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The quality of governance and the use of negotiated procurement procedures: Evidence from the European Union

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Abstract

A key phase in any public-private contracting setting involves the selection of a private contracting partner. Although open competitive tenders (open auctions) are usually the preferred mechanism, recent developments in the academic literature have pointed out that alternatives mechanisms, such as restricted competitive tenders or negotiations, may in fact be a better way to select a private contractor when the contract to be awarded is difficult to specify (Goldberg, 1977; Kelman, 2005; Bajari et al., 2009). The discretion associated with negotiations is, however, often supposed to provide room for corruption and favoritism. In this paper, we investigate the trade-off between classical open competitive tenders, restricted competitive tenders and negotiations. In particular, we study how institutions can affect this trade-off. To this end, we use a European data set on more than 280 000 public procurement contracts in 27 European countries between 2008 and 2012, combined with a new dataset on institutional quality and corruption that expands the World Bank Indicators (Kaufmann et al., 2010) to the regional level. Our results suggest that the use of public procurement contracts that are directly negotiated without any call for competition are significantly associated with environments that do not provide a good quality of governance (i.e. regions and countries with prevalent corruption). We also show that restricted auctions and negotiation with competition are positively associated with complex transactions and a strong institutional environment. This suggests that the contract award mechanism should be tailored to the institutional environment.

Keywords: Auctions, competitive tenders, negotiations, public procurement, public-private contracting, quality of institutions.

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1 Introduction

In the past two decades, the public sector and the organizational of public services have undergone important transformations. Increasingly, public authorities are appealing to the private sector to participe in the provision of public services, such as water, local transportation, highways, and even prisons. To govern these cooperations, public authorities can rely on different kinds of public-private partnerships. Whatever the contractual tools that can be used and adopted to govern the cooperation between public authorities and private firms in pursuit of a public goal, an essential phase in initiating the cooperation between the two entities consist for a public authority to choose a private sector partner and to award the contract or project.

Because public-private contacting involves the use of public monies, open competitive tenders (open auctions) are often seen as the best way for a public authority to select a private contractor, and to award the contract for the provision of a good and/or a service. Open competitive tenders, whereby any interested private contractors can participate and submit a proposal to undertake a public project that has been specified by a public authority, are often argued to allow the public sector to take advantage of competition. This should allow the public sector to achieve best value for taxpayers' money.

Given this widely accepted view of open competitive tenders, it is hardly surprising that most legislations of public-private contracting strongly favor open competitive tenders. For instance, the US Federal Acquisition Regulations (FAR) strongly advocated the use of seal-bid first price auctions as a means to select private contractors. Likewise, according to the *Code des Marchés Publics*, which regulates public procurement in France, while a public authority can freely choose between open and restricted competitive tenders (article 33, section 2, chapitre III, Titre III), the use of alternative procedures with more discretion involved, such as negotiations, are subjected to certain conditions (article 35, section 2, chapitre III, Titre III). Interestingly, the new European Directives voted early 2014 on procurement and concession contracts open the room for more negotiation in public private partnerships. As mentioned by Saussier and Tirole (2015) negotiation will tend to be the rule instead of the exception.

In this paper, we intend to shed light on the trade-off between various mechanisms mentioned previously to select private contractors and to award public contracts to the private sector. We argue that public private contracts should follow two objectives that

are on the one hand selecting the best private partner where negotiation is useful as soon as transactions are complex, on the other hand, limiting favoritism or corruption issues during the selection procedure. Procurement procedures are obviously one tool to achieve those objectives. But using one tool to achieve two objectives is not efficient. The quality of institutions is another tool. We argue that when the quality of institutions is strong, corruption may be less prevalent and more easily dealt with through other legal channels, more discretion can be granted to public authorities to enhance transactional efficiency. On the other hand, when institutions are weak, corruption may be more problematic, and therefore, less discretionary award procedures (i.e., open competitive tenders) should be used in order to foster competition and to reduce scope for corruption. To this end, we study the way public procurement contracts are awarded in Europe. More precisely, we use a European data set containing information concerning public procurements in the 27 European countries, over the 2008-2012 period. This leads us to work with information on more than 680 000 public procurement contracts in more than 150 subnational regions (NUTS levels). We combine this data with a new dataset on governance quality and corruption giving us an indication on the quality of the institutional environment, which expands World Bank Indicators (Kaufmann et al., 2010) to the regional level.

Our empirical analysis shows that more discretionary award (such as restricted competitive tenders, and negotiation with call for competition) is used to award larger project in terms of value. To the extent that the value of a project is an acceptable proxy for project complexity, our results suggest that more complex project are more likely to be awarded through procedures which restricts competition. This is consistent with existing academic literature that suggests that such mechanisms can enhance transactional efficiency. Our results also consistently show that in weak institutional environment, projects are more likely to be awarded through negotiations without call for competition.

To the best of our knowledge, our study is among the first studies to uncover the interrelation between contract award mechanisms and the quality of institutions. While we do not produce a smoking gun analysis on corruption in public procurement, our results nevertheless suggest that the trade off between various contract award mechanism can be related to the quality of institutions. Moreover, by relying on a measure of the quality of institutions at the sub-national level, we are able to control for unobservable (and time invariant) characteristics at the country level. Arguably, this feature

of our data enhance the robustness of our empirical results. At the policy level, our results suggest that the path pursued by the EU to harmonize public procurement and public-private contracting may be problematic as soon as you consider that European countries are characterize by different levels of quality of institutions. More generally, our paper is interested in how trading technologies interact with the institutional environment. As such, we believe that these results on contract award mechanism may also apply to private-private contract setting, where selection mechanisms used to choose an external contractor and to award contract should not only account for the attributes of transactions, but may need to take into account the quality of institutions as well.

The remainder of our paper is organized as follows. In the following section, we briefly summarize the academic literature on the trade-off involved in choosing between various award mechanism. This provides a framework to guide our empirical analysis of award mechanisms in public procurement. We then present the institutional setting and some salient features of public procurement in the EU. Section 4 discusses our data and empirical strategy, while section 5 presents and discusses our results. Finally, concluding remarks follow.

2 Auctions, negotiations and abuse of discretionary power: Some theoretical considerations

In this section, we briefly summarize the relevant literature to guide our analysis on the choice of contract award mechanism. We first start by showing that that competitive tenders and negotiations may both be comparatively efficient to select a contractor and to grant a contract. We then turn our attention to the issue of abuse of discretionary power, and show how this may be related to the quality of institutions.

2.1 Auctions versus negotiations: Is there a trade-off?

In their seminal contribution, Bulow and Klemperer (1996) formally show that the benefits of an extra bidder *always* outweigh the benefits for an auctioneer using the optimal auction design without the extra participant. This result suggests that open competitive tenders unambiguously performs better than any other mechanisms as a means to select

a trading partner. However, in the setting considered by Bulow and Klemperer (1996), the object to be traded is assumed to be well defined, i.e. there is full-contractability, and therefore, price is the only relevant variable to choose a trading partner. Subsequent analyses tend to nuance this strong result.

Manelli and Vincent (1995) show that open competitive tenders may be inefficient when the procurer cares not only about the price, but also about the quality of a good. In their setting, open competitive tenders may lead a procurer to end up with a trading partner offering a low quality good. More generally, when one takes into account that there may be difficulties in specifying fully the scope of cooperation between contracting partners, and therefore the project to be procured, open competitive tenders may not always be the most efficient way of awarding a contract and of selecting a contractor.

There are two main reasons that can be found in the literature to explain this. Firstly, as suggested by Goldberg (1977) and Bajari et al. (2009), negotiations may outperform open competitive tenders because contracting parties can exchange pre-contract information. While competitive tenders stimulates competition, which is beneficial to the procurer, it also stifles communication. In a project, sellers may have important information about suitable specifications of a project, which the procurer may find useful when drafting a contract. Such pre-contract information can help in avoiding costly *ex post* haggling and adaptation. Hence, when projects are complex, and when *ex post* adaptations can be important and contracts are difficult to specify *ex ante*, negotiations may yield benefits that outweigh competitive tenders, by facilitating communication and coordination. Moreover, according to Bajari and Tadelis (2001) and Bajari et al. (2009), to facilitate *ex post* adjustments and adaptation (and avoid important haggling costs), contracts with a low incentive payment structure should be preferred. On the other hand, competitive tenders are more suitable to award high incentive contracts, where price is the principal dimension that matters.

The need to appeal to reputation-based mechanism (relational contacts) as a means to alleviate non-contractability is another reason why one may want to restrict competitive screening and grant more discretion power to the procuring agent (Calzolari and Spagnolo, 2009; Spagnolo, 2012). When a procurer and a pool of firms trade repeatedly over time, the shadow of the future can serve as a motivation device to ensure contracting partners behave accordingly and cooperatively even if such behaviors cannot be fully specified within a contract and enforced by a third party (Macaulay, 1963; Bull, 1987;

Baker et al., 2002, 2008).[1] By restricting competition, the procurer ensures that higher rents accrue to the winner of a project in a procurement. This in turn incentivizes contracting parties to respect engagements made that cannot be contracted on, in hope of securing similar rents in the future.

