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Auctioning off a favour: corruption and lobbying in a combo model

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Abstract

It is the prevailing approach in the public choice literature to model lobbying and corruption in the same manner. On the contrary, we attempt to capture both in the same framework (auction theory), but using different modelling approaches. We present a unified framework in which some interesting conclusions ensue, not the least the possibility of a benign view on corruption as in Besley (2006).

JEL codes: D72, D73, H83.

1 Introduction

Most of the political economy of corruption has taken a quite understandable view, assuming that corruption is a bad thing almost by the force of its name. Modelling approaches have followed suit, depicting corruption as an instance of rent-seeking, where the expenditure on bribes constitutes a deadweight loss to society (Lambsdorff 2002).

We submit that the two are not necessarily the same. Paying for placards of a candidate for public office to be hung on every available building does differ from buying a Porsche for the same candidate *after her election*. While the former is clearly a deadweight loss as the efforts to promote candidates of various persuasions cancel out (besides providing a public nuisance to boot), the latter is more of a transfer. The consequence of that, of course, would be that bribery *in itself* is not a sign of inefficiency (Besley 2006, ???) – additional arguments would be needed for that particular conclusion.

This paper is an effort to put the theoretical argument on corruption to rights. Its impetus stems from the recognition that while the economics of corruption is strong on both empirical and applied counts, its theoretical

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basis is comparatively lacking. To improve on that, we seek to provide an auction-theoretic combination model in which both lobbying and corruption are captured as part of the same auction model.

One problem with this approach is that not even all acts of corruption are the same. We endeavour to provide a systematical perspective on that problem in the following sub-section 1.1, adding a short review of previous approaches in sub-section 1.2. Our own model shall be presented in section 2. The model will be solved by addressing the final subgame first (section 3) and then moving on to the first stage (section 4). Finally, we will sum up the results obtained in section 5.

1.1 Forms of corruption

Prior to any modelling decisions, it is useful to review the various forms that corruption can take as well as the areas in which it may occur. Table 1 overleaf summarises the various cases that we distinguish.¹ It turns out that important aspects of corruption games differ sufficiently to require different modelling strategies (game forms). We identify the form that we will be dealing with in our own model.

Investive corruption occurs when the client demands no specific *quid pro quo* at the time of making the present to the agent, but rather wants to ingratiate herself with her and establish general good relations. This category contains quite a few borderline cases of doubtful illegality, and is closely related to a fair number of customary activities in most countries, some of which may be demanded by etiquette. It is plausible that lobbying and investive corruption turn out to be complements as clients do favours in order to be admitted to the halls of power, where lobbying takes place.

Corruption with a direct *quid pro quo*, on the other hand, may be of either the “relieving” or the “extortory” kind (Pies and Sass 2008). The crucial question here is whether the client turns out to be better off than under the application of statutory law or not. If yes, the corruption is of the former type, if not, the latter situation obtains. The classical example for extortory corruption is a tax bureaucrat who demands his cut, threatening to classify the client’s tax return as fraudulent and prosecute unless a bribe is paid (Hindriks, Keen and Muthoo 1999).

These two forms of corruption require quite different modelling strategies as there is a conflict of interest between client and agent in one case, while harmony obtains in the other.

We define corruption to be of the “relieving” kind if the client’s utility is increased relative to the situation where the agent applies the law (or her contract with the principal) correctly, while “extortory” corruption obtains if the relationship with the agent is to the client’s disadvantage

¹See Lambsdorff (2007) for a plethora of examples and case studies.

Table 1: Forms and areas of corruption

	Time	Rationing	Regulation	Crime
Investive c.		building-up of (social) relationships without a direct <i>quid pro quo</i>		
Relieving c.	“Speed money”	Castles in Spain	Earthquakes in Turkey	
Extortionary c.	Intentional tardiness			(Hindriks et al. 1999)

(Pies 2003). The important modelling difference between the two is that in the case of extortionary corruption, the client has at least a constitutional interest in fighting and exposing the agent’s action. (She may, however, lack an action interest in doing so because of a public goods problem, as the costs of facing the agent are likely to be private, while the benefits accrue to similarly situated third parties (other clients) as well.) For this reason, the rule-maker, finding a natural ally in the client, faces a much easier job in the case of extortionary corruption. As a further corollary, extortionary corruption is more likely to be associated with corrupt hierarchies, i.e. games in which agents conspire with their superiors to elicit bribes. In the case of relieving corruption, on the other hand, we would expect to see conspiracies between the agent and the client exploiting their joint informational advantage over the principal, or the agent’s superiors. For policy, this may be a much harder nut to crack.

