	2.688 (2.429)	-10.721** (5.230)
Debt per capita	-0.733 (1.838)	-20.681*** (6.414)	-2.247 (2.215)	-22.928*** (7.218)
Services	50.475*** (6.711)	46.360*** (7.206)	59.244*** (7.433)	51.803*** (7.886)
Supplies	67.341*** (8.503)	69.078*** (8.884)	74.080*** (9.768)	75.094*** (9.837)
Time fixed-effect	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES
Log-likelihood	-65213	-64585	-57893	-57265
R^2	0.074	0.047		
pseudo- R^2			0.007	0.017
Obs	10461	10461	10461	10461

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. Neighboring municipalities within a range of 30 miles near suspected ones are excluded. The dependent variable is the distance between the contracting authority and the location of the contractor. Suspected municipalities are designated as such when an investigation of favoritism has been opened. The omitted category of reference for the type of procedure is the adapted procedure, and the category for the sector is public works. Standard errors are clustered at the county level.

Table 18: Choice of formal award mechanism in neighboring municipalities - Validity of the radius

	Radius 0-25 miles		Radius 30-60 miles	
	(1)	(2)	(3)	(4)
Neighbor=1	0.208 (0.141)	0.688*** (0.222)	0.001 (0.101)	0.232 (0.177)
Log (Average number of bidders t-1)	-0.075 (0.053)	-0.029 (0.059)	-0.063 (0.052)	-0.025 (0.060)
Log (value)	0.538*** (0.026)	0.498*** (0.032)	0.539*** (0.026)	0.499*** (0.033)
Log (number of divisions)	0.144*** (0.034)	0.145*** (0.035)	0.137*** (0.033)	0.141*** (0.035)
Accounting results per capita	-0.000 (0.052)	0.024 (0.080)	-0.009 (0.052)	0.039 (0.085)
Debt per capita	-0.013 (0.054)	-0.346 (0.255)	-0.013 (0.054)	-0.340 (0.241)
Services	0.826*** (0.067)	0.720*** (0.077)	0.835*** (0.067)	0.712*** (0.079)
Supplies	0.753*** (0.091)	0.791*** (0.081)	0.771*** (0.094)	0.789*** (0.083)
Time fixed-effect	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES
Log-likelihood	-13757	-7486	-13775	-7515
pseudo- R^2	0.155	0.147	0.154	0.144
Obs	29360	24770	29360	24770

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. The dependent variable is a dummy equal to one if the contract of municipality i at time t is awarded through a formal procedure. The omitted category of reference for the sector is public works. Standard errors are clustered at the county level.

Table 19: Effects of suspicion on the number of bidders in neighboring municipalities
- Validity of the radius

	OLS – Radius 0-15 miles		Poisson – Radius 0-15 miles		OLS – Radius 30-60 miles		Poisson – Radius 30-60 miles	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Neighbor=1	0.575** (0.248)	0.399 (0.565)	0.131** (0.057)	0.082 (0.119)	-0.276 (0.289)	-0.772 (0.571)	-0.064 (0.063)	-0.189 (0.128)
Adaptated procedure	0.275* (0.164)	0.033 (0.327)	0.062 (0.039)	0.006 (0.077)	-0.113 (0.268)	-0.383 (0.595)	-0.026 (0.058)	-0.087 (0.131)
Neighbor=1 × Adaptated procedure	-0.241 (0.254)	-0.033 (0.533)	-0.054 (0.058)	0.000 (0.114)	0.383 (0.306)	0.531 (0.587)	0.089 (0.067)	0.129 (0.130)
Deadline	0.682*** (0.084)	0.489*** (0.119)	0.158*** (0.019)	0.119*** (0.028)	0.691*** (0.084)	0.491*** (0.118)	0.160*** (0.019)	0.120*** (0.028)
Log (value)	0.023 (0.033)	-0.023 (0.055)	0.005 (0.008)	-0.005 (0.013)	0.026 (0.033)	-0.023 (0.054)	0.006 (0.008)	-0.005 (0.013)
Number of divisions	0.059*** (0.015)	0.067** (0.031)	0.013*** (0.003)	0.016** (0.007)	0.054*** (0.015)	0.067** (0.031)	0.012*** (0.003)	0.016** (0.007)
Accounting results per capita	0.059 (0.037)	0.045 (0.083)	0.013 (0.009)	0.008 (0.019)	0.046 (0.037)	0.049 (0.085)	0.010 (0.009)	0.009 (0.019)
Debt per capita	-0.070*** (0.026)	-0.342** (0.167)	-0.015*** (0.006)	-0.084** (0.041)	-0.056** (0.027)	-0.312* (0.170)	-0.012** (0.006)	-0.077* (0.041)
Services	0.955*** (0.088)	0.993*** (0.136)	0.211*** (0.018)	0.228*** (0.030)	0.980*** (0.088)	0.989*** (0.137)	0.216*** (0.018)	0.227*** (0.030)
Supplies	-0.338*** (0.102)	-0.200 (0.142)	-0.090*** (0.027)	-0.056 (0.039)	-0.325*** (0.103)	-0.200 (0.143)	-0.087*** (0.028)	-0.056 (0.039)
Time fixed-effect	YES	YES	YES	YES	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES	NO	YES	NO	YES
Log-likelihood	-50074	-47169	-47124	-39541	-50087	-47169	-47173	-39539
R^2	0.025	0.021			0.023	0.021		
pseudo- R^2			0.018				0.017	
Obs	17623	17623	17623	17304	17623	17623	17623	17304

