Corruption and Incompetence in Public Procurement

Antonio Estache
SBS-EM, ECARES, Université libre de Bruxelles

Renaud Foucart
Humboldt University

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Antonio Estache†        Renaud Foucart‡

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Abstract

We study a game where inefficiencies in public procurement managed by politicians come from two sources: corruption (moral hazard) and incompetence (adverse selection). We characterize the respective impact of judicial and accounting courts on the cost effectiveness of procurement and the level of corruption. Although improving the quality of both courts matters as a direct deterrent of corruption, it may also indirectly decrease the quality of the pool of politicians and hence deteriorates the cost efficiency of procurement.

Keywords: moral hazard, adverse selection, procurement

JEL: D72, H57, L3

1 Introduction

When public sector services costs more than they should, it is hard for voters to know if it is due to the corruption, to the incompetence or simply to the bad luck of the politician running the procurement process needed to ensure the delivery of the services. If the higher than needed cost reflects rents extracted by a competent but corrupt politician, the issue is moral hazard. If the poor cost performance is linked to the poor skills of the politician, the voter is facing an adverse selection problem since it is hard to rank politicians in terms of their skill levels with the information easily available.

For voters, in an environment in which they are concerned with corruption and increasing costs, assessing the skills and honesty of politicians is particularly difficult because any politician

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†ECARES, Université libre de Bruxelles (aestache@ulb.ac.be)

‡Humboldt University, Berlin (renaud.foucart@hu-berlin.de)
delivering a project at high cost has a strong incentive to always claim unfavorable circumstances (bad luck) rather than admit corruption or incompetence. When bad luck cannot be blamed, the least scrupulous politicians can use this confusion to claim to be incompetent rather than corrupt. This is likely to be a reasonable strategy in environments in which the voters tend to distrust politicians.\textsuperscript{1} The anecdotal evidence seems to confirm the reliance on this strategy in a number of high profile incidents.\textsuperscript{2}

In most countries, judges representing the judicial system are expected to mitigate the moral hazard problem associated with corruption. Their role is to assess whether a political appointee responsible to decide on public service providers has been subject to corruption or bribery. The adverse selection problem linked to skills biases is expected to be mitigated by the diagnostics of independent public sector auditors who tend to be experts in the field they are mandated to audit within clear limits.\textsuperscript{3} We label these auditors “accounting courts”.\textsuperscript{4}

These two types of courts have in common that they cannot act independently on their findings. A judge uses the information provided by an accounting court to determine which cases to investigate and has to rely on cost assessments published by the accounting court. The auditors are not allowed to condemn a politician on the sole fact of her cost inefficiency and need to rely on the judicial system to address any evidence on cost or process abuses and corruption. We therefore assume that a politician can be convicted if and only if her project is reported at high cost and she is found guilty of corruption.

\textsuperscript{1}The idea that corruption is a problem is quite widespread in Europe. According to Eurobarometer 2014, 56% of Europeans believe that bribery and the abuse of positions of power for personal gain are widespread among politicians at national, regional or local level. A 2015 Ipsos MORI survey in the UK shows that the British public is less likely to trust politicians to tell the truth than estate agents, bankers and journalists. Just 16% of Britons trust politicians to tell the truth compared with 22% trusting journalists and estate agents and 31% who trust bankers (https://www.ipsos-mori.com/researchpublications/researcharchive/3504/Politicians-trusted-less-than-estate-agents-bankers-and-journalists.aspx).

\textsuperscript{2}In the US, Kwame Kilpatrick, the former mayor of Detroit, managed to be reelected for a second term in 2005 in spite of public evidence of spending above $200,000 of public money in private dining and wine. He eventually was convicted of corruption. In 2015, in Brazil, judges found that procurement processes operated by Petrobras, the state oil company, had been used to finance the political party in power as well as to allow some politicians to enrich themselves. The case is still on court. In France, former president J. Chirac was convicted in 2012 for having used civil servants under his authority to work for his political campaign. He had argued that since he did not get private enrichment, he was doing nothing illegal. In 2012, a Belgian local conservative politician, A. Courtois, mismanaged a public procurement contract, which was awarded to a company he is affiliated with. When journalists started to cover this fact, he organized a press conference to argue that it was involuntary that the bid had only been open to his own company and the discussion did not go any further. In Bel et al. (2013), we provide additional illustrations from Spain, ranked among the most corrupt countries in Europe in the 2015 Transparency International Annual report.

\textsuperscript{3}For instance, government Accountability Office for the US federal government, National Audit Office in the UK, Court des Comptes in France or Belgium, Tribunal de Cuentas in Spain, ...

\textsuperscript{4}Their specific mandates and expertise can vary across countries but their core auditing function is equivalent. For instance, the Spanish auditing institution tends to focus only on the compliance with the legal commitments of decisions while the French auditing institution conducts diagnostics that go well beyond the legal dimensions and include robust assessments of the fiscal, financial, economic and social impacts of many decisions.
We analyze the respective influence of the quality of the judicial system and the accounting courts on the cost efficiency of public procurement. We define a court quality by the precision of its assessment. An accounting court is only able to observe the cost efficiency of a project imperfectly. A judicial court is only able to observe the honesty of a politician imperfectly.

A basic intuition is that the higher the quality, the lower the risk of excessive costs resulting from the procurement process. The main purpose of this paper is to assess the robustness of this intuition.

We find that, indeed, the direct effect of both institutions is to decrease the probability of corruption. However, we also identify an indirect and possibly detrimental effect: the influence of the quality of a court on the incentives to become a politician. A better judicial system may decrease the quality of the pool of applicants. This is because better judges, by managing to better separate incompetent from corrupt politicians, may make politics more attractive to the least competent politicians by decreasing the probability of being wrongfully convicted for corruption. This reinforces the fact that the least competent politicians have a lower opportunity cost of being in office and hence their best option is to be in politics. Better accounting courts can also decrease the quality of the pool of applicants when they make the profession of politicians more (when only the very best apply), or less (when only the least able apply) attractive to politicians with average ability. When the negative indirect effect outweighs the direct effect on corruption, courts of higher quality may actually decrease the cost efficiency of procurement.

We then characterize an “ideal” institutional design that minimizes the expected cost of the projects, the level of corruption and the cases of wrongful convictions. It implies sufficiently good accounting courts, sufficiently bad judicial courts, and a high punishment for those convicted of corruption. It also implies a sufficiently high wage for the most able politicians to enter, but not high enough for the less able to be willing to take the risk of being convicted. We further derive local conditions for a marginal increase in the quality of the judicial and accounting courts, in the wages of politicians and in the punishment of those convicted of corruption to decrease the expected cost of procurement. For instance, it can be locally beneficial to decrease the wages of politicians when the most able apply but the pool of applicants is too broad. It can also be beneficial to increase the quality of the judicial court when the main driver of high costs is corruption and not incompetence.