These recent developments in the literature suggest that simple projects, whose specifications are easily known and specified in a contract, are best awarded through open competitive tenders. In contrast, a procurer can stand to gain to award a more complex project through more discretionary procedures, such as restricted competitive tenders or negotiations. In a public-private procurement setting, empirical evidences on *ex post* adjustments and renegotiations of initial contractual terms are abound (Guasch, 2004; Guccio et al., 2008; Engel et al., 2009; Jung et al., 2013; Beuve et al., 2014; Estache and Saussier, 2014), suggesting that contractability is an issue faced by public sector procurers.[2] This is more likely to be the case for complex projects. Hence, we can expect that more complex projects to be awarded through restricted competitive tenders and negotiations.

Hypothesis 1. *The more complex a project is, the more likely restricted competitive tenders and negotiations will be used to award a project as compared to open competitive tenders.*

Experiences from the field on this issue, although relatively scarce, are somewhat in support of these theoretical insights.[3] On the one hand, using data from a social housing organization in France, Chever and Moore (2013) and Chever et al. (2013) found that more discretionary award procedures used by the social housing agency results in more competitive bids.[4] Unlike the French case, experience in public procurement

[1] For empirical evidence on relational contracting, one can refer to Gil and Marion (2013).

[2] It is worthy to note that Bajari et al. (2014) found the bidders participating in competitive tenders for highway procurement contracts in California anticipate costs associated with *ex post* adjustments of the initial contract and mark up their bids consequently. They estimate these costs to represent between 7.5 to 14% of the winning bid.

[3] It is worthwhile to note that open competitive tenders are far from being the norm in private sector procurement practices (Leffler et al., 2003; Bajari et al., 2009). Leffler et al. (2003) found that there is about 50/50 split between competitive tenders and negotiation in private sector sales of timber in North Caroline and Mississippi. For private sector non residential construction projects in North California, unrestricted open competitive tenders are used only in 18% of the projects procured (Bajari et al., 2009). Kelman (1990) also note that private firms do not use open competitive tenders as much as in public procurement. They also tend to leave higher margins to suppliers, change suppliers less often, and are more satisfied with the quality of goods and services.

[4] Chever et al. (2013) estimated that relative bids are lower on average by 13% when restricted auctions

in Italy suggest that award mechanism with more discretionary power given to the procurer does not necessarily lead to a higher number of bidders, nor more competitive bids (Coviello et al., 2013). If anything, Decarolis (2014) shows that open competitive tenders (in the form of first price auctions) result in more competitive bids. However, Decarolis (2014) also shows, using public procurement data in the city and county of Turin, that cost overruns are more important and delays are longer for projects that were awarded through the use of open competitive tenders.[5] Coviello et al. (2013) also found some evidence that delays are lower in contracts won by an incumbent contractor for projects awarded through more discretionary mechanism (restricted competitive tenders) in public work procurement in Italy. Therefore, limiting entry can improve *ex post* efficiency.

2.2 The dark-side of discretionary power in selecting contractors and institutional responses

One potential issue with restricted auctions and negotiation procedures is that they allocate a discretionary power to the public buyer, when selecting the firms invited to negotiate or to post an offer. This discretion may be used to improve economic efficiency by optimizing the relationships with firms. At the same time, it may also be detrimental to economic efficiency if it is used to to avoid competitive tenders for reasons of favoritism or corruption. Indeed, restricted auctions and negotiations can be regarded as a way to manipulate market attribution. It is not surprising that, according to a survey of 82 Norwegian exporters, the main purpose of bribe paying firms is to obtain a public contract through direct negotiations and without any call for tenders (Søreide, 2006).[6] Tran (2011) offers some compelling empirical evidence on how a larger scope of discretionary power granted to a public procurer can be abused using internal bribery records

are used, compared to open competitive tenders. In Chever and Moore (2013), relative bids, i.e. bids submitted over the engineers' estimated price of a project, are again found to be lower on average by 26% where there is a negotiation phase. They also show that these projects are less likely to be renegotiated *ex post*.

[5] According to his estimates, first price auctions increase the winning rebate by 13% of the winning bid, while cost overruns are higher by 6% of the reserve price and delays are longer by 26% for these projects (Decarolis, 2014).

[6] Note, however, that open competitive tenders (auctions) are to immune to corruption in itself, as shown by anecdotal evidence and in theory (Celentani and Ganuza, 2002; Burguet and Che, 2004; Compte et al., 2005). This can happen because even when open competitive tenders are used to select a contractor, the procurer may still have some discretionary power. This is the case when other dimensions of a good or service to be procured matter in addition to the price (e.g. quality).

of a firm participating in public procurement of a medical device in Vietnam. Analyzing more than 560 contracts concerned by bribes signed by one firm with its government buyers between 1997 and 2006, he found that procurement procedures matter. More precisely, open auctions are less concerned by corruption behaviors compared to direct negotiation and restricted auction procedures. His results also suggest that in addition with the auction procedure, criteria used in order to select the winner matters (i.e. best price vs. best economic offers) as well as the type of public authorities the company is contracting with (governmental agency vs. public companies).

While corruption and favoritism associated with more discretionary award procedure is an issue, their importance in public procurement should not be overly emphasized. Kelman (1990) pointed out that a lot of the inefficiencies in public organizations can be explained by strict rules and low degrees of discretion granted to bureaucrats, instead of favoritism or corruption. In a recent study, Bandiera et al. (2009) provide some empirical support into the idea that the main source of inefficiency in public procurement do not stem from "active waste" (i.e. corruption and favoritism). Bandiera et al. (2009), exploiting a policy change in public procurement in Italy, show that a lot of the inefficiency in the Italian procurement system for standard goods arise from a lack of expertise and skills by public procurement officials. According to their estimation, "active waste" accounts for 18% of the overall inefficiency. Similarly, in their study on restricted competitive tenders used by a social housing agency in France, Chever et al. (2013) argue that their empirical results are not consistent with the idea that discretionary power has been abused.

When will granting discretionary power to public procurers be an issue? To shed light on this question, we draw on the literature on the economics of corruption. A strand of this literature is interested in how the actual level of corruption is determined by institutions governing the corruptible bureaucracy bestowed with some discretionary power (Tirole, 1992; Laffont, 2001). To this end, the literature relies on a Principal-Agent framework, where a benevolent Principal (the government) is assumed to design institutions optimally to account for the potential abuse of discretionary power by a bureaucrat.[7] According to this line of thinking, the incidence of corruption will depend on the wage rate of the bureaucrat (efficiency wage),the monitoring system and legal remedies (i.e. punishment imposed on the agents for corruption).[8] Recognizing that

[7]See Aidt (2003) for a review.

[8]Empirically, cross-country comparison by van Rijckeghem and Weder (2001) suggests that corruption

fighting corruption is costly for society (because it involves paying higher wages to the bureaucrat), the main insight from this strand of literature is to show that it is optimal to tolerate corruption in some circumstances. More specifically, the extent to which corruption is (optimally) tolerated depends on the transaction costs related to corruption, i.e. the "contracting" cost incurred by the agents engaging in corruption to uphold the corruption deal. When transaction costs of corruption is low, corruption becomes more acceptable from the perspective of society (Aidt, 2003). The bureaucrat will find it attractive to engage in corruption. The benevolent principal will find it more costly to set up incentives to discourage the bureaucrat from engaging in corruption. Consequently, it will be optimal for society to tolerate corruption.

The main insights from this strand of literature therefore suggest that where institutions are strong, public procurer can be granted more discretionary power over mechanisms that they can use to select a partner and to award a contract. Indeed, strong institutional environment makes it more difficult for agents indulging in corruption to uphold their side contract because monitoring and legal remedies may be more efficient. In this case, transaction costs of corruption are high, and only deterring corruption need not be costly. By allowing the use of more discretionary award procedures when necessary, the selection mechanism may be tailored to the transaction at hand, thereby raising exchange surplus.

On the other hand, in weak institutional environments, monitoring and audits are less frequent, the judiciary system may not be efficient and laws are less likely to be enforced. Transaction costs of corruption are low, and corruption is more costly to deter through efficiency wages. Two cases may then arise: firstly, it may be optimal to curb discretionary power of the public procurer, by constraining them to use only selection mechanism that leaves a low degree of discretionary power such as open competitive tenders. This should be the case if such regulations are not costly to enforce, and prevent corruption from happening. However, if regulations that constrain the use of discretionary power are too costly to enforce, the only solution, consistently with the literature on the economics of corruption, is to tolerate corruption. In such an equilibrium, highly discretionary selection mechanism will be observed more frequently.

may be lower in the public sector when relative wages are higher. Di Tella and Schargrodsky (2003) and Olken (2007) provide some empirical support to the idea that more government audits and monitoring can help to reduce corruption.

This leads us to the following hypothesis:

Hypothesis 2. *Restricted competitive tenders and negotiations are more frequently used to select a contractor in strong institutional environment.*

Our discussion above suggests that there be a link between selection mechanism used in public procurement and the institutional environment. In the following, we empirically investigate the interrelation between the use of different selection mechanism and the quality of institutions using public procurement data from the EU. To this end, we will present the salient features public procurement in the EU.

3 Public procurement in the EU

3.1 The EU's legislative framework on public procurement

In 2011, governments, public sector and utilities in EU member states spent an estimated total of 2,405.89 billions of euros on public works, goods and services, which amounts to about 18% of the European GDP (EC Internal Market and Services, 2012)[9] This money was spent by a large and heterogeneous population of public authorities in Europe, possessing very different administrative capacities and budget sizes, on a wide variety of projects, and disbursed through a wide variety of procedures (European Commission, 2011).