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. The dependent variable is a dummy equal to one if the contract of municipality i at time t is awarded through a formal procedure. The omitted category of reference for the sector is public works. Standard errors are clustered at the county level.

Table 20: Effects of suspicion on the location of contractors in neighboring municipalities - Validity of the radius

	OLS – Radius 0-15 miles		Tobit – Radius 0-15 miles		OLS – Radius 30-60 miles		Tobit – Radius 30-60 miles	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Neighbor=1	-3.483 (25.934)	24.551 (38.336)	6.026 (31.404)	31.392*** (0.381)	44.979* (26.099)	11.106 (18.527)	46.830 (31.194)	8.347*** (0.293)
Adaptated procedure	-18.848 (17.554)	-5.576 (13.487)	-18.184 (20.234)	-2.496*** (0.108)	-10.816 (15.709)	-4.895 (11.360)	-10.821 (18.130)	-2.637*** (0.111)
Neighbor=1 × Adaptated procedure	22.591 (27.680)	-22.998 (26.833)	16.018 (32.458)	-26.247*** (0.373)	-38.999 (24.526)	-20.592 (16.090)	-42.418 (28.806)	-19.146*** (0.263)
Deadline	14.112** (5.978)	17.900** (7.017)	16.693** (6.632)	21.087*** (0.033)	13.901** (6.049)	17.812** (7.031)	16.501** (6.723)	21.008*** (0.034)
Log (value)	-6.098*** (1.822)	-4.016** (1.908)	-5.521*** (2.094)	-3.414*** (0.009)	-5.917*** (1.869)	-3.975** (1.923)	-5.402** (2.142)	-3.376*** (0.009)
Number of divisions	-0.694 (0.617)	-1.406* (0.773)	-1.006 (0.755)	-1.602*** (0.009)	-0.766 (0.634)	-1.407* (0.771)	-1.058 (0.780)	-1.599*** (0.010)
Accounting results per capita	0.202 (2.029)	-4.238 (4.931)	1.431 (2.366)	-4.359*** (0.021)	-0.776 (2.268)	-4.227 (4.843)	0.315 (2.554)	-4.341*** (0.021)
Debt per capita	2.006 (1.838)	-21.705*** (5.839)	0.616 (2.080)	-24.152*** (0.016)	2.529 (1.900)	-21.074*** (5.844)	1.176 (2.094)	-23.385*** (0.016)
Services	56.993*** (6.739)	54.627*** (7.366)	66.601*** (7.492)	61.880*** (0.226)	57.344*** (6.853)	54.481*** (7.346)	66.841*** (7.610)	61.719*** (0.224)
Supplies	75.229*** (8.876)	73.789*** (8.554)	82.941*** (10.034)	81.138*** (0.292)	75.267*** (9.057)	73.742*** (8.519)	82.834*** (10.261)	81.089*** (0.287)
Time fixed-effect	YES	YES	YES	YES	YES	YES	YES	YES
Municipality fixed-effect	NO	YES	NO	YES	NO	YES	NO	YES
Log-likelihood	-77102	-76454	-68866	-68222	-77110	-76454	-68875	-68222
R^2	0.080	0.050			0.079	0.050		
pseudo- R^2			0.007	0.016			0.007	0.016
Obs	12283	12283	12283	12283	12283	12283	12283	12283

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Probit regressions. Contracts below the EU formal threshold. The dependent variable is a dummy equal to one if the contract of municipality i at time t is awarded through a formal procedure. The omitted category of reference for the sector is public works. Standard errors are clustered at the county level.