To reach those conclusions, we make two assumptions in our modeling that rule out trivial solutions. First, we rule out the fact that some politicians are genuinely honest and derive no utility from bribes. Introducing exogenously honest politicians would decrease the importance of
the moral hazard problem. Second, we assume that each politician choosing to enter the pool of applicants for the job of managing a procurement project is selected with equal probability, implying that voters cannot screen based on skills. We show in Section 5 that assuming voters screen the most able candidates would mechanically decrease the importance of the selection problem.\(^5\) There is however a large body of evidence that voters do not thoroughly assess the competence of politicians before making their choice. For instance, Todorov \textit{et al.} (2005) show that “inferences of competence, based solely on the facial appearance of political candidates and with no prior knowledge about the person, predict the outcomes of elections for the U.S. Congress even after voters were given the possibility to correct their vote after receiving additional information on politicians’ competence.”\(^6\)

Our contribution looks into institutional failures that allow bad and corrupt politicians to improve their career prospects, and therefore deteriorate the cost efficiency of public projects. The core relevance of corruption for the optimal design of procurement has already been discussed by Søreide (2002), Compte \textit{et al.} (2005), Auriol (2006), and Estache (2011) for instance. More recently, the concerns for corruption in procurement have made it to mainstream policy debates.\(^7\) An important question in recent debates has been to understand how corruption in public procurement affects the quality of entrepreneurs applying for these contracts (Auriol \textit{et al.}, 2016). We take the opposite approach of studying the impact on the quality of politicians. Early attempts to study the endogenous quality of the pool of politicians go back to Besley and Coate (1997) and Besley and Coate (1998).\(^8\) Our model relates even more closely to Caselli and Morelli (2004), who study the endogenous pool of politicians in the presence of heterogeneous ability and corruption. While we share with this paper the assumption that the most able politicians have the highest opportunity cost of holding office, our approach differs in several dimensions. On the one hand, we do not model the reputation externalities of politicians on each other. On the other hand, we explicitly model the influence of judicial and accounting courts on the incentive to accept bribes and enter politics.

Our main interest is to know how institutions are and should be designed to generate the right incentives. Part of the literature on this topic has identified reasons for which the voting systems

\(^5\)While the result that better informed voters make better choices is rather straightforward, the question of how voters should gather the information is much less so, as discussed for instance by Lambert-Mogiliansky (2015).

\(^6\)A perhaps even more striking example is given in Antonakis and Dalgas (2009), showing that a sample of children asked to choose from a picture the ideal “captain of their boat” predicted correctly 71\% of the results of the French parliamentary elections, with a rate of good predictions undistinguishable from the one of adults.

\(^7\)See for instance Pricewaterhouse Coopers (2013). “Identifying and Reducing Corruption in Public procurement in the EU”

\(^8\)See also the survey by Besley (2005).
can interfere ex-ante with the election of politicians. For instance, Myerson (1993) studied the impact of electoral systems on the incentives for corruption and Smart and Sturm (2013) the impact of term limits on the ability of politicians. Underpayment is however the most common problem cited: wrong salary scales or the introduction of penalties for bad politicians may reduce the pool of good politicians to pick from. This is what Gagliarducci and Nannicini (2013) recently showed for Italian municipalities. It is however not a universal explanation for the lack of quality in the pool of potential politicians. Poutvaara and Takalo (2007) and Kotakorpi and Poutvaara (2011) for instance show with Finnish data that higher earnings did not necessarily lead to more qualified politicians, confirming the intuition provided by Mattozzi and Merlo (2008) who argue that an increase in the salary of a politician while in office may actually be a rent, and not the reflect of a higher outside option. Peichl et al. (2013) show that the claim that politicians earn significantly more in the private sector is not confirmed by data on German politicians.

We present the model and solve for the equilibrium strategy of politicians in the next Section. In Section 3, we provide comparative statics on the impact of judicial and accounting courts. Section 4 presents a socially optimal institutional design, together with more local conditions for the different policy tools to increase cost efficiency. We add a citizen-candidate model to our setup in Section 5 and conclude in Section 6.

2 Model

A procurement project has to be delivered. A politician is randomly chosen from a pool of applicants to deliver the project (we explicitly model campaigning and elections in Section 5). There are two possible sources of inefficiency that can lead the project to be delivered at high cost. The first one is an adverse selection problem: politicians are of unobservable ability. The second is a moral hazard problem: a competent politician may be dishonest and deliver at high cost while retaining a share of the difference. We study the relative impact of the quality of the judicial system (monitoring whether a politician is corrupt or not) and of accounting courts (monitoring whether the project is delivered at high cost).

2.1 Politicians

The players in the model are utility maximizing risk neutral politicians. A politician is born with a type $\theta$, drawn from a continuous distribution with density $f(\theta)$, cumulative density $F$ and support $[0,1]$. The type of each politician reflects her competence. First, all politicians simultaneously
choose whether or not to apply for the job. Then, one applicant is picked randomly to deliver the project. Each individual type is a private information, and all the other exogenous parameters are common knowledge.

When into office, a politician discovers a state of the world $\mu \in \{l, h\}$, reflecting her ability to deliver the project. With probability $\theta_i$, the state is $l$, and the politician is able to deliver a project at low cost $c_l = 0$. With probability $1 - \theta_i$, the state is $h$ and the politician has not choice but to deliver the project at high cost $c_h > c_l$.

If the state is $l$ the politician also privately observes her opportunity to steal $s$, drawn from a continuous distribution with density $g(s)$, cumulative density $G$ and support $[0, 1]$. The politician can then either choose to actually deliver the project at low cost $c_l = 0$, or to deliver at high cost while stealing a share $s$ of the cost difference $c_h - c_l$.

The competence of a politician is also reflected in her opportunity cost to work in politics, that is her wage into office net of her outside option, $w(\theta_i)$. We make the assumption that $\frac{\partial w}{\partial \theta} < 0$ and, in most of the analysis $\frac{\partial^2 w}{\partial \theta^2} = 0$, so that $\frac{\partial w}{\partial \theta}$ is the marginal increase in the opportunity cost of being in office when being of a higher type. This assumption is at the basis of the selection problem: a more talented politician is also more talented outside of politics, and therefore bears a greater opportunity cost of joining the pool of applicants.

The strategy of a politician is a double $\{E, s\}$, where $E \in \{j, nj\}$ is the decision of whether ($j$) or not ($nj$) to join the pool of applicants, and $s \in [0, 1]$ is the level above which a politician in state $l$ prefers to steal than to deliver a project at low cost. A strategy $\{E^*, s^*\}$ is an equilibrium for a politician of type $\theta_i$ if $U_{\theta_i}(E^*, s^*) \geq U_{\theta_i}(E, s)$ for all $\{E, s\}$.