Because public procurement involves the use of public funds, the conduct of public procurement is regulated in various European states. The fragmented and diversity of public entities and their procurement activities, and the desire to create a single market in the EU, have led European Institutions to legislate and regulate procurement activities in member states (European Commission, 2011). Since 2004, high value procurement activities of public entities in EU member states are subjected to two separate directives: the Directive 2004/18/EC which regulates the award procedures for public works, public supply and public service contracts, and the Directive 2004/17/EC which regulates the procurement activities of public entities operating in the water, energy, transport and

[9]Note that this figure overestimates purchases made by the public sector because, for instance, it includes the costs of health care and medical products reimbursed through statutory health insurance funds or governments.

postal sectors.[10] These rules are intended to impose common discipline on the conduct of public procurement, and were expected to transpose these directives into their national law by 2006. Generally, the new directives apply to public entities (excluding utilities) when they source goods and services whose estimated value lies beyond the threshold of 162,000 euros excluding VAT, and when they source for public works whose estimated value lies beyond 6,242,000 excluding of VAT (Directive 2004/18/EC).[11] According to EC Internal Market and Services (2012), these regulations cover about 18% of total expenditure by governments, public entities and utilities in 2011, or 3.4% of EU's GDP.

These EU Directives are intended to achieve two objectives. Firstly, they are meant to ensure transparency in public procurement by requiring public entities to publish notice and award of their procurement projects in the Official Journal of the European Union. Secondly, these directives are meant to ensure that interested suppliers are treated equally and without discrimination. This is achieved by establishing a menu of common procedures and by harmonizing technical specifications of the project.

EU public procurement regulations provide for a variety of procedures that public entities can use to award contracts or to source goods and services. Public entities are also allowed to award procurement contracts based on lowest price or the most economically advantageous offer criterion.

Procedures that public entities in the EU could use, as defined in the Directive 2004/EC/18, range from open and restricted procedures (basically open competitive tendering and restricted competition tendering) to negotiations with or without prior publication of contract notice, competitive dialog, framework agreement and dynamic acquisition systems. According to the directives, negotiated procedures refer to those procedures "*whereby the contracting authorities consult the economic operators of their choice and negotiate the terms of contract with one or more of these*"(paragraph 11(d) of article 1 in Directive 2004/EC/18). Negotiations is strictly regulated and is the exception more than the rule. Two types of negotiated procedures are defined in the Directive, distinguishing between the need to publish a prior contract notice or not (i.e., essentially, whether there is a call for competition or not).

[10]Before 2004, public procurement was regulated by Directives 92/50 relating to the coordination of procedures for the award of public service contracts, 93/36 coordinating procedures for the award of public supply contracts and 93/37 concerning the coordination of procedures for the award of public works contracts.

[11]A different threshold applies for certain public entities that are utilities. For utilities, the thresholds beyond which the EU Directive will apply are also different from the ones mentioned.

According to the Directive, the **negotiated procedure with prior publication** of a contract notice can be legally used in the event of irregular submissions, in cases where the risks of a project does not allow the public entity to price the project, when there is difficulty for the public entity to establish contract specification with sufficient precision and for works undertaken for purpose of research. The publication of the award notice implies that economic operators may express their interest to participate in the negotiations for the contract. According to article 30 of the Directive, the public entity must ensure equal treatment of the candidates when using this procedure. In law, these negotiations are meant to allow a public buyer to adapt tenders submitted by suppliers to the requirements set out in the contract notice or specifications, and to seek out the best tender (paragraph 2 of article 30 in the Directive). In a negotiated procedure with prior publication, the public entity must simultaneously and in writing invite selected candidates to negotiate, and specify in advance in this invitation the criteria[12] for the awarding of the contract (article 40 of the Directive). There is a legal requirement that the authority using this procedure negotiated with at least 3 candidates (paragraph 3 in article 44 of the Directive). In any case, the Directive requires that the public entity using this procedure to specify in advance the minimum number of candidates they intend to invite to negotiate the contract.

The use of the **negotiated procedure without prior publication** is also subjected to some specific regulations. In particular, this procedure can be used when the public entity did not obtained a tender or a suitable tender in a previous contract notice through a open or restricted procedure, in cases of extreme urgency and in cases where the contract can only be awarded to a particular economic operator because of technical or artistic reasons, or reasons related to the protection of exclusive rights (article 31 of Directive 2004/18/EC).[13] If such rules are followed, there should be few cases for which this procedure is used. Paradoxically perhaps, the Directive is relatively silent on legal requirements regulating the conduct of negotiated procedures without prior publication, at least from our reading of the Directive.

[12]Relative weights can be given to various criteria. When this is not the case, the regulation requires that the criteria should be listed in descending order of importance.

[13]Other circumstances when this procedure can be used include: (i) goods intended for the purpose of research; (ii) additional deliveries by the original supplier; (iii) supplies quoted and purchased on a commodity market; (iv) purchase of supplies on particularly advantageous terms because of liquidation; (v) when the public service contract follows a design contest; (vi) when there are additional works and services not included in the initial project due to unforeseen circumstances; and, (vii) new works or services which consists in the repetition of similar works and services.

3.2 The use of award procedures in the EU in practice

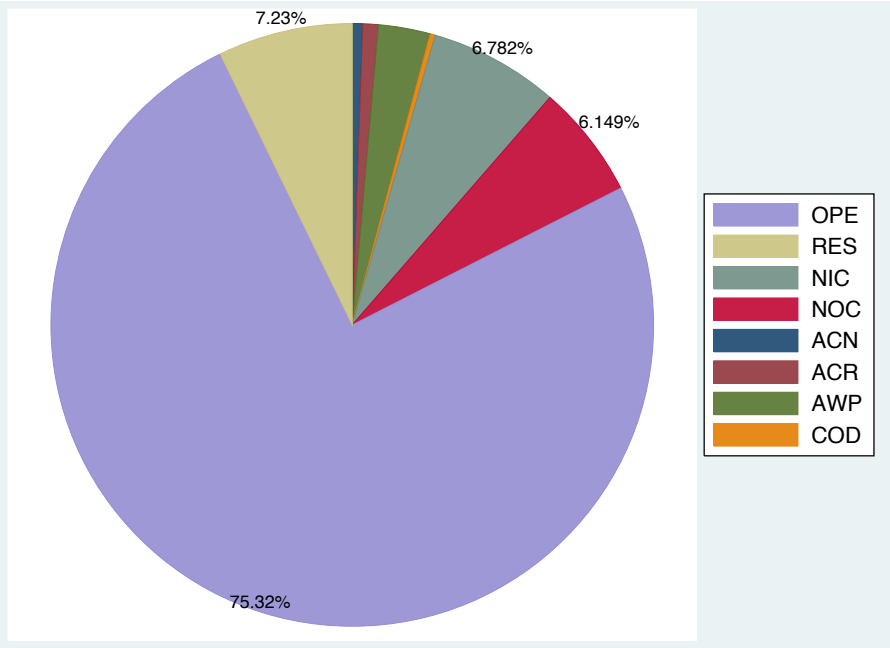
3.2.1 Overview

Figure 1 shows the share of procurement projects subjected to the EU directives that was awarded through different procedures provided under the EU regulations between 2008 and 2012, based on contract notice and award notice published in the Official Journal of the European Union (TED database). One can observe from this figure that a bulk of procurement projects subjected to EU regulations are awarded through open procedures and restricted procedures (about 82,5% of all procurement projects subjected to EU Directives).[14] Nevertheless, it is worthwhile to note that negotiation with prior publication and negotiation without prior publication are also used by public entities in the EU: they account for about 13% of all procurement projects awarded between 2008 and 2012. Furthermore, if we compute the share of these procedures in terms of value (figure 2), we can see that the share associated with restricted and negotiated procedures with prior publication becomes higher (resp. 25% and 12%). This suggests that relatively big projects in our sample are more often awarded using these two procedures rather than open procedures or negotiated procedures without prior publication. In terms of value, the use of negotiation without prior publication is comparatively low, at about 4.8%. This is expected since this procedure should be used only exceptionally.