The columns in table 1 contain a classification of favours to be obtained by bribery, i.e. the *areas* of corruption, and have been arranged (from left to right) in order of increasing severity. The first column refers to the typical “speed money” case, where clients bribe agents to obtain faster service. The agent’s decision itself, however, remains the same as under lawful (correct) administration. If no one’s waiting time were lengthened on account of the bribe, because the agent just works harder (than specified in his contract with the principal), it is hard to argue that this does *not* constitute a Pareto improvement. The deal amounts to a private arrangement to pay for overtime, which improves the agent’s incentives, expands the client’s opportunity set, and leaves the principal as well off as before. The snag is that speed money can induce agents to work slower in the status quo in order to increase people’s willingness to pay for speedy treatment, moving us down a row into extortionary corruption. Or agents re-allocate their time budgets

to the detriment of non-payers, moving us right to the case of corruption aimed at rationing decisions.

Such “rationing” refers to the case where a limited number of licenses or permits are allocated by the agent, whilst “regulation” labels the case where the agent supervises the quality of some productive activity on the part of the client. The main difference here concerns the welfare losses that arise as a consequence of corruption: in the rationing case, we are essentially dealing with a typical Harberger triangle arising as a monopolistic entity (the agent) reduces quantity (the number of licenses) below the socially optimal level. There can also be technological externalities that depend on the *quantity* of the good produced – in fact, such externalities may be the reason for the existence of a licensing scheme in the first place –, in which case corruption turns out to be less bad than it would be otherwise as the reduction in quantity it brings about works “in the right direction” if one starts from the *laissez faire* solution.² All the same, the efficient output (number of licenses) will be reached only by chance.

In the “regulation” case, on the other hand, negative external effects depend not on the quantity of the good in question, but on its *quality*. Here the agent’s task is to supervise the client’s production process, and ensure that the product meets criteria specified in the contract with the principal. It is obvious that we need asymmetric information to coincide with incomplete legal enforcement *ex post* in this case if the client finds it in her interest to bribe the agent – otherwise, the principal would just sue the client for her loss, or in the case of the third party being affected, they would reveal the issue to the principal. These conditions appear to hold in a wide variety of cases, though, the most obvious being limits to the resources that courts can recover from either the client or the agent.

To fix ideas, think about building in the Mediterranean. Spanish resorts are famous for the number of “black” buildings being erected, often in defiance of regulations seeking to cut back on development or to confine it to certain areas. This “Costa Brava” kind of problem is an instance of the rationing type of corruption (in those cases where bribes were used to obtain, or to get along without, building permits). On the other hand, earthquakes in Turkey often caused new buildings to collapse with greater probability than older ones, an observation that has been attributed to corrupt officials tolerating building projects that are in violation of mandatory safety requirements.³ This exemplifies the regulation type of corruption.

²In fact, a corrupt régime can be welfare superior to prohibition. This would provide an instance of the well-known “greasing the wheels” type of argument (Méon and Sekkat 2005, Méon and Weill 2008), according to which corruption can be welfare-enhancing (or growth-enhancing) in the presence of disfunctional institutions.

³We owe this example to a presentation by Ingo Pies.

1.2 Bringing corruption and lobbying together

Irrespective of the wealth of distinct cases discussed above, most theorising on corruption relies on a standard model. The staple of this literature is the standard rent-seeking model as pioneered by Tullock (1967) and applied to corruption, among others, in Lambsdorff (2002). Starting from the seminal contribution by Grossman and Helpman (1994), corruption and lobbying have alternatively been modelled as auctions.⁴ However, this literature has so far treated rent-seeking and corruption in the same manner, applying one of the alternative models to both. The following quotations are representative of the standard approach:

“In many models [...] lobbying is modeled as monetary transfers from lobbyists to politicians and these transfers could equally be interpreted as campaign contributions or bribes.” (Campos and Giovannoni 2007)