### 2.2 The judicial system

After the project is realized, two courts release an informative signal. First, the accounting court releases a signal, correct with probability $p > 0.5$ of whether the project has been delivered at low cost. If the project is reported as high cost, the judicial system releases a signal, correct with probability $q > 0.5$ of whether the politician is corrupt. The politician is condemned and receives a utility punishment of $\gamma > 0$ if and only if both courts find her guilty (high cost and dishonest). The parameters $p$ and $q$ are exogenous (until Section 4), and reflect the respective quality of the two judicial institutions.
2.3 Equilibrium strategy

The expected utility of a politician of type $\theta_i$ choosing a strategy $\{j,s^*\}$, this is to join the pool of applicants, and to steal if and only if $s \geq s^*$, is given by

$$U_{\theta_i}(j,s^*) = w(\theta_i) - (1 - \theta_i)\gamma p(1-q) + \theta_i \left( - \int_0^{s^*} \gamma (1 - q)(1 - p) g(s) ds + \int_{s^*}^1 (sc_h - \gamma qp) g(s) ds \right)$$

(1)

The utility is the sum of the following elements. First, the wage net of opportunity cost $w$. Second, the expected punishment when the state of the world is $h$ (with probability $1 - \theta_i$), so that the politician is incompetent and delivers the project at high cost without being dishonest. The politician is condemned to a punishment $\gamma$ when the project is correctly reported as high cost (with probability $p$) and following a judicial mistake (with probability $1 - q$). Third, when the state is $l$ (with probability $\theta_i$), for the lowest values of $s$, the politician has little to gain from corruption and delivers the project at low cost (with probability $G(s^*)\theta_i$). In that case, she is condemned to a punishment $\gamma$ when both courts make a judicial mistake, with probability $(1 - q)(1 - p)$. Finally, for the highest values of $s$, the politician chooses to accept corruption and steals a share $s$ of the cost difference $c_h$, and is condemned to a punishment $\gamma$ when both courts send a correct signal, with probability $pq$.

A politician that plays a strategy $\{n_j,s\}$ gets utility normalized to $U(n_j,s) = 0$ for all values of $s$ as she does not join the pool of applicants.

We want to identify the politicians for which $U_{\theta_i}(j,s^*) \geq 0$, that constitute the equilibrium pool of applicants. For this, we first need to identify $s^*$, the threshold value above which politicians start stealing.

Lemma 1 In equilibrium, a politician in a state of the world $\mu = l$ prefers to steal whenever $s \geq \hat{s} = \frac{\gamma(p+q-1)}{c_h}$, so that

$$s^* = \begin{cases} \hat{s} & \text{iff } \hat{s} \in [0,1] \\ 1 & \text{iff } \hat{s} \geq 1. \end{cases}$$

Proof. To find $\hat{s}$ one needs to find the smallest value of $s$ such that stealing is preferred to not stealing, that solves

$$sc_h - \gamma pq \geq -\gamma(1-q)(1-p).$$

(2)

We also need to look for corner solutions. As the support of $s$ is $[0,1]$, $s^* = 1$ whenever $\hat{s} \geq 1$. 

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There is no corner solution \( s = 0 \) as \( \hat{s} \geq 0 \) for all \( p, q \geq \frac{1}{2} \). ■

Hence, conditional on entry, the probability that a politician of type \( \theta \) accepts a bribe is given by

\[
S(\theta) = \theta s^*,
\]

so that \( \frac{dS}{d\theta} > 0 \). The fact that more talented politicians steal more is a direct consequence from the fact that they have more opportunity to do so. However, more talented politicians also deliver more often at low cost so that, unless a social planner is interested in fighting corruption as a matter of principle, it should always prefer, all other things held equal, higher quality politicians.

The decision for a politician of type \( \theta \) of whether or not to enter the pool of applicants \( U_\theta \geq 0 \) derives directly from (1), and can be conveniently rewritten as

\[
w(\theta) + \theta \gamma (1 - q)(2p - 1) + \theta \int_{s^*}^{1} c_h(s - s^*) g(s) ds \geq \gamma (1 - q)p
\]

(4)

The least talented politician \( \theta_i = 0 \) decides to enter whenever her wage \( w(\theta) \) is above the expected punishment it faces when being rightly reported at high cost (as \( \theta_i = 0 \) this politician is never able to deliver the project at low cost) and facing a judicial mistake \( \gamma (1 - q)p \). Politicians of higher type have a lower wage net of the opportunity cost of being in office, but gain two additional benefits. The first one \( \theta \gamma (1 - q)(2p - 1) \) is the benefit from being able to produce more often at lower cost and therefore facing lower probability of being convicted following a judicial mistake. This impact is higher when the quality of the auditing court \( p \) is high and the quality of the judicial court \( q \) is low. When \( p \) is high, more able politicians face a lower risk of being reported at high cost if they refuse corruption. When \( q \) is high this relative advantage matters less, as the risk of a judicial mistake is lower. The second is the possibility to steal more often, represented by the utility gain of stealing (above the utility of being honest) whenever \( s \geq s^* \). As from Lemma 1 it is easy to see that both \( q \) and \( p \) have the same effect to decrease the potential benefits from corruption, and therefore increase \( s^* \).

The impact of a higher ability \( \theta \) on the left-hand side of equation (4) is however ambiguous. On the one hand being of a higher type decreases the incentives to enter as more able politicians bear a higher opportunity cost. On the other hand it increases the incentives to enter as one has fewer chances of being convinced while being honest, and more opportunities of being dishonest. While judicial and accounting courts are perfect substitutes in order to deter individual corruption, they have a different impact on judicial mistakes. An increase in \( q \) benefits more the lower type,
that are more often non-guilty of corruption, while an increase in \( p \) may benefit more either types, as it decreases their probability of being convicted when innocent more when the probability of producing at low cost is higher, but also lowers the benefits from corruption.

It can be useful to simplify the problem by assuming that \( w(\theta) \) is linear, with the wage net of opportunity cost of the least able politician \( w(0) = w_o \) and the marginal increase in the opportunity cost of being in office for higher types \( \frac{\partial w}{\partial \theta} = -\bar{w} \). This allows us to rewrite (4) as

\[
\theta \left( \gamma(1-q)(2p-1) + \int_{s^*}^{1} c_h(s-s^*)g(s)ds - \bar{w} \right) \geq \gamma(1-q)p - w_0. 
\]

We can thus define the marginal benefit and the marginal cost of being a politician of a higher type. The marginal benefit is given by

\[
MB_\theta = \gamma(1-q)(2p-1) + \int_{s^*}^{1} c_h(s-s^*)g(s)ds.
\]  

The impact of the quality of the judicial system on the marginal benefit of being a high type is always negative, \( \frac{dMB_\theta}{dq} = -\gamma(2p-1) - (1 - G(s^*))g(s^*) < 0 \). Indeed, the derivative of the first term of equation (6) with respect to \( q \) is negative, and by Lemma 1 we know that \( \frac{ds^*}{dq} = \frac{\gamma}{c_h} > 0 \). The impact of the quality of the auditing court \( \frac{dMB_\theta}{dp} = \gamma(2(1-q) - G(s^*))g(s^*) \) is however ambiguous, as the derivative of the first term of equation (6) with respect to \( p \) is positive while the derivative with respect to the second term is negative.

The marginal cost of being a politician of higher type is given by the increase in the opportunity cost of being in office

\[
MC_\theta = \bar{w},
\]

and is a constant as we have assumed \( w(\theta) \) to be linear.

Finally, using (4) and the linear form of \( w(\theta) \), the payoff of a politician in office with the lowest possible ability \( \theta_i = 0 \) can be written as

\[
U_0(j) = w_0 - \gamma(1-q)p,
\]

with \( \frac{dU_0(j)}{dq} > 0 \) and \( \frac{dU_0(j)}{dp} < 0 \). The politician with the lowest possible ability is never corrupt, as she never has the opportunity to produce at a low cost. She thus always benefits from higher quality judges. As she always produces at a high cost however, an accounting court of higher
quality always decreases her payoff when in office.