The average procurement contract awarded through open procedure received about 5.6 offers and has a value of 2,005,722 euros, while the average value awarded through restricted procedure amounts to 11,200,278 euros, receiving on average 6 offers. The average contract awarded through negotiation with prior publication received slightly less offers (4.8) and is worth 6,838,688 euros. On average, it seems that while negotiated procedures with prior publication have been used for bigger projects, there may still be some competition among various economic operators if we assume that the number of offers received reflects the intensity of competition. In contrast, the average project awarded through negotiated procedures without prior publication is worth 2,188,461.88 euros, and received only 1.67 offers. In terms of number of offers, this suggests that negotiation-based procedures do not necessarily mean weak competition, it can depend on how negotiation is designed and organized. In particular, when there is a publication

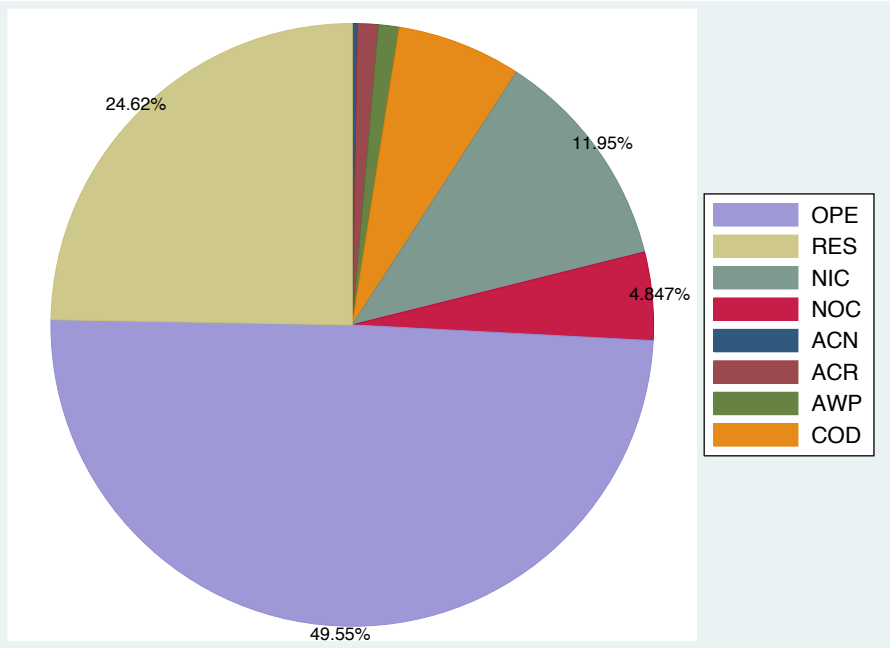
[14]The data distinguishes 8 types of award procedures (described in section 2.1), ranging from open procedures and restricted procedures to negotiated ones.

Figure 1: Share of award procedures used in the EU for procurement projects regulated by the EU directives in 2008-2012



Note: Authors' calculation based on 600,026 projects listed in TED. Legend: OPE = Open procedure; RES = Restricted procedure; NIC = Negotiated procedures with prior publication; NOC = Negotiated procedure without prior publication; ACN = Accelerated negotiation procedure; ACR = Accelerated restricted procedure; AWP = Award without prior notice; COD = Competitive dialog

Figure 2: Share of value of projects awarded through various procedures used in the EU for procurement projects regulated by the EU directives in 2008-2012



Note: Authors' calculation based on 520,143 projects listed in TED. Legend: OPE = Open procedure; RES = Restricted procedure; NIC = Negotiated procedures with prior publication; NOC = Negotiated procedure without prior publication; ACN = Accelerated negotiation procedure; ACR = Accelerated restricted procedure; AWP = Award without prior notice; COD = Competitive dialog

phase involved, the project may nevertheless attract some competition. Moreover, the difference in the average number offers received between the two negotiated procedures may also lead one to suspect that favoritism may be relatively easier when using the negotiated procedure without prior publication.

3.2.2 Country differences in the use of award procedures

The use of award procedures varies strongly across countries, as depicted in figure 3. In this figure, we will only focus on the four main award procedures used in the EU (open auctions, restricted auctions, negotiations with and without prior publication). Some interesting observations can be made from these figures. Firstly, and not surprisingly, the share of projects awarded through open procedure between 2008 and 2012 is high in all EU member states. The UK is, however, an exception to this general trend. In the UK, the use of open procedures is much lower than all other EU member states, to the benefit of restricted procedures. Countries also differ crucially in their use of the two types of negotiated procedures, despite strict rules in the Directive regulating the circumstances in which these procedures can be used. This suggests to us that countries may have some latitude in transposing the EU Directives into their national law, or that public entities in various countries may have some latitude over the procedures that they want to use to award public procurement contracts. Indeed, if the regulations on the use of these procedures can be used are respected, one can expect less variations across different countries.

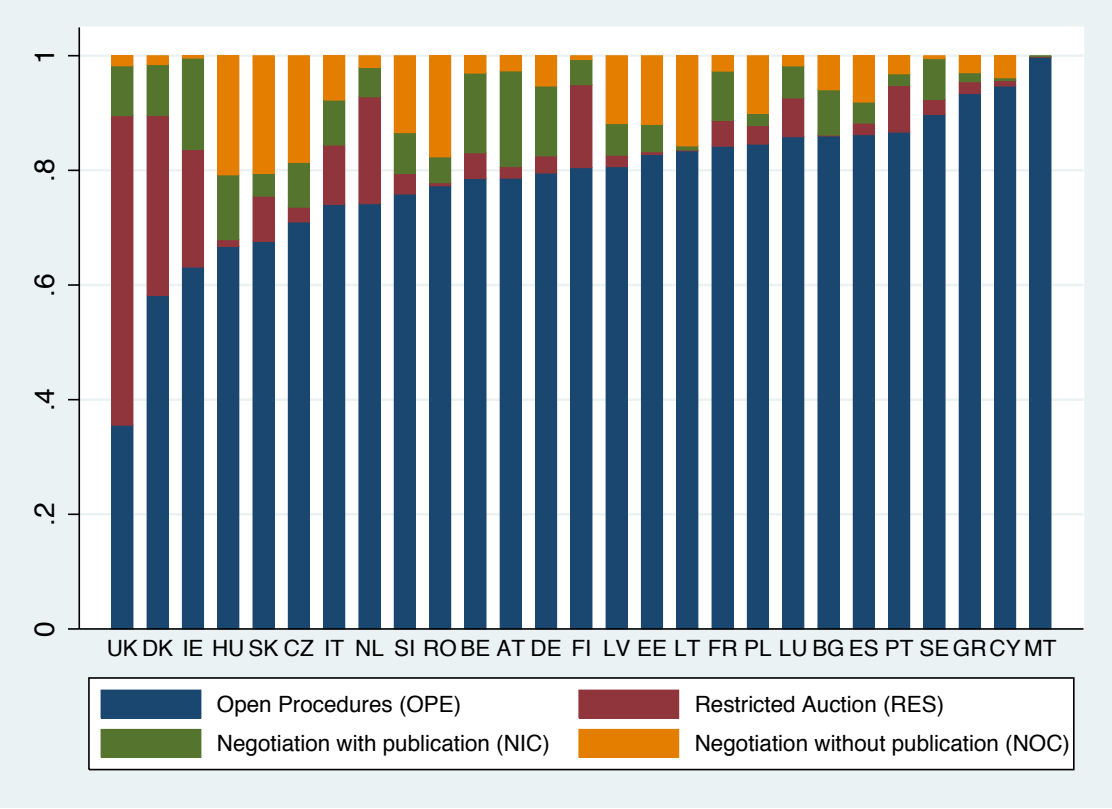
Our discussion and overview of public procurement procedures in the EU show that award procedures used the EU vary in degrees of discretionary power granted to the public agent. Moreover, in practice, we found substantial variation over the use of these procedures across member states. To explain the variation of these procedures, and based on existing literature reviewed in section 2, we expect that

- restricted auctions and negotiations with prior publication should be more likely used in strong institutional environments, where discretionary power is less likely to be abused because of high transaction costs of corruption.
- restricted auctions and negotiations with prior publication should be more likely used for complex projects.

- negotiations without prior publication, being an opaque selection mechanism should not be correlated with the quality of institutions.
- if it is costly to enforce regulations constraining the use less of discretionary award procedures, negotiations should be more likely used in weak institutional environments (because corruption is tolerated). If enforcement of regulations on award procedures is not costly, open auction should be more likely used in weak institutional environment.

In the following, we will describe our data and empirical methodology used to explore these hypotheses.

Figure 3: Share of projects awarded through the main procedures in the EU for procurement projects regulated by the EU directives in 2008-2012 in different countries



Note: Authors' calculation based on projects listed in TED.

4 Data and methodology

4.1 Data and sample

To explore the relationship between award procedures and institutional environment, we rely on public procurement data from the European Union. Our data set comprises public procurement projects published in the supplement to the Official Journal of the European Union between 2008 and 2012. These projects are electronically collected in the TED (Tenders Electronic Daily) data base.[15] All public procurement contracts that meet the thresholds shown in table 1 should be notified with TED. Moreover, our sample also contains procurement projects below these thresholds.

During our observational period, there are altogether 655,230 projects in the TED database. Among these 655,230 projects, there were 650,026 projects for which information on the award procedure used is available. Because of missing information on other variables that we use in our empirical analysis, and eliminating those projects that were not awarded through the four main types of procedure we consider here, our final sample comprises of 279,737 projects.[16]

Table 1: Threshold of projects published in the OJEU/TED (Source: TED, Business Opportunities in Europe or Commission Regulation (EU) no. 1251/2011)

Service & supply contracts	200 000 €
Public works	5 000 000 €
Supplies in the sector of water, energy and transport	400 000 €
Supplies in the telecom.	750 000 €
Contracts falling under GATT agreement	130 000 €

To be able to explore the link between procurement contract award and the quality of institutions, we need a quantitative measure of the quality of institutions. We rely on European Union's Quality of Government Index (EQI) at the regional level as our

[15] This data base is also used by the European Commission and Eurostat to measure public procurement activity in the EU.