“Candidates running for political office must decide how much to spend on their campaigns. We can consider this an auction, the single item being the political office, and with one winner. However, the winner [sic!] does not get a refund after the election; everyone who bids must pay. This kind of auction is called an all-pay auction. The same kind of auction models lobbying activity (Krishna 2002), and also bribery, for that matter.” (Steiglitz 2007)

In the light of the discussion in sub-section 1, such indiscriminate treatment does not seem appropriate. Neither do all instances of corruption share the same game form, nor can all of these forms be the analogue to a lobbying model. In the next section, we present a combination auction model in an attempt to redress this situation. We eschew covering all of table 1, however, so that the following model can only be considered a start.

2 The model

We consider the case of *relieving* corruption directed at a *rationing* decision. Recall that in the case of relieving corruption, clients are better off than under strict application of the law. This implies that losing bidders, i.e. clients who are not allocated a favour, need not pay their bribe.⁵ Lobbying efforts, on the other hand, resemble investive corruption in that interested parties pay contributions and expend effort with no certainty of a positive return. We think of them as directed at the principal (an anonymous “political process”), while bribery addresses a particular individual in the public service.

⁴Epstein and Nitzan (2007) provide a book-length comparison of the two approaches.

⁵We classify cases where the agent promises a quid pro quo, but reneges on that promise, as a form of extortion. Clearly, if clients make presents to ingratiate themselves with the agent(s) for as yet unspecified later, we have investive corruption. Analysis of both would require a slightly different modelling approach, which we relegate to a later paper.

To simplify the analysis, we restrict our attention to the simplest case with a single corrupt agent (the auctioneer) and n clients, who vie for a single indivisible resource, or favour – a monopoly right, for instance. Bribery is modelled as a standard FPSB auction, whereas we depict lobbying as an all-pay auction. The two run in parallel and are linked as follows: There is an endogenous probability of detection for the corrupt activity; if the agent and the winning client are caught, both are eliminated from the game and punished, and the prize accrues to the remaining client who lobbied the most. As bids and lobbying efforts increase monotonically in valuations, this will be the second-highest bidder. Otherwise, the agent effectively overrules the political process and allocates the prize to the highest bidder.

As is standard in auction theory, valuations \tilde{v} are private knowledge and independently drawn from a common distribution $f(v)$. We allow for the probability of detection p to depend on concealment effort by the agent, however, who maximises his expected utility from office (bribes received less fines paid). We take all players to be risk neutral for the remainder of this paper.

The resulting game consists of four stages:

1. A single public official (“agent”) chooses the level of concealment activities c , which in turn influence the probability of a corrupt deal being detected, $p = p(c)$ (with $p' < 0, p'' > 0$).
2. Individual valuations v are drawn from a common and known distribution $f(\tilde{v})$, but remain private knowledge.
3. n clients take p as a given and simultaneously decide how much to bid in the bribery b and rent-seeking r auctions, respectively.
4. Nature determines whether corruption is detected (with p) or not. If the agent and the winning client get found out, both are removed from the game and the agent faces a penalty σ while the client is fined a multiple sb of her original bribe. The favour is then allocated to the remaining highest bidder in the all-pay lobbying auction. Otherwise, the highest briber obtains the favour, the bribe is paid, and all payments into the lobbying auction are forfeit.

3 Solving the auction stage

The first step is to solve for a Bayesian Nash equilibrium in the second stage of the game. We follow standard practice (Binmore 2007, Steiglitz 2007) in looking for equilibrium bidding functions $b(v)$ and $r(v)$ maximising clients’ expected payoff in the bribery and lobbying auctions, respectively, while the client expects others to play according to the greek-lettered functions $\beta(\tilde{v})$

and $\rho(\tilde{v})$. In equilibrium, we must of course have $\beta = b$ as well as $\rho = r$. The expected utility of client i is

$$\begin{aligned} Eu &= F(\beta^{-1}(b(v_i)))^{n-1} ((1-p)(v_i - b(v_i)) - psb(v_i)) \\ &+ p(n-1) (F(\rho^{-1}(r(v_i)))^{n-2} - F(\rho^{-1}(r(v_i)))^{n-1}) v - r \end{aligned}$$