Using (5) we can then define the indifferent type \( \hat{\theta} \) as the solution to the following equality:

\[
\hat{\theta} = \frac{-U_0(j)}{MB_\theta - MC_\theta}.
\] (9)

We can now formally present the equilibrium strategy of a politician

**Proposition 1** The equilibrium strategy of a politician is a pair \( \{E,s^*\} \), with \( s^* \) defined in Lemma 1 and

\[
E = \begin{cases} 
  j \text{ iff } \theta_i \geq \theta^- = \max\{\hat{\theta}, 0\} & \text{iff } MB_\theta > MC_\theta \\
  j \text{ iff } \theta_i \leq \theta^+ = \min\{\hat{\theta}, 1\} & \text{iff } MB_\theta < MC_\theta.
\end{cases}
\]

**Proof.** The sign of \( MB_\theta - MC_\theta \) determines the direction of the inequality. If \( MB_\theta > MC_\theta \), equation (5) can be rewritten as

\[
\theta \geq \frac{-U_0(j)}{MB_\theta - MC_\theta} = \hat{\theta}.
\] (10)

If \( MB_\theta < MC_\theta \), equation (5) can be rewritten as

\[
\theta \leq \frac{-U_0(j)}{MB_\theta - MC_\theta} = \hat{\theta}.
\] (11)

We also need to define \( \theta^- = \max\{\hat{\theta}, 0\} \) and \( \theta^+ = \min\{\hat{\theta}, 1\} \) in order to take into account corner solutions, as \( \theta \in [0, 1] \).

Depending on whether the marginal benefit of being of a higher type is higher than the marginal cost, the pool of applicants is constituted of either only the most able or the least able politicians, but never disjoint subsets of \([0, 1]\).

The game can also lead to corner solutions where either all or no politicians enter. When \( MB_\theta \to MC_\theta \), the denominator of (9) goes to zero. This implies that for \( MB_\theta > MC_\theta \) the condition goes to \( \theta \geq \infty \) iff \( U_0(j) < 0 \) (no politician enter) and \( \theta \geq -\infty \) iff \( U_0(j) > 0 \) (all politicians enter). Similarly, for \( MB_\theta < MC_\theta \) the condition goes to \( \theta \leq \infty \) iff \( U_0(j) < 0 \) (no politician enter) and \( \theta \leq -\infty \) iff \( U_0(j) > 0 \) (all politicians enter). This implies that there is a continuity in the equilibrium quality of the pool of applicants, as depending on the value of \( U_0(j) \) at this point, either all or no politician choose to enter around the values at which \( MB_\theta = MC_\theta \).

In the next Section, we study how the equilibrium is affected by the quality of the different courts.
3 Analysis

We first look at the impact of the respective quality of the judicial and accounting courts on the quality of the pool of politicians.

Proposition 2 The average ability of a politician entering the pool of applicants decreases when the quality of the signal sent by judges $q$ increases if and only if

$$
\begin{align*}
\hat{\theta} &\leq -\frac{dU_0(j)/dq}{dMB_\theta/dq} \quad \text{iff } MB_\theta > MC_\theta \\
\hat{\theta} &\geq -\frac{dU_0(j)/dq}{dMB_\theta/dq} \quad \text{iff } MB_\theta < MC_\theta,
\end{align*}
$$

where $-\frac{dU_0(j)/dq}{dMB_\theta/dq} = \frac{p}{(2p-1)+g(s^*)/(1-G(s^*)]}$.

The formal proof is in Appendix. When the quality of judges $q$ increases, two effects affect the politicians. The first one derives from the fact that $\frac{dMB_\theta}{dq} < 0$ and is a selection effect: a better quality of the signal sent by the judicial court decreases the advantage of being more able, as the relative advantage comes from avoiding more judicial mistakes while innocent and being able to steal more often. This effect decreases the utility of all politicians, but affects more the most able ones. The second effect derives from $\frac{dU_0}{dq} > 0$ and is an entry effect: higher quality of judges make it overall safer to be a politician (as stealing is always a choice). When $MB_\theta > MC_\theta$, if the first effect dominates for the “threshold” politician indifferent between entering or not, this politician is worse off when $q$ increases. As for $MB_\theta > MC_\theta$ only the most able politicians enter, this implies that fewer politicians enter the pool of applicants and that those politicians are of higher quality. If the second effect dominates, the “threshold” politician is made better off by the higher quality of judges, hence more politicians (of lower ability) enter. All other things held equal, the first effect is more likely to dominate if the threshold politician is of a high type (as she has more to lose). Similarly, for $MB_\theta < MC_\theta$, as only the least able politicians enter, if the first effect dominates fewer politicians enter and the average quality decreases, while the opposite is true if the second effect dominates.

It is possible to rewrite the condition in Proposition 2 to show that the threshold politician is made better off by an increase in $q$ if and only if

$$
(1 - \hat{\theta})p + \hat{\theta}(1 - p) \geq \hat{\theta}(1 - G(s^*))g(s^*).
$$

The left-hand side is decreasing in $\hat{\theta}$ and represents the benefits of the possibility of being found more often innocent when $q$ increases. As higher ability politicians are less often in state $h$ where
the probability of being convicted while non-corrupt is higher, they benefit less from this effect. The right-hand side is the loss from the benefits of corruption. As the higher types benefit more often from bribes in equilibrium, the negative impact on them is higher. It can be noted that, without corruption ($s^* \rightarrow 1$), an increase in $q$ always benefits everyone. It is only because it decreases the benefits from corruption that some more able politicians may be worse off when the quality of the signal sent by judges increases.

We illustrate the two effects in Figure 1 (in Appendix). The gray area represents the range of the ability of the politicians entering the pool at equilibrium. The Figure on the left-hand side is a situation favorable to the most able politicians with a relatively small dispersion of the opportunity cost of being in office $\bar{w}$, high potential gains from corruption $c_h$ and punishment when convicted $\gamma$, and a relatively competent accounting court $p$. For the lowest values of $q$, corruption is relatively widespread when the state of the world is $l$ (low $s^*$), and the “threshold” politician $\hat{\theta}$ is of relatively high ability. Hence, when $q$ increases the threshold politician is made slightly worse off, so that the marginally less able politicians leave the pool of applicants. For intermediate values of $q$, it starts becoming more and more interesting for the least able politicians to enter, as they are less likely to be the subject of a judicial mistake, up to the point where all politicians join the pool of applicants.

The Figure on the right-hand side is a situation more beneficial to less able politicians, with a higher dispersion of opportunity costs of being in office, slightly higher wages in charge $w_0$, less to gain from corruption, lower punishment when convicted, and a relatively less competent accounting court. For the lowest values of $q$, no politician wants to enter, as the risk of being punished by mistake is too high for everyone. When $q$ increases some low ability politicians start to enter, and the quality of the pool of politicians increases when the risk of being convicted by mistake decreases, while corruption decreases.