[16] Note that the main loss in the number of observations that we experience is due to missing information on the project's value.

main measure on the institutional environment under which the procurement has taken place (Charron et al., 2012).[17] The index is constructed based on surveys of citizens, and hence, it measures the perception of the quality of institutions. The index is based on several dimensions: On the national level, there are 4 dimensions that are considered for the construction of the index: the control of corruption, the rule of law, government effectiveness, and voice and accountability. At the regional level, the index accounts for the quality, the impartiality and the corruption level of three services provided by regional governments: education, health care and law enforcement. The resulting index takes into account the quality of government both at the national and the regional level. This index was chosen over alternative existing indices because it provides a measurement of the quality of institutions not only at the national level, but also at the regional levels. As shown in Charron et al. (2013), there may be substantial variation in the quality of institutions across regions within a given country. We believe that such variation is useful in helping us identifying the effects on institutions on the use of award procedures. The index was constructed based on survey undertaken at the end of 2009. For each of the 365,649 procurement projects in our sample, we add the corresponding regional EQI and national EQI based on the geographic location of the procurement authority, using the NUTS code[18] of the procurement authority. This provides supplementary information on the institutional environment at the regional level where the procurement has been conducted.

Figure 4 shows that the quality of institutions, as perceived by citizens, vary across EU regions.

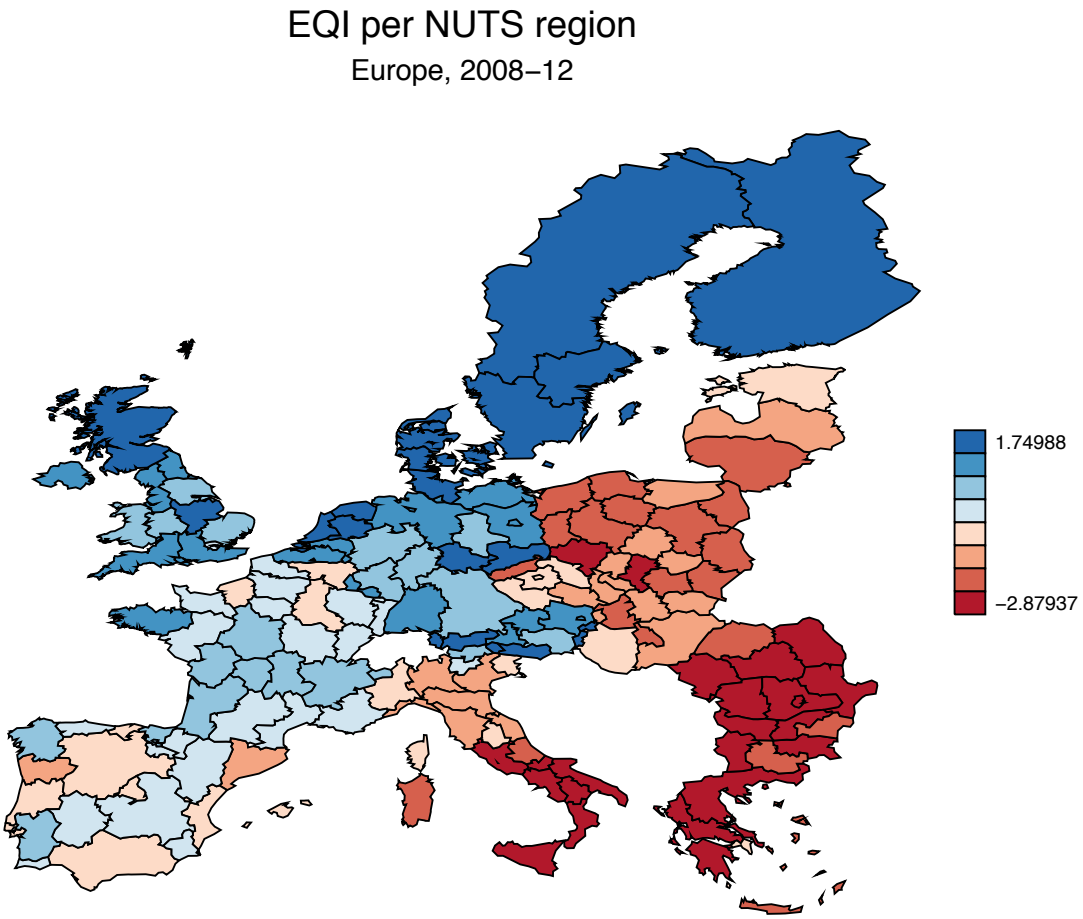
4.2 Empirical strategy

We are interested in knowing the way in which public sector selects a contractor and awards a contract is related to the quality of institutions. As discussed in section 2, alternative award mechanisms have their own strengths and weaknesses in dealing with different transactions (Goldberg, 1976; Guasch, 2004; Bajari et al., 2009, etc.). Based

[17] This index is available for download on the website of the Quality of Government Institute of the University of Gothenburg: `http://www.qog.pol.gu.se/data/datadownloads/qogeuregionaldata`.

[18] The NUTS code (Nomenclature of Units for Territorial Statistics) is a geographical referencing standard developed by the European Union. The nomenclature subdivides territories of the EU into regions at three different hierarchical levels (NUTS 1, 2 and 3 respectively), moving from larger to smaller territorial units. The NUTS classification need not correspond to a local administrative unit.

Figure 4: Quality of government across EU's region (NUTS-2) based on EQI regional index



Source: Adapted from Charron et al. (2013)

on efficiency considerations, characteristics of a transaction or a project may drive a public authority to use a particular type of procedure. This leads us to work with data at the project level. In other words, we will explore which factors drive a public procurer in to award a given project in a given year through open auction, restricted auction, negotiation with prior publication or negotiation without prior publications. In this setting, given that a public agent will be face with discrete choices, we choose to estimate a multinomial Logit model, using open auctions as our baseline comparison group.

Our main independent variable is the index of quality of government, EQI, measured at the regional level in the environment in which the procurement has taken place. Following Bajari et al. (2009), in some specifications, we also include the log value of a procurement project as a proxy for the complexity of a project.[19] We further control for the type of the project procured (using a classification based on the EU's common procurement vocabulary, or CPV codes), the type of public agent that has procured the project (federal government, local government, utilities), as well as year fixed effects and country fixed effects. In these regressions, standard errors are clustered at the country level.

To control for country fixed effects, instead of relying on the more traditional strategy of using dummy variables in our specifications, we opt for the Mundlak approach (Mundlak, 1978). In this approach, we first demean all our explanatory variables. In addition, the means of all our independent variables (at the country level) are introduced in the econometric specification. This approach can allow us to avoid the incidental parameter problem because of the limited observational period of our data.

Table 2 shows some descriptive statistics for the variables used in our regression analyses from our sample. As the table shows, the share of projects awarded through the three procedures that we consider here, namely open competitive tendering, negotiation with prior publication and negotiation without prior publication, are not too different from the whole sample of projects awarded between 2008 and 2012 listed in the TED database.

[19] Unfortunately, unlike Bajari et al. (2009), we do not have sufficient information on project duration, which could have served as a supplementary proxy for complexity.

Table 2: Descriptive statistics of variables used in our empirical analysis

Variable	Definition	N	Mean	Std Dev.	Min	Max
Open procedure	Takes value 1 when an open procedure is used to award a public procurement contract	279737	0.79	0.41	0.00	1.00
Restricted procedure	Takes value 1 when a restricted procedure is used to award a public procurement contract	279737	0.08	0.26	0.00	1.00
Nego w/ prior publication	Takes value 1 when a negotiated procedure with prior publication is used to award a public procurement contract	279737	0.06	0.24	0.00	1.00
Nego w/o prior publication	Takes value 1 when a negotiated procedure without prior publication is used to award a public procurement contract	279737	0.07	0.26	0.00	1.00
EQIregional	The EQI index of a region at the NUTS-2 level	279737	-0.04	0.98	-2.88	1.75
Value (log)	Logarithm of the value of a public procurement contract in euros (the contracted value that results from an award procedure)	279737	12.85	1.88	-4.61	23.43
CPVgroupx1 (Construction)	Takes value 1 if the procurement object concerns construction and works (CPV code is 45)	279737	0.21	0.41	0.00	1.00
CPVgroupx2 (Commodities)	Takes value 1 if the procurement object concerns commodities or food (CPV code is 03, 09, 14, 15, 24, 41 or 44)	279737	0.07	0.25	0.00	1.00
CPVgroupx3 (Manufactured goods)	Takes value 1 if the procurement object concerns manufactured goods (CPV code is 18, 19, 22, 37, 39 or 48)	279737	0.04	0.21	0.00	1.00
CPVgroupx4 (Equipment)	Takes value 1 if the procurement object concerns equipment or machinery (CPV code is 16, 30, 31, 32, 33, 34, 35, 38, 42 or 43)	279737	0.22	0.42	0.00	1.00
CPVgroupx5 (Business services)	Takes value 1 if the procurement object concerns business services (CPV code is 70, 71, 72, 73 or 79)	279737	0.15	0.36	0.00	1.00
CPVgroupx6 (Other services)	Takes value 1 if the procurement object concerns services with the exception of business services (CPV code is 50, 51, 55, 60, 63, 64, 65, 75, 76, 77, 80, 85, 90, 92 or 98)	279737	0.23	0.42	0.00	1.00
CPVgroupx7 (Others)	Takes value 1 if the procurement object does not concern one of the previous categories	279737	0.07	0.26	0.00	1.00