where $F(\tilde{v})$ denotes the cumulative density function (such that $F' = f$). The term $(n-1)F(\rho^{-1}(r(v)))^{n-2} - F(\rho^{-1}(r(v)))^{n-1}$ gives the probability of submitting the second highest bid, which is equal to the conditional probability of winning the all-pay auction, given that the highest bidder has been eliminated on account of being convicted of corruption. $F(\beta^{-1}(b(v_i)))^{n-1}$, on the other hand, is the probability of winning with a valuation of v_i using the (equilibrium) bidding functions. Using the fact that $(\beta^{-1})' = \frac{1}{\beta'(\beta^{-1}(b))} = \frac{1}{b'}$ in equilibrium, we obtain the following system of differential equations as our first-order conditions:

$$b' = \frac{((1-p)(v-b) - psb)(n-1)f(\bullet)F(\bullet)^{n-2}}{(1-p+ps)F(\bullet)^{n-1}} \quad (1)$$

$$r' = vp(n-1) ((n-2)F(\bullet)^{n-3}f(\bullet) - (n-1)F(\bullet)^{n-2}f(\bullet)) \quad (2)$$

In order to move forward and solve these, we need to specify the distribution of valuations $f(\bullet)$. However, for one special case a simple corner solution obtains.

3.1 $n = 2$: “wait & bribe”

Suppose there are just two bidders. In that case, the probability of receiving the rent in the lobbying subgame (of having submitted the second-highest bid) is Unity, regardless of r . It is therefore optimal not to bid in the all-pay auction ($r = 0$). Intuitively, both individuals wait to find out who wins the election, and then bribe her (“wait and bribe”). Note that this would also hold if a conviction did not lead to removal of the perpetrator from the game and other sanctions were insufficient to deter corruption completely.

With $r = 0$, the remainder of the auction stage degenerates to a standard two-person FPSB auction, with the added twist of the fine s . Note that (1) is independent of r , so this condition still characterises the solution here.

3.2 $n \geq 3$: the general case

Assume valuations \tilde{v} to be uniform i.i.d. over the domain $[0; 1]$. In this case, conditions (1) and (2) boil down to the following differential equations

$$b' = \frac{((1-p)(v-b) - psb)(n-1)v^{n-2}}{(1-p+ps)v^{n-1}}$$

$$r' = vp(n-1) \left((n-2)v^{n-3} - (n-1)v^{n-2} \right)$$

which we can solve to obtain:⁶

$$b(v) = \frac{(p + n(1-p) - 1)v}{n(1 + p(s-1))} \quad (3)$$

$$r(v) = p \left(\frac{n-2}{v} - \frac{(1-n)^2}{n} \right) v^n \quad (4)$$

3.3 Comparative statics

Armed with equations (3) and (4), it is straightforward to derive the comparative statics for the auction stage (given the u.i.i.d. assumption).

Lemma 3.1. *(Comparative statics in the third stage.) Increasing competition for favours (n) drives up the bribe, while harsher penalties (s) and increased policing (p) depress it. An increase in the probability of detection p promotes lobbying activity in an interior solution where a positive level of r obtains. The fine s has no cross-price effect on lobbying activity.*

Proof. Partially differentiate the closed-form solutions (3) and (4) with respect to the various parameters to find

$$\frac{\partial b^*}{\partial n} = \frac{v - pv}{n^2(p(s-1) + 1)} > 0 \quad (\text{note } s > 0)$$

$$\frac{\partial b^*}{\partial p} = -\frac{(n-1)sv}{n(p(s-1) + 1)^2} < 0$$

$$\frac{\partial b^*}{\partial s} = -\frac{(n-1)(1-p)pv}{n(p(s-1) + 1)^2} < 0$$

$$\frac{\partial r^*}{\partial p} = \left(\frac{n-2}{v} - \frac{(1-n)^2}{n} \right) v^n = \frac{r^*}{p}$$

$$\frac{\partial r^*}{\partial s} = 0$$

□

We fail to sign the comparative statics effects of additional competition on lobbying unambiguously. However, the remaining results tally well with intuition.