**Proposition 3** The average ability of a politician entering the pool of applicants decreases when the quality of the signal sent by the accounting court $p$ increases if and only if

$$\hat{\theta} \leq -\frac{dU(j)/dp}{dMB_\theta/dp} \quad \text{iff } MB_\theta > MC_\theta,$$

$$\hat{\theta} \geq -\frac{dU(j)/dp}{dMB_\theta/dp} \quad \text{iff } MB_\theta < MC_\theta,$$

where $-\frac{dU(j)/dp}{dMB_\theta/dp} = \frac{1-q}{(1-q)-g(s^*)(1-G(s^*))}$.  

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9For all the Figures, we use a uniform distribution for $s$, so that if $\hat{s} \leq 1$, $\hat{\theta} = -\frac{2c_3(w_0+\gamma p(q-1))}{c_3^2-2c_3(\gamma p(2q-1)+\gamma p)+p(2q-1)^2}$ and if $\hat{s} > 1$, $\hat{\theta} = \frac{w_0+\gamma p(q-1)}{2\gamma p-1/(q-1)+\gamma}$. 

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Proof. Similar to Proposition 2. ■

When the quality of the signal sent by the accounting court $p$ increases, two effects affect the politicians. The first one is a selection effect, that may either be positive for all politicians, but relatively more for the most able, or negative for all politicians, but relatively less for the least able. As better accounting courts decrease corruption, and as more able politicians are more often accepting bribes, their utility loss from lower corruption when $p$ increases is higher. However, a higher $p$ makes it more likely for an honest low ability politician to be reported as high cost, and less likely for an honest high ability politician. The second is an entry effect, negative for all politicians, as the probability of being caught when delivering at high cost is higher.

When $MB_\theta > MC_\theta$, if the sum of the two effects is negative for the “threshold” politician indifferent between entering or not, this politician is worse off when $q$ increases. As for $MB_\theta > MC_\theta$ only the most able politicians enter, this implies that fewer politicians enter the pool of applicants and that those politicians are of higher quality. This can be the case even if the first effect is positive, but not enough to counterbalance the second. Similarly, for $MB_\theta < MC_\theta$, as only the least able politicians enter, if the payoff of the threshold politician decreases, the average quality of the pool decreases.

It is possible to rewrite the condition in Proposition 3 to show that the threshold politician is made better off by an increase in $p$ if and only if

$$(1 - q)(2\hat{\theta} - 1) \geq \hat{\theta}g(s^*)(1 - G(s^*)).$$

(13)

The left-hand side is positive for the most able politicians $\theta \geq \frac{1}{2}$ and represents the benefits of the possibility of being found more often innocent when the state of the world is $l$ minus the cost of being found more often guilty when the state of the world is $h$. As higher ability politicians are more often in state $l$, they benefit more from this effect. The right-hand side is the loss from the benefits of corruption, identical to the loss created by an increase in $q$. As the more able politicians benefit more often from bribes in equilibrium, the negative impact on them is higher. Without corruption ($s^* \rightarrow 1$), an increase in $p$ always benefits the most able half of the politicians and hurts the other half. Because an increase in $p$ also decreases the benefits from corruption, the actual level of $\theta$ at which politicians start benefiting from an increase in $p$ is however actually higher. All politicians can even be made worse off if $\frac{dMB_\theta}{dp} \leq 0$.

We illustrate the two effects on Figure 2 (in Appendix). The gray area represents the range of the ability of the politicians entering the pool at equilibrium. The Figure on the left-hand side
represents a situation where only the most able politicians choose to enter. For the lowest values
of \( p \), the risk of being reported at high cost when in state \( h \) is not very high, so that a large
share of the least able politicians chooses to enter. Moreover, corruption is relatively widespread.
When \( p \) increases, corruption continues to decrease, and the average ability of politicians starts
to increase as the risk of being wrongfully convicted while reported at high cost in a state of the
world \( h \) becomes higher. Hence, a higher \( p \) both increases the average quality of the politicians
and decreases corruption.

The Figure on the right-hand side is a situation more favorable to the least able politicians,
where both the wages of the least able politicians \( w_0 \) and the marginal increase of the opportunity
cost of being in office \( \bar{w} \) are higher. Both the potential benefits \( c_h \) from corruption and costs
\( \gamma \) of being convicted are lower. For the lowest values of \( p \), corruption is high and the risk of
being reported at high cost while accepting bribes remains sufficiently low for some relatively
able politicians to enter. When \( p \) increases, the net benefit from accepting bribes decreases, so
that the most able politicians stop entering the pool of applicants. Hence, increasing \( p \) decreases
corruption, but it also decrease the average quality of the politicians.

We can now turn to the analysis of the respective impact of the quality of the judicial and
accounting court on the probability that a project is delivered at a low cost. It is useful to define
the expected ability of a politician in the pool of applicants as \( \bar{\theta} \), with

\[
\bar{\theta} = \begin{cases} 
\frac{\int_{\theta}^{\bar{\theta}} \theta f(\theta)d\theta}{1-F(\bar{\theta})} & \text{iff } MB_\theta > MC_\theta \\
\frac{\int_{\theta}^{\bar{\theta}} \theta f(\theta)d\theta}{F(\bar{\theta})} & \text{iff } MB_\theta < MC_\theta .
\end{cases}
\]

The equilibrium probability that a project is delivered at low cost is

\[ \lambda = G(s^*)\bar{\theta}. \]  \hspace{1cm} (14)

The probability that a project is delivered at low cost is equal to the probability that a politician
does not steal when in state \( l \), \( G(s^*) \), multiplied by the expected ability of the politician, equal to
her probability of being in state \( l \). The expected ability of a politician is derived directly from the
pool of applicants found in Proposition 1

**Proposition 4** Courts of higher quality \( i \in \{q, p\} \) marginally decrease the cost efficiency of pro-
curement projects if and only if they have a negative effect on the average ability of the pool of
applicants, and if this effect outweighs the effect on corruption deterrence,

$$-\frac{\partial \widehat{\theta}}{\partial i} G(s^*) \geq \frac{\partial s^*}{\partial i} g(s^*) \widehat{\theta}.$$  \hfill (15)

**Proof.** The proof directly follows from $\frac{d\lambda}{dq}$ and $\frac{d\lambda}{dp}$, with $\lambda$ defined in (14). ■

The left-hand side of (15) is the loss of cost efficiency for a given level of corruption when the pool of candidates is modified by the quality of the court. It is given by $\frac{\partial \widehat{\theta}}{\partial i}$, the impact of the quality of the court $i \in \{q, p\}$ on the average ability of a politician, multiplied by $G(s^*)$, the probability that a given politician in the good state $l$ refuses a bribe (with a minus sign). The right-hand side is the gain of cost efficiency for a given pool of candidates when the rate of corruption $s^*$ is modified by the quality of the court. There may be a tradeoff between the quality of the pool of applicants and the level of corruption. In particular, if a higher quality of the judicial or accounting court decreases the quality of the pool of politicians, even if the probability that each given politician is corrupt decreases, the cost efficiency of the projects may decrease. The probability that a project is delivered at low cost $\lambda$ is represented in both Figure 1 and 2, with $F(\theta) = \theta$. It is easy to see that the average cost efficiency of the projects delivered always increases with $q$ or $p$ when this variable increases the average quality of the pool of politicians, but has an ambiguous effect otherwise.