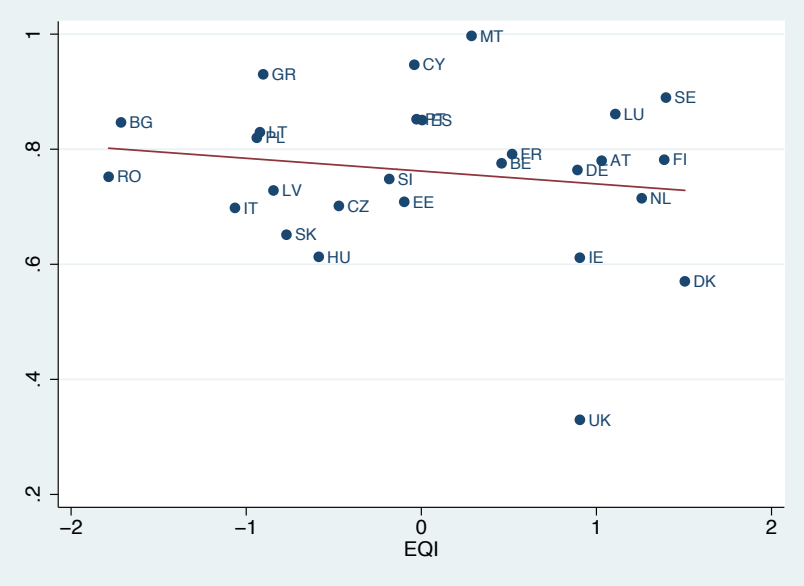
Variable	Definition	N	Mean	Std Dev.	Min	Max
authoritygroupx1 (Federal)	Takes value 1 if the procuring agent is a public entity at the federal or central level	279737	0.11	0.31	0.00	1.00
authoritygroupx2 (Local)	Takes value 1 if the procuring agent is a public entity at the local or sub-national level	279737	0.37	0.48	0.00	1.00
authoritygroupx3 (Utilities)	Takes value 1 if the procuring agent is a utility	279737	0.09	0.28	0.00	1.00
authoritygroupx4 (Others)	Takes value 1 if the procuring agent is a public entity who does not belong to any previous categories (e.g., international organizations etc.)	279737	0.43	0.49	0.00	1.00

5 Empirical results

5.1 Some preliminary evidence

Figures 5 to 8 show the share of procurement projects subject to the EU Directives in each member state awarded through open procedures and negotiated procedures with and without prior publication. In these figures, the x-axis corresponds to a country's quality of government index measured with the EU Quality of Government Index, or EQI (Charron et al., 2012, 2013, etc.). A higher value corresponds to a higher government quality, or a better institutional environment.

Figure 5: Share of open tenders and EQI

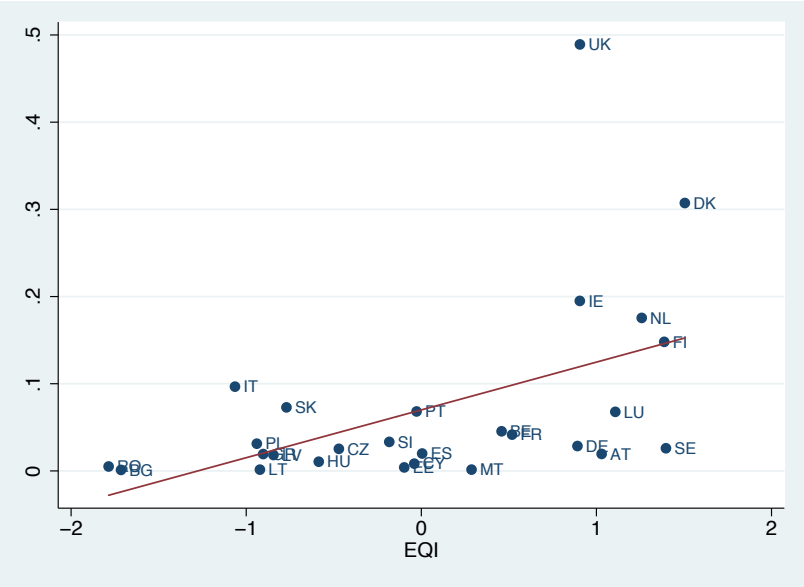


Note: Authors' calculation based on 600,026 projects listed in TED.

It is interesting to note that there seems to be a slight negative correlation between the use of open procedures and a country's EQI (about -0.16), but this negative correlation seems to be driven more by the particular case of the UK which relies relatively less on open procedures to award projects in 2008-2012.

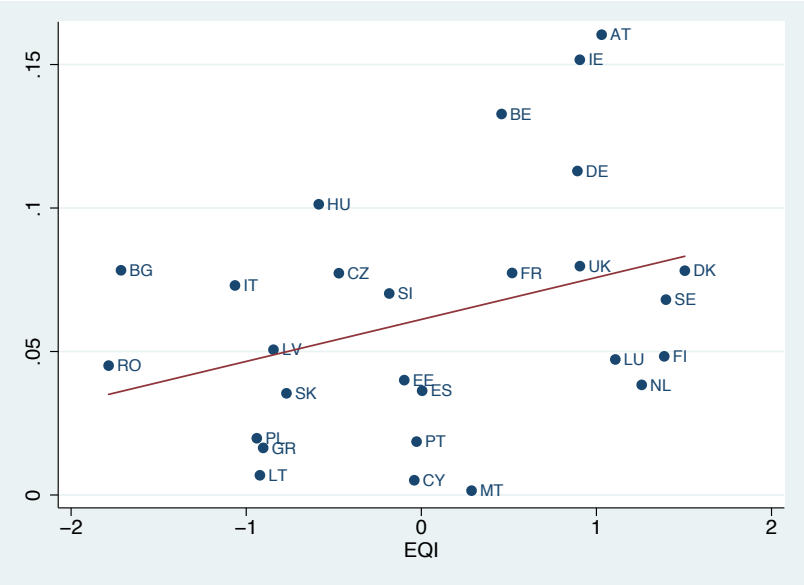
Figures 7 and 8 shows that the use of the negotiated procedures varies across EU member states between 2008 and 2012. While figure 7 suggests a positive correlation

Figure 6: Share of restricted tenders and EQI



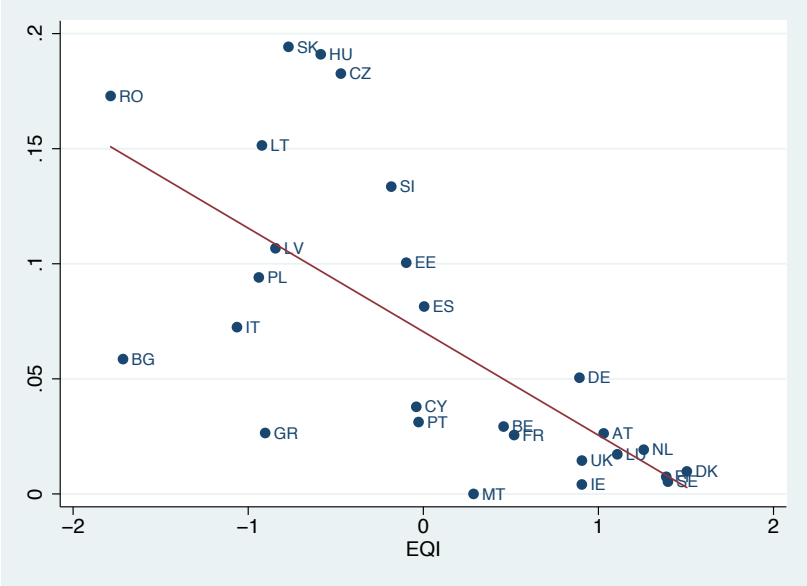
Note: Authors' calculation based on 600,026 projects listed in TED.

Figure 7: Share of negotiated procedures with prior publication and EQI



Note: Authors' calculation based on 600,026 projects listed in TED.

Figure 8: Share of negotiation without prior publication and EQI



Note: Authors' calculation based on 600,026 projects listed in TED.

between the use of negotiated procedure with prior publication and a country's quality of governance, figure 8 points rather to a negative correlation between the share of procurement project awarded through negotiated procedure without prior publication and a country's EQI. The correlation in the former case is also stronger in absolute terms (about -0.68) in comparison with the latter case (about 0.33). It would therefore seem that countries with a lower quality of government, as measured by the EQI index, are more often associated with a higher use of negotiated procedures without publication. On the other hand, it would seem that countries with higher EQI are also the ones that tend to rely more on publicizing their projects when they wish to rely on negotiations.

On the overall, it seems that the use of more discretionary procedures are correlated with the quality of institutions. At the country level, public entities in weaker institutional environment seems to rely on more negotiated procedures without prior publication. The share of projects awarded through the more transparent award procedures (restricted auctions, negotiations with prior publication) also seems to be more important in countries where institutions are perceived to be stronger, consistent with our expectations. We explore these links in more details in what follows.

5.2 The choice of award procedures: Estimations at the project level

To ascertain the association between the quality of institutions and the likelihood of using one of the four main award procedures considered, it is important to control for characteristics of the project and of the buyer by estimating a multinomial logistic model. We show estimation results for two different specifications in table 3. In column (2) table 3, we take into account country fixed effects using the Mundlak approach (Mundlak, 1978) in order to account for unobserved and time invariant country heterogeneity, while this is not the case for results shown in (1) in able 3. The baseline comparison group for these estimations is open auctions. Standard errors shown in the table are robust and clustered at the country level.