Note the asymmetry between fines and policing: whereas the latter entails an additional cost as it drives up legal rent-seeking, the former does

⁶Setting the integration constant to zero in all cases.

not. This result bolsters the Beckerian argument that *ceteris paribus*, fines are preferable as a means of deterrence to detection as they entail no social cost. Our model adds an additional dimension of social cost (the deadweight losses of lobbying as a substitute for corruption), and yet again, fines and detection turn out to differ with respect to these deadweight losses.

4 Solving the first stage: rational concealment

Let us now address the first stage of the game. We effectively assume that the politician-bureaucrat is interested in maximising his expected utility from the bribe (less the penalties), and that the bids in the all-pay auction are in fact lost.⁷ Remember that the bureaucrat-politician at this stage sets aside some part c of the bribe to invest in concealment activities, reducing the probability of detection $p(c)$ with $p' < 0$ and $p'' > 0$.

4.1 General solution

To begin with, bear in mind that the expectation of the *winning* bid is not identical to the distribution of the bribe b (or the valuation v) – after all, it is skewed upwards by virtue of the fact that this bid has outdone its competitors. The auction literature (Steiglitz 2007) informs us that the distribution of the winning bid is $g(v) = nf(v)F(v)^{n-1}$. As a corollary, the *expected* bribe received is $e(v, c) = \int b(v, c) nf(v)F(v)^{n-1} dv$.

The corrupt agent maximises

$$Eu(c) = (1 - p(c))e(v, c) - p(c)\sigma - c$$

The first-order condition for a maximum, assuming that $n > 2$ (such that there is no corner solution with respect to r), is

$$(1 - p)e_c - p'(e + \sigma) = 1 \tag{5}$$

where the LHS contains the various benefits of reducing the probability of detection at the margin, while the RHS reflect the marginal expected cost (a reduction in the expected bribe to be kept).

4.2 A special case

Again, the analysis is hard to move forward without further assumptions concerning the distribution $f(\bullet)$. If we use our old staple the uniform distribution, (5) becomes

⁷This is in keeping with the traditional rent-seeking literature. For intuition, note that in a fully employed economy all resources spent on election posters are indeed wasted – no-one really likes these things, and the same election result would presumably obtain if all parties reduced their respective efforts in proportion.

$$\frac{(n-1)s(p(c)-1)p'(c)}{(n+1)((s-1)p(c)+1)^2} + p(c) - 1 = p'(c) \left(-\frac{(n-1)(p(c)-1)}{(n+1)((s-1)p(c)+1)} - c + \sigma \right)$$

Additionally, let us assume that $p(c) = \frac{1}{(1+c)^\alpha}$ with $\alpha > 0$, where obviously $p(0) = 1$ and $\lim_{c \rightarrow \infty} p(c) = 0$. That is, corruption is discovered with certainty if no covering-up activities are undertaken, and the probability of detection goes to zero as infinite resources are devoted to cover-up activities. p does in fact have all the trappings of a probability, and it is easy to verify that we find $p' = -\alpha(1+c)^{-1-\alpha} < 0$ and $p'' = (1+\alpha)\alpha(1+c)^{-2-\alpha} > 0$ with the particular form specified.

The expected payoff of the corrupt agent now reads:

$$Eu(c) = \frac{(n-1)(1-(c+1)^{-\alpha})^2}{(n+1)(1-(1-s)(c+1)^{-\alpha})} - \sigma(c+1)^{-\alpha} - c \quad (6)$$

4.3 Comparative statics

Proposition 4.1. *(Comparative statics in the first stage.) Corrupt agents increase cover-up activities as a result of stiffer penalties σ . Competition for favours (increasing n) leads to higher corrupt effort c , ceteris paribus. If clients are punished more harshly (s increases), the effect can go either way. Given sufficiently high s , however, agents will devote less resources to camouflaging corruption, and the probability of detection increases as a corollary. The converse obtains for low penalties on clients.*

Proof. Differentiate (6) with respect to c and set equal to zero to determine the first-order condition for an interior maximum of (6). Then differentiate with respect to σ , n , and s to determine the sign of the comparative static effect.