It is also possible to study the rate of corruption $\sigma$, which is defined by the share of projects for which a politician has accepted a bribe. The equilibrium probability that a project has been subject to corruption is given by

$$\sigma = (1 - G(s^*)) \widehat{\theta}. \hfill (16)$$

The probability that a project has been subject to corruption is equal to the probability that a politician steals when in state $l$, $1 - G(s^*)$, multiplied by the expected ability of the politician, equal to her probability of being in state $l$. The expected ability of a politician is derived directly from the pool of applicants found in Proposition 1.

**Proposition 5** Courts of higher quality $i \in \{q, p\}$ marginally increase the share of procurement projects subject to corruption if and only if they have a positive effect on the average ability of the pool of applicants, and if this effect outweighs the effect on corruption deterrence,

$$\frac{\partial \widehat{\theta}}{\partial i} (1 - G(s^*)) \geq \frac{\partial s^*}{\partial i} g(s^*) \widehat{\theta}. \hfill (17)$$

**Proof.** The proof directly follows from $\frac{d\sigma}{dq}$ and $\frac{d\sigma}{dp}$, with $\sigma$ defined in (16). ■
The right-hand side of (17) is the marginal impact of the quality of a court on the rate of corruption of each politician $s^*$, for a given average ability of applicants $\bar{\theta}$. The left-hand side is the marginal impact on the quality of the pool of politicians for a given $s^*$. If courts of higher quality improve the average ability of politicians, this may therefore have the indirect effect of increasing corruption. In that case, courts of lower quality may decrease corruption simply because politicians are less able and therefore less often able to steal. The probability that a project is subject to corruption $\sigma$ is represented in both Figure 1 and 2, with $F(\theta) = \theta$. It is easy to see that the cases in which corruption decreases the most drastically are the cases in which the quality of politicians also decreases, increasing the expected cost of a project. As only projects carried in state $l$ can be subject to corruption, it always holds that the sum of $\lambda$ and $\sigma$ is equal to the average quality of politicians joining the pool of applicants $\bar{\theta}$.

Finally, the share of judicial mistakes can be easily characterized as the expected probability that a politician gets punished without having accepted a bribe. The equilibrium probability that a politician is convicted without having been subject to corruption is given by

$$\phi = (1 - q)((1 - p)\lambda + p(1 - \lambda - \sigma))$$  \hfill (18)

The first part of the judicial mistakes comes from the politicians who deliver the project at low cost ($\lambda$), are wrongfully reported at high cost ($1 - p$), and wrongfully convicted ($1 - q$). The second part comes from the politicians who deliver at high cost without being corrupt, ($1 - \lambda - \sigma$), are correctly reported at high cost ($p$) and wrongfully convicted ($1 - q$). When the quality of the judicial court increases, it has a direct effect of both decreasing the probability of a judicial mistake in a given case and decreasing the probability that a given politician accept bribes. However, if it also decreases the quality of the pool of applicants it may actually increase the share of judicial mistakes by increasing the number of cases in which individuals are reported at high cost while in state $h$ but honest. When the quality of the accounting court increases, it has the direct effects of decreasing corruption, increasing the probability that a politician in state $h$ is reported at high cost, and decreasing the probability that a politician in state $l$ is reported at high cost. Hence, the sum of the direct effects may actually be to increase the probability of a judicial mistake. This effect can be either exacerbated or mitigated by the indirect effect of $p$ on the quality of the pool of applicants.
4 Policy

In the previous sections, we discussed the equilibrium and comparative statics of the game, while taking as exogenous the parameters on which a social planner may have an influence: $q, p, w_0$ and $\gamma$. In this section, we consider an initial stage of the game, where a social planner chooses the parameters in order to maximize an objective function $V$ given the expected strategy of the politicians,

$$\max_{q, p, w_0, \gamma} V(\lambda, \sigma, \phi).$$  \hfill (19)

We assume that a social planner may have an interest in three different objectives: maximizing the share of low cost projects delivered $\frac{\partial V}{\partial \lambda} \geq 0$, minimizing the share of projects subject of corruption $\frac{\partial V}{\partial \sigma} \leq 0$, and minimizing the number of judicial mistakes in which an innocent politician is convicted $\frac{\partial V}{\partial \phi} \leq 0$.

The most obvious question is to determine the optimal policy for a social planner allowed to choose the values of all parameters at no cost. Such an optimal policy needs to fulfill three conditions. First, a condition on the absence of corruption, so that $s^* \geq 1$. This implies that the level of punishment should be sufficiently high,

$$\gamma \geq \frac{c_h}{p + q - 1}. \hfill (20)$$

This condition is also sufficient to ensure $\sigma = 0$. Second, a condition that ensures that only the most able politicians enter, this is $MB_\theta \geq MC_\theta$. Assuming condition (20) is fulfilled, this means that the quality of the accounting court should be sufficiently high, and the quality of the judicial courts sufficiently low,

$$(1 - q)(2p - 1) \geq \frac{\bar{w}}{\gamma}. \hfill (21)$$

Moreover, only the most able politician should be entering the pool of applicants. If conditions (20) and (21) are satisfied, $w_0$ should be the lowest value that satisfies $U(1) \geq 0$,

$$w_0 = \gamma (1 - q)(1 - p) + \bar{w}. \hfill (22)$$

The last two conditions (21) and (22) ensure that only the most able politicians $\theta = 1$ enter. Hence, as there is no corruption by the first condition, all projects are delivered at low cost $\lambda = 0$. Finally,
to ensure the absence of judicial mistakes, it should be the case that at least either $p$ or $q$ is equal to 1. As it is impossible to fulfill condition (21) with $q = 1, \bar{w} > 0$ and a finite value of $\gamma$, the four conditions to be met simultaneously are $p = 1, \gamma \geq \frac{c_h}{q}, q \leq 1 - \frac{\bar{w}}{\gamma}$ and $w_0 = \bar{w}$.

An ideal policy that simultaneously fulfills these three conditions always exists and is not unique. The following Proposition offers an example.

**Proposition 6** There exists a socially optimal policy where only the most able politicians $\theta = 1$ enter, there is no corruption ($\sigma = 0, \lambda = 1$), and no one is convicted while innocent ($\phi = 0$). An example of optimal policy is $p = 1, q = \frac{1}{2}, \gamma > \max\{2c_h, 2\bar{w}\}$ and $w_0 = \bar{w}$.

**Proof.** There is no corruption if and only if $s^* \geq 1$, which using Lemma 1 and $p = 1, q = \frac{1}{2}$ simplifies to $\gamma \geq 2c_h$. Only the most able politicians choose to enter when $MB_{\theta} > MC_{\theta}$, which, when $s^* = 1, p = 1$ and $q = \frac{1}{2}$ simplifies to $\gamma > 2\bar{w}$. Finally, when $s^* = 1, p = 1$ and $q = \frac{1}{2}$ the most able politician $\theta = 1$ prefers to join the pool of politicians if and only if $w_0 \geq \bar{w}$.

In the policy presented in Proposition 6, the accounting court is able to perfectly screen the high cost projects, and the politicians delivering at high cost receive a sufficiently high punishment to deter corruption. The judges are replaced by a random punishment of the high cost projects (as $q = \frac{1}{2}$) that punishes indistinguishably the least able and the corrupt, to deter entry from the least able. Finally, the wage in office is sufficiently high to attract the most able politicians even without the benefits of corruption.