A first observation that can be made from table 3 concerns the estimated coefficient of the value of a project. Our results suggest that, compared to open auctions, the relative probability that projects with a higher value are awarded through restricted auctions and negotiations with competition are higher. This effect is significant, whether we control for country fixed effects (column (2)) or not (column (1)). To the extent that the value of a project is an acceptable proxy for project complexity, as suggested in the existing empirical literature, we can interpret our observation as some support for the fact more discretionary award procedures are likely to be used to award more complex projects. This is consistent with recent developments on this issue.

Our results also show that project with a higher value are also less likely to be awarded through negotiations without competition, as compared to open auctions. Again, the estimated coefficient is statistically significant at the usual threshold. This suggests that, on the overall, smaller projects are more likely to be awarded using this procedure compared to open auctions. Nevertheless, we should also bear in mind that projects are still large projects, since these are essentially projects that met the EU thresholds on public procurement regulations.

Turning to the link between the quality of institutions and various award procedures, we find that restricted auctions and negotiations with competition are more likely to be used in strong institutional environment (column (1)), as compared to open auctions. This suggests that in strong institutional environment, public buyers may enjoy more flexibility in how they choose to select their contractors in order to procure efficiently. This provides some support to our hypothesis. However, we also note that this correla-

tion is not robust to country fixed effects. The coefficient for these two variables loses significance once we control for country fixed effects (column (2)). This suggests that the effects observed in column (1) may be driven largely by cross-country differences in the quality of institutions.

On the other hand, our results depicts a robust negative correlation between the use of negotiations without competition and the institutional environment. In particular, results show that in strong institutional environment, negotiations without competition are more likely to be used compared to open auctions. The prevalence of this procedure in weak institutional environments may suggest potential abuse of discretionary power, as suggested by our review of the theoretical literature.

Figure 9 graphs the probability of observing each of the 4 award procedures according to different values of our measure of the quality of institutions. These corresponds to the marginal effects of EQI based on the estimation results of column (2) in table 3. The figure shows that, controlling for country fixed effects, the probabilities of using restricted auctions and negotiations with competition are relatively stable across different values of EQI. Interestingly, when EQI is low, there is a higher likelihood that a project is awarded through negotiation without competition, at the expense of open auctions. For higher values of EQI, the probability of using negotiation without competition is almost not distinguishable from the probability of using restricted auctions, or that of using negotiations with competition.

Table 3: Estimation results of the choice of award procedures (multinomial logistic model)

	(1)			(2)		
	Rest. auct.	Nego. w/ comp.	Nego. w/o comp.	Rest. auct.	Nego. w/ comp.	Nego. w/o comp.
EQIregional	0.847**	0.565***	-0.459***	-0.064	-0.151	-0.331***
	(0.370)	(0.210)	(0.125)	(0.112)	(0.177)	(0.090)
lnvalue	0.334***	0.126*	-0.170***	0.195***	0.158**	-0.182***
	(0.044)	(0.067)	(0.064)	(0.062)	(0.073)	(0.063)

Baseline comparison group: Open auctions. Robust clustered standard errors in parentheses

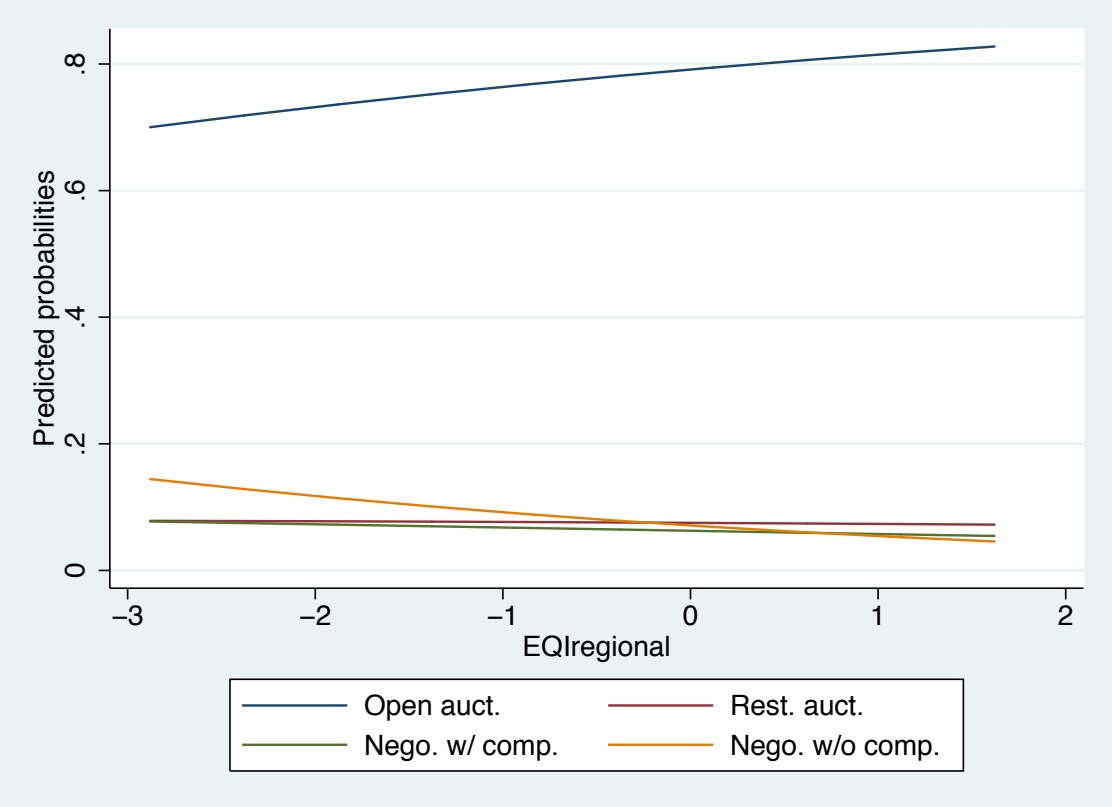
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	(1)			(2)		
	Rest. auct.	Nego. w/ comp.	Nego. w/o comp.	Rest. auct.	Nego. w/ comp.	Nego. w/o comp.
CPVgroupx2	-0.187	-0.269	0.193	-1.105***	-0.018	0.169
	(0.337)	(0.395)	(0.521)	(0.429)	(0.446)	(0.593)
CPVgroupx3	0.690	0.189	0.341	-0.266	0.379	0.365
	(0.423)	(0.404)	(0.549)	(0.374)	(0.467)	(0.637)
CPVgroupx4	0.204	0.062	0.109	-0.738*	0.291	0.146
	(0.398)	(0.430)	(0.658)	(0.409)	(0.495)	(0.737)
CPVgroupx5	1.334***	1.565*	1.076*	0.662	1.912**	1.064
	(0.401)	(0.833)	(0.550)	(0.416)	(0.949)	(0.652)
CPVgroupx6	0.878**	0.677	0.649	-0.219	1.066**	0.717
	(0.400)	(0.423)	(0.527)	(0.351)	(0.535)	(0.601)
CPVgroupx7	0.934**	1.155**	0.015	-0.126	1.480**	0.025
	(0.410)	(0.552)	(0.487)	(0.364)	(0.645)	(0.584)
authoritygroupx2	-0.320	-0.269*	-0.721**	-0.557***	-0.124	-0.477**
	(0.219)	(0.153)	(0.280)	(0.170)	(0.136)	(0.235)
authoritygroupx3	0.531*	3.002***	0.669**	0.405	3.403***	0.865***
	(0.310)	(0.398)	(0.298)	(0.412)	(0.358)	(0.314)
authoritygroupx4	0.035	-0.026	-0.564***	-0.051	0.136	-0.349*
	(0.179)	(0.162)	(0.160)	(0.130)	(0.121)	(0.193)
_cons	-7.372***	-5.332***	-0.044	-18.727	-131.041***	-63.617***
	(0.880)	(1.322)	(1.191)	(23.870)	(38.006)	(10.904)
Country FE		No			Yes	
Year FE		Yes			Yes	
Pseudo R^2		0.1454			0.2486	
Log likelihood		-177372.8			-155956.3	
N		279737			279737	

Baseline comparison group: Open auctions. Robust clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 9: Probabilities of choosing each award procedures according to EQI (Marginal effects estimations based on column (2) of table 3)



Lastly, it is interesting to note that utilities are more likely than central government agencies to rely on negotiation with competition and negotiations without competition to select contractors rather than using open auctions. This relative probability of using negotiations with competition over open auctions is more important for this group of public buyers. In contrast, our estimation also shows that local government buyers are more reluctant to negotiate contract without any competition (as compared to using open auctions) with contractors than federal government buyers.

To gain further insight how discretionary power associated with these award procedures are used, it can be useful also to take into account the contract award criteria, which can be more flexible or more rigid (lowest price, for instance). In the following subsection, we turn our attention to this issue.