References

- Bajari, P., S. Houghton, and S. Tadelis (2014, April). Bidding for Incomplete Contracts: An Empirical Analysis of Adaptation Costs. *American Economic Review* 104(4), 1288–1319.
- Bajari, P., R. McMillan, and S. Tadelis (2009). Auctions versus negotiations in procurement: An empirical analysis. *Journal of Law, Economics, and Organization* 25(2), 372–399.
- Bajari, P. and S. Tadelis (2001). Incentives versus Transaction Costs: A Theory of Procurement Contracts. *The RAND Journal of Economics* 32(3), 387–407.
- Bertrand, M., E. Duflo, and S. Mullainathan (2004, February). How Much Should We Trust Differences-In-Differences Estimates? *The Quarterly Journal of Economics* 119(1), 249–275.
- Bertrand, M. and S. Mullainathan (2003). Enjoying the Quiet Life? Corporate Governance and Managerial Preferences. *Journal of Political Economy* 111(5), 1043–1075.
- Bulow, J. and P. Klemperer (1996). Auctions Versus Negotiations. *The American Economic Review* 86(1), 180–194.
- Burguet, R. and Y.-K. Che (2004). Competitive Procurement with Corruption. *RAND Journal of Economics* 35(1), 50–68.

- Calzolari, G. and G. Spagnolo (2009, August). Relational Contracts and Competitive Screening. SSRN Scholarly Paper ID 1484466, Social Science Research Network, Rochester, NY.
- Chever, L., S. Saussier, and A. Yvrande-Billon (2017). The law of small numbers: investigating the benefits of restricted auctions for public procurement. *Applied Economics* 49(42), 4241–4260.
- Coviello, D. and S. Gagliarducci (2017, August). Tenure in office and public procurement. *American Economic Journal: Economic Policy* 9(3), 59–105.
- Coviello, D., A. Guglielmo, and G. Spagnolo (2018). The effect of discretion on procurement performance. *Management Science* 64(2), 715–738.
- Decarolis, F. (2014, January). Awarding Price, Contract Performance, and Bids Screening: Evidence from Procurement Auctions. *American Economic Journal: Applied Economics* 6(1), 108–132.
- Djankov, S., T. M. Ghossein, A. M. Islam, and F. Saliola (2017). Public procurement regulation and road quality. *World Bank Policy Research Working Paper* (8234).
- Estache, A. and R. Foucart (2018). The scope and limits of accounting and judicial courts intervention in inefficient public procurement. *Journal of Public Economics* 157, 95 – 106.

- Flammer, C. (2018). Competing for Government Procurement Contracts: The Role of Corporate Social Responsibility. *Strategic Management Journal*.
- Goldberg, V. P. (1977). Competitive Bidding and the Production of Precontract Information. *Bell Journal of Economics* 8(1), 250–261.
- Herweg, F. and K. M. Schmidt (2017). Auctions versus negotiations: the effects of inefficient renegotiation. *The RAND Journal of Economics* 48(3), 647–672.
- Kim, I.-G. (1998, January). A model of selective tendering: Does bidding competition deter opportunism by contractors? *The Quarterly Review of Economics and Finance* 38(4), 907–925.
- Knack, S., N. Biletska, and K. Kacker (2017). Deterring kickbacks and encouraging entry in public procurement markets: Evidence from firm surveys in 88 developing countries. *World Bank Policy Research Working Paper* (8078).
- Levin, D. and J. L. Smith (1994). Equilibrium in Auctions with Entry. *The American Economic Review* 84(3), 585–599.
- Moore, J. and C. Staropoli (2018). Horizontal and vertical agreements in ppps. In S. Saussier and J. De Brux (Eds.), *The Economics of Public Private Partnerships*. Springer International Publishing.
- Spiller, P. T. (2008, August). An Institutional Theory of Public Contracts: Regulatory Implications. Working Paper 14152, National Bureau of Economic Research.

Tadelis, S. (2012). Public procurement design: Lessons from the private sector.

International Journal of Industrial Organization 30(3), 297 – 302.

Tran, A. (2011). Which regulations reduce corruption? Evidence from the internal

records of a bribe-paying firm. *Mimeo. School of Public & environmental Affairs.*

Indiana University, Bloomington.

Wooldridge, J. M. (2013, June). *Introductory Econometrics: A Modern Approach.*

Cengage Learning. Google-Books-ID: C0KHwUKxys0C.