It would be possible to attain the same outcome by increasing the quality of the judicial system $q$, the level of punishment $\gamma$ and the wage of the politicians $w_0$. As a general principle, all optimal solutions imply a sufficiently high quality of the accounting court, a sufficiently low quality of the judicial court, a sufficiently high level of punishment and a level of wages high enough to attract the most able politicians but not too high to avoid attracting less able ones.

This Proposition however reflects a rather unrealistic world in which it is actually possible to fully determine and commit to the value of these parameters. In an imperfect world, it may be relevant to wonder about the marginal benefit for a social planner to modify the value of one parameter. In order to do so, one would need to be more specific about the weight given to the respective arguments of $V$, which goes beyond the objectives of the present paper. While it is possible to do the exercise for each of the criterion studied in the previous subsections, the most obvious candidate is the share of the project that a social planner can expect to deliver at low cost $\lambda$.

The first two parameters, $p$ and $q$ have been largely studied in the previous subsections. It is
easy to show that \( \frac{\partial \bar{\theta}}{\partial q} \geq 0 \) when

\[
g(s^*) \frac{\partial \bar{\theta}}{\partial q} \geq - \frac{\partial \bar{\theta}}{\partial q} G(s^*). \tag{23}
\]

This inequality is always satisfied when \( \frac{\partial \bar{\theta}}{\partial q} \geq 0 \), as increasing the quality of judges decreases both corruption and incompetence. A social planner willing to decrease the share of projects delivered at low cost could do so by marginally increasing the quality of the judicial system only if the benefits from deterring corruption are not offset by attracting less able politicians. As shown in Proposition 2 this is often the case when few people are willing to enter politics, as increasing the quality of \( q \) either allow becoming even more selective with the best politicians, or less selective when the less able politicians enter.

Similarly, \( \frac{\partial \lambda}{\partial p} \geq 0 \) when \( g(s^*) \frac{\partial \bar{\theta}}{\partial p} \geq - \frac{\partial \bar{\theta}}{\partial p} G(s^*) \). As shown in Proposition 3, increasing the quality of the accounting courts is beneficial when the most able politicians enter and corruption is high, and detrimental when corruption is lower and the least able politicians enter.

Maybe the most direct instrument is the wage level of the politicians, given by \( w_0 \). As \( \tilde{w} \) is constant, increasing \( w_0 \) increases the wage of all politicians by the same amount. Using the results from the previous sections, it is possible to show that

\[
\frac{\partial \bar{\theta}}{\partial w_0} = - \frac{1}{MB_{\theta} - MC_{\theta}}, \tag{24}
\]

and \( \frac{\partial s^*}{\partial w_0} = 0 \). Hence \( \frac{\partial \lambda}{\partial w_0} \geq 0 \) if and only if \( MB_{\theta} < MC_{\theta} \). It is only if the least able politicians choose to join the pool of applicants that increasing the wage of politicians has a positive effect. Else, increasing the wage of politicians actually decreases the quality of the projects delivered by being less selective with the ability of the politicians in the pool of applicants. This result may help explaining the conflicting evidence on the impact of the wages on the quality of politicians reported in the introduction.

Finally, the impact of the level of punishment on the expected cost efficiency of the projects is more subtle. The impact of \( \gamma \) on \( MB_{\theta} - MC_{\theta} \) is ambiguous, as

\[
\frac{dMB_{\theta}}{d\gamma} = (1 - q)(2p - 1) - g(s^*)(1 - G(s^*)) (p + q - 1). \tag{25}
\]

The first part is positive as the more able politicians suffer relatively less from the higher cost of being convicted. The second part is negative, as the loss from taking fewer bribes affects more the most able politicians. The impact on \( U_0 \) is clearly negative, \( \frac{dU_0}{d\gamma} = -(1 - q)p \), and so is the
impact on the payoff of any type of politician. Hence, the direct effect of an increase in $\gamma$ is clearly beneficial when only the most able politicians enter $MB_\theta > MC_\theta$, as it allows being more selective among the best politicians and deters corruption, as long as at least some politicians want to enter the pool of applicants. When the least able enter, increasing the level of punishment $\gamma$ is only beneficial when the impact on corruption outweighs the selection effect.

5 A citizen-candidate model

In this Section, we extend the setup to explicitly model elections, following the citizen-candidate model used in Osborne and Slivinski (1996), Besley and Coate (1997) and Caselli and Morelli (2004).

In the first stage, a continuum of mass $1+\pi$ of citizens simultaneously decides whether or not to become candidate. In our notation, this decision is captured by the strategy $E \in \{j,nj\}$, and a citizen playing $j$ is a “candidate.” We also add to our initial setup that campaigning has a fixed cost $\psi > 0$. We denote by $m$ the equilibrium mass of candidates, $\chi$ the distribution of the candidate types, with $f_j(\theta, \chi)$ the density of the ability of the candidates,\(^{10}\) so that $\int_0^1 f_j(\theta, \chi) d\theta = m$.

In the second stage, voters elect a mass $\pi$ of the candidates, using a common imperfect observable signal of their ability. In the traditional citizen-candidate models politicians are of discrete types. As we work with a continuum of types and want to stick as much as possible to the traditional model, we assume voters observe a signal $\theta_a \in \{a,\bar{a}\}$, denoting respectively high ($a$) or low ($\bar{a}$) ability. We further assume that the probability of being observed as a high type $\omega_a(\theta)$ is strictly increasing in the type of the politician, $\frac{\partial \omega_a}{\partial \theta} > 0$, so that the signal is at least somehow informative of the ability of the politician. We also assume that the utility of citizens is strictly increasing in the share of projects delivered at low cost $\lambda$, so that in equilibrium citizens voting sincerely randomize with equal probability among all the candidates observed as high type $a$. Hence, in equilibrium only candidates observed as high type have votes casted on their names. If too many (or not enough) candidates have votes, the ties are broken randomly.

The probability of being elected conditional on playing $j$ is thus given by $P_a$ (see Appendix for details), with $\frac{\partial P_a}{\partial \theta} > 0$, $\frac{\partial P_a}{\partial \pi} \leq 0$ and $\int_0^1 P_a(\theta, \chi) f_j(\theta, \chi) d\theta = \pi$.

In the third stage, politicians play the game described in the previous sections, deciding whether or not to accept bribes using a cutoff value $s^*$ and receiving payoffs conditional on the realization of the state of the world $\mu \in \{l,h\}$ and on the realization of the signals of both courts.