5.3 Accounting for the choice of award criteria

Notwithstanding the issue over award procedures in public procurement, public entities procuring goods and services also specify the criteria that they will use to choose a supplier. The EU Directives allow public entities to award contracts based on two broad types of criteria: lowest price or the most economically advantageous offer. In their publication or call for tender for a project, EU regulation requires public entities to announce these criteria. Even if the Directives defines what criteria can be used to select suppliers or offers, a public entity appealing to the most economically advantageous offer as a means to select supplier can have more discretionary power and has more flexibility than when the lowest price criteria is used. For a given award procedure, it may be important to distinguish between the broad families of criteria used to select a supplier. In other words, an open procedure based on lowest price can be less discretionary and less flexible for a public entity than an open procedure based on the most economically advantageous offer.

During our observational period, the lowest price criteria is used in 37% of cases.[20] This means that public entities in the EU do not consider only the price to choose their suppliers. Table 4 shows the prevalence of the two families of award criteria for projects awarded through the 4 main procedures in the EU for our data. As the table shows, only about 38% of all projects awarded using open procedures used the lowest price criteria. The majority of these projects are in fact awarded based on considerations beyond price. A similar observation may be made for projects awarded through restricted procedures and negotiated procedures with prior publication. Nevertheless, for these projects, there is a higher reliance on the most economically advantageous criteria than for projects awarded through open procedures. To the extent that restricted and negotiated procedures are used to award more complex projects, a strong reliance on the most economically advantageous offer criteria can be expected. Interestingly, the exception to this general trend are projects awarded through negotiated procedures without prior publication. Indeed according to table 4, the bulk of projects awarded through this procedure relied on the lowest price criteria (65% of all projects awarded through this procedure). If one were to argue that this procedure is more adapted for complex projects, then one is left wondering why only public entities using this procedure choose

[20] Based on 601,491 projects in TED for which we have information on the award criteria used to choose suppliers.

their final offer and supplier based only on prices.

Table 4: Award criteria and award procedures

Award procedure	Lowest Price	Most Economic
Open procedures	38.23%	65.37%
Restricted procedures	20.57%	79.43%
Nego. w/ prior publication	20.84%	79.16%
Nego. w/o prior publication	65.38%	34,62%

To investigate the choice of award criteria and procurement procedure simultaneously, we run a multinomial Logit model regressing the respective combination of procurement procedure and award criteria on our set of explanatory variables. Given 4 procedures and 2 award criteria we end up distinguishing 8 groups of procedure-criteria combinations (see Table 4). As the discretionary leeway of the award process is central to our analysis we use open auctions with lowed price as the baseline comparison group. Arguably, this is the most rigid award and criteria choice compared to all other choices. All the obtained coefficients consequently have to be interpreted as the contrast of a given procedure-criteria combination to open auctions with lowest price.

The results of the multinomial Logit model are exhibited in Table 5. A first glance at Table 5 reveals that a large part of the difference in procurement procedures to our baseline procedure (open auction with lowest price) is driven by the award criteria. For restricted auctions and negotiations with prior publication, the coefficient of EQI is substantially higher and statistically significant in the case of the most economic offer criteria. This suggests that regardless of the two procedures, a higher EQI leads to an increased use of the more flexible most economic offer criteria. Along the same lines, higher contract values are more often associated with the most economic offer criteria awarded through restricted auctions or negotiations with prior publication.

In detail the results show that a higher EQI is associated with statistically significant more awards using the most economic offer criteria for open auctions, restricted auctions and also negotiations. In contrast, a higher EQI is associated with less negotiated procedures using the lowest price criteria when compared with the base category, open auctions with lowest price. Moreover, for a higher EQI we would expect more restricted

auctions and negotiations with call for competition relative to open auctions with lowest price. Negotiations without competition and lowest price have the opposite association, i.e. are used less than open auctions with lowest price for higher values of EQI.

Table 5: The choice of award procedure and criteria (without country fixed effects)

	Open Auction	Restricted Auction		Negotiation		Negotiation w/o comp.	
	(ME)	(LP)	(ME)	(LP)	(ME)	(LP)	(ME)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
EQIregional	0.650**	0.420	1.676***	-0.086	1.309***	-0.416***	0.258
	(0.305)	(0.274)	(0.534)	(0.154)	(0.289)	(0.086)	(0.178)
lnvalue	0.147***	0.322***	0.476***	0.038	0.276***	-0.133*	-0.119
	(0.041)	(0.046)	(0.058)	(0.091)	(0.062)	(0.072)	(0.079)
CPVgroupx2	0.242	-0.533	0.125	-0.370	-0.070	0.295	0.082
	(0.207)	(0.394)	(0.446)	(0.461)	(0.422)	(0.486)	(0.958)
CPVgroupx3	1.103***	0.197	1.798***	-0.287	1.250**	0.600	0.959
	(0.239)	(0.485)	(0.485)	(0.500)	(0.501)	(0.601)	(0.978)
CPVgroupx4	0.956***	-0.232	1.197**	-0.354	0.992*	0.155	0.778
	(0.263)	(0.558)	(0.490)	(0.491)	(0.561)	(0.710)	(1.079)
CPVgroupx5	1.578***	1.062**	2.865***	0.864	3.061***	1.606**	1.944*
	(0.342)	(0.476)	(0.552)	(0.640)	(1.012)	(0.675)	(1.049)
CPVgroupx6	1.141***	0.706*	1.939***	0.366	1.738***	1.022*	1.162
	(0.272)	(0.421)	(0.508)	(0.413)	(0.558)	(0.529)	(0.940)
CPVgroupx7	0.703**	0.200	1.759***	0.779	1.860**	0.216	0.380
	(0.351)	(0.551)	(0.563)	(0.668)	(0.741)	(0.597)	(1.037)
authoritygroupx2	0.387***	-0.555**	0.194	-0.599**	0.232	-0.775***	-0.154
	(0.148)	(0.233)	(0.291)	(0.256)	(0.167)	(0.227)	(0.298)
authoritygroupx3	-0.367	0.596***	0.045	2.319***	2.959***	0.234	1.288**
	(0.303)	(0.212)	(0.374)	(0.510)	(0.437)	(0.306)	(0.614)
authoritygroupx4	0.320**	-0.324*	0.543**	-0.521	0.459**	-0.439***	-0.198
	(0.138)	(0.182)	(0.227)	(0.327)	(0.188)	(0.144)	(0.261)
_cons	-2.065***	-6.775***	-9.573***	-3.877**	-7.475***	-0.211	-1.317
	(0.772)	(1.118)	(1.103)	(1.596)	(1.424)	(1.349)	(1.725)
Year FE	Yes						
Country FE	No						

Baseline comparison group: Open auctions with lowest price criteria.

Robust clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

	Open Auction	Restricted Auction		Negotiation		Negotiation w/o comp.	
	(ME)	(LP)	(ME)	(LP)	(ME)	(LP)	(ME)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Pseudo R^2	0.1393						
Log likelihood	-315093.4						
N	266748						

Baseline comparison group: Open auctions with lowest price criteria.

Robust clustered standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To conclude, taking into account the award criteria in addition to the procurement procedure appears to be important. Countries with a higher EQI use substantially more flexible award criteria instead of lowest price. Although the above regressions do not tell us whether these are deliberate choices by the public buyers or mandated by the country specific regulation, the differences in itself are very important. They show that the procurement design varies substantially between countries with different degrees of institutional quality. Interestingly, the negotiated procedure without competition, especially with a lowest price criteria, is more often chosen by public buyers in more corrupt environments. This observation suggests that these procedures are likely to be abused, and is consistent with Søreide (2006) and Tran (2011). Indeed, if this very discretionary procedure is used for very complex projects, it is likely that the contractor should be chosen taking into consideration a variety of dimensions, i.e. based on the most economically advantageous criteria. Nonetheless, a further and more detailed investigation is called for at this stage of the analysis.

6 Concluding remarks

In this paper, we investigated how the use of award procedures for public procurement contracts, such as open auctions, restricted auctions and negotiations, are related with the quality of governance. Previous literature suggests that there is no one mode of awarding contracts that is more efficient than all alternatives. While competitive tenders stimulates competition, which is beneficial to the procurer, it also stifles communication. Negotiations may then outperform open competitive tenders, especially for complex transactions because contracting parties can exchange pre-contract infor-

mation. (Goldberg, 1976; Bajari et al., 2009, etc.). However, the discretion associated with negotiation is often supposed to provide room for corruption and favoritism. We investigated the idea that the quality of the institutional framework is crucial in order to understand the award procedures put in place in one country. More precisely, we argue that good institutions by reducing the probability of corruption behaviors, open the room for flexible award procedures as soon as transactions are complex.

We empirically explored this idea using a European data set containing information concerning public procurement in the 27 European countries, over the 2008-2012, and completed with information on the quality of government at the regional level. Our analysis shows that the use of negotiated procedures is consistently and positively correlated with the complexity of the transactions. More importantly, our results also show that the use of negotiated procedures without call for competition is consistently and negatively correlated with a region's institutional environment. In other words, public entities in institutional weaker regions and countries—where corruption may be more widespread—tend to rely more on this procedure to award public contracts. On the other hand, while we find some evidence that restricted auctions and negotiation with competition are more used in strong institutional environment, the association is not robust to country fixed-effects.

Our results point out the importance of designing suitable selection mechanism to award contracts. More complex projects, associated with contracts that are more difficult to specify *ex ante* and/or to enforce *ex post*, should be awarded through more flexible mechanisms such as negotiations. This consideration should also take into account the quality of institutions and the risks of corruption.

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