\(^{10}\)Formally, $\chi$ is the distribution of the strategies $E \in \{j,nj\}$ of the citizens, so that $f_j(\theta,j) = f(\theta)$ and $f_j(\theta,nj) = 0$.\[\int_0^1 f_j(\theta, \chi) d\theta = m.\]
It is straightforward that, the equilibrium value of \( s^* \) is unaffected by the change of setup and remains as defined in Lemma 1, as \( s^* \) is payoff-relevant only if the politician is elected and in state \( l \). The decision of whether to campaign or not can be rewritten by modifying (5),

\[
P_a(\theta_i, \chi) \left( \theta \gamma (1-q)(2p-1) + \theta \int_{s^*}^1 c_h(s-s^*)g(s)ds - \gamma(1-q)p + w_0 - \bar{w} \right) \geq \psi. \tag{26}
\]

Using the notation from the previous sections, this rewrites as

\[
P_a(\theta_i, \chi) \left( \theta (MB_\theta - MC_\theta) + U_0 \right) \geq \psi. \tag{27}
\]

Equation (27) can conveniently be rewritten as \( P_a(\theta_i, \chi)U_0(j, s^*) \geq \psi \). Both \( P_a(\theta_i, \chi) \) and \( \psi \) impact the equilibrium pool of candidates.

A good quality of the signal observed by the voters can be enough to convince more able politicians to enter even if \( MB_\theta < MC_\theta \), as long as \( U(\theta, E) > 0 \). This is because the probability that the cost of campaigning is wasted is lower for the most able candidates. In that sense, better-informed voters solve a large part of the selection problem.

The equilibrium share of projects delivered at low cost is given by

\[
\lambda = \int_0^1 \theta P_a(\theta, \chi)f_j(\theta, \chi)G(s^*)d\theta. \tag{28}
\]

Hence, a signal \( \omega' \) always improves the quality of the pool of candidates, of the elected politicians and the share of projects delivered at low cost \( \lambda \) if it is of “better quality” than a signal \( \omega \). By better quality, we mean that the signal yields higher probability of being elected for the most able candidates. Formally, a signal \( \omega' \) is of better quality if for the resulting probabilities of being elected \( P', P'_a(\theta_i, \chi) \) are higher (resp. lower) for all \( \theta_i \) higher (resp. lower) than the average of the pool of candidates \( \int_0^1 f_j(\theta, \chi)\theta d\theta \).

The impact of the cost of campaigning \( \psi \) is ambiguous. Assuming an increase in \( \psi \) means that campaigning is more expensive for everyone. Hence, if the pool of candidates is composed of the most able politicians, a higher cost of campaigning always increases the quality of the pool. However, if the candidates are the least able politicians and if the threshold politician is of a type above the average, an increase in the cost of campaigning actually decreases the quality of the pool of politicians (and of the elected politicians).
6 Conclusion

This model is a first attempt at looking in the scope and limits of judicial and accounting courts in efforts to disentangle the respective roles of corruption and incompetence in public procurement. The model is clearly a simplification of the complex interactions between corruption, incompetence and public procurement outcomes. At least three important elements would deserve further investigation.

The first one is the voters. As shown in Section 5, increasing the correlation between the choice of the voters and the ability of politicians would be the simplest way to solve the selection problem. As discussed in the introduction however, we are far from the point at which elections alone screen the most able politicians. The ambiguous impact of both courts studied in the paper makes the case even stronger for a higher quality of the democratic screening.

The second one is the political influence in the staffing of judicial and accounting courts. Accounting courts in many democracies are usually not involved in choosing the policy options, but focus on measuring costs. There are, however, many instances, in which auditors have a clear political affiliation, which gives some margin to politicians to set the standards for costs assessments to be conducted. Similar observations can be made for key tribunals (think of the formal or informal political affiliation of the members of the supreme court in the US or in Spain for instance) and for the definition of the limits to conflicts of interests to be implemented by judges. This opens the door to political deal making and other forms of distortions. It would therefore make sense to look into the impact of political influence on the role and effectiveness of judicial and accounting courts. Besley and Coate (2003) develop this idea by contrasting direct elections of regulators with political appointment but more work is probably needed to refine the assessment of the scope and limits of these courts in reducing moral hazard and adverse selection in public procurement processes.

The third one is that we define the quality of the courts as being the probability that the observation of the court is correct. While this assumption is useful in order to get tractable results, it would be interesting to separate type I and type II errors. More precisely, for a given quality of the institutions, whether courts let more guilty politicians escape or condemn more innocent ones clearly has implications on the selection of politicians.

The main message of the paper remains however robust. As in many policy issues, good intentions building on intuition have their limits since they can lead to perverse effects in the population of the pool of politicians voters can pick from. In addition, with an increase in the
role of accounting courts, there is the possibility that politicians may avoid to commit for anything which could negatively impact their performance, reducing the public sector performance in yet another way. Unless voters put pressure on the potential candidates to take a transparent position of difficult choices to make, it is very likely that the political agenda will be manipulated by the politicians, whether corrupt or incompetent, and that the cost and overall effectiveness of public procurement processes will be negatively affected.
Bibliography


Appendix A: Proofs

Proof of Proposition 2:

Proof. If $\hat{\theta} \in (0,1)$ has an interior solution, the average ability of a politician in the pool of applicants decreases with the quality of the signal sent by judges if $\frac{d\hat{\theta}}{dq} \leq 0$, as it makes the pool of politicians less selective if $MB_\theta > MC_\theta$ and more selective otherwise. It is easy to show that $\frac{d\hat{\theta}}{dq} \leq 0$ if and only if

$$-\frac{dU_0(j)}{dq}(MB_\theta - MC_\theta) + \frac{dMB_\theta}{dq}(U_0(j)) \leq 0. \quad (29)$$

If $\hat{\theta} \in (0,1)$, it must be that $(-U_0(j))$ and $(MB_\theta - MC_\theta)$ are of identical sign. Hence, (29) rewrites

$$\frac{dMB_\theta/dq}{MB_\theta - MC_\theta} \geq \frac{dU_0(j)/dq}{U_0(j)}, \quad (30)$$

where $\hat{\theta} = \frac{-U_0(j)}{MB_\theta - MC_\theta}$. If $\hat{\theta} \notin (0,1)$, the statement is trivial as either all or no politicians enter the pool of applicants depending on the value of $U_0(j). \blacksquare$

Probability of being elected in the citizen-candidate model:

$$P_e(\theta, \chi) = \begin{cases} \frac{\pi}{m} \int_0^1 \frac{\omega_0(\theta_i)f_j(\theta, \chi)d\theta}{\int_0^1 \omega_0(\theta_i)f_j(\theta, \chi)d\theta} & \text{if } m \int_0^1 \omega_0(\theta)f_j(\theta, \chi)d\theta \geq \pi \\ \omega_0(\theta_i) + \frac{(1-\omega_0(\theta_i))(m-\int_0^1 \omega_0(\theta_i)f_j(\theta, \chi)d\theta)}{m(1-\int_0^1 \omega_0(\theta_i)f_j(\theta, \chi)d\theta)} & \text{if } m \int_0^1 \omega_0(\theta)f_j(\theta, \chi)d\theta < \pi. \end{cases}$$

In the first case, too many candidates have a signal of high quality $a$, and hence the ties are broken by randomly selecting $\pi$ of them. In the second case, not enough candidates have a signal of high quality. Hence all candidates with a signal $a$ are elected and the remaining are randomly selected among the candidates with a low quality signal $\bar{a}$.  

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Appendix B: Figures

Figure 1: Comparative statics: the quality of the judicial system $q, \epsilon_h = \gamma$ and $G(s) = s$.

Figure 2: Comparative statics: the quality of the accounting courts $p$, for $q = 0.7, \gamma = \epsilon_h$ and $G(s) = s$. 