$$\frac{\partial^2 Eu}{\partial c \partial \sigma} = \alpha(1+c)^{-1-\alpha} > 0$$

$$\frac{\partial^2 Eu}{\partial c \partial n} = \frac{2\alpha(c+1)^{-\alpha-1}((c+1)^\alpha - 1)((s+1)(c+1)^\alpha + s - 1)}{(n+1)^2((c+1)^\alpha + s - 1)^2} > 0$$

$$\frac{\partial^2 Eu}{\partial c \partial s} = \frac{(n-1)\alpha(c+1)^{-\alpha-1}((c+1)^\alpha - 1)\left(\left((c+1)^\alpha - 1\right)^2 - s\left((c+1)^\alpha + 1\right)\right)}{(n+1)\left((c+1)^\alpha + s - 1\right)^3}$$

To sign these expressions, recall that $(1+c)^\alpha$ is the inverse of a probability and therefore greater than unity, such that $(1+c)^\alpha + s - 1 > 0$. The sign of $\frac{\partial^2 Eu}{\partial c \partial s}$ depends on $\left((c+1)^\alpha - 1\right)^2 - s\left((c+1)^\alpha + 1\right)$, which is clearly positive for very small s (in particular, for $s = 0$) and negatively linear in s . \square

The third part of proposition 4.3 is particularly interesting as it promises a “double dividend” of anti-corruption measures targeted at the client: by reducing the expected benefit of bribing the bureaucrat, such measures put downward pressure on bribes, which makes it less attractive for agents to try and get them. The same mechanism drives the second result – as is well known from the auction literature, a seller’s expected revenue increases with the number of bidders, and this in turn will lead sellers to pay more for being able to run the auction in the first place (Pindyk and Rubinfeld 2008, Krishna 2002), all other things being equal.

4.4 Welfare implications

Finally, let us examine the welfare effects of anti-corruption measures (specifically, the levels of punishment σ and s) in our framework. We assume that s and σ are fines, such that they constitute pure transfers and do not reduce welfare.⁸ In keeping with the rent seeking literature (Bhagwati 1982), we take r to be a DUP activity and therefore a deadweight loss. For intuition, consider election posters or the wage of the marginal lawyer employed by a lobby group (given full employment).

The reason we take a rather benign view of corruption is that we neglect *variations in quantity and quality*. That is, we model competition for a single indivisible prize, and do not consider welfare losses that arise through monopolistic restrictions of licensing by revenue-maximising bureaucrats (Harberger triangles) or shoddy work authorised by corrupt quality inspectors (externalities) at this point. Still, the case where multiple clients vie for a single contract or favour is relevant (Stiglitz 1998, Lambsdorff 2007) and it serves as a useful theoretical point of departure.

4.4.1 Institutional corruption: c as a transfer

Analytically, the easiest case to tackle is where the camouflage activity consists in the agent’s forwarding part of the bribe to his superiors. This is often referred to as *institutional* corruption, which permeates the entire structure of the administration in question. In this case, not only do σ and s constitute pure transfers, but so does c .

Obviously, given our rather strong assumptions for this section, the most efficient (least cost) producer or, *mutatis mutandis*, the consumer with the highest willingness to pay can afford the largest bribe. It is therefore socially desirable that the highest bidder in the corrupt auction receive the prize.

To be precise, welfare in our model consists of the following three elements:

⁸Things would be different if we took σ and s to reflect imprisonment and informal social sanctions such as ostracism as well. These would lead to welfare losses; in this respect, we effectively *underestimate* the welfare cost of combating corruption.

1. With probability p , the individual with the second highest valuations gets the prize. The distribution of the second highest valuation is $(n-1)nvf(v)(1-F(v))$ (Steiglitz 2007, 187), with expectation $p \int_{-\infty}^{\infty} (n-1)nvf(v)(1-F(v))Fv^{n-2} dv$.
2. Otherwise, the highest bidder obtains the prize, with expected rent $(1-p) \int_{-\infty}^{\infty} nvf(v)F(v)^{n-1} dv$.
3. Finally, we lose the overall resources spent on lobbying, which is r aggregated over all types, or $-\int_{-\infty}^{\infty} f(v)r(v,p,\dots) dv$.

In the case of a uniform i.i. distribution over $[0, 1]$, where $f(v) = 1$ and $F(v) = v$, and given $n > 2$, social welfare boils down to

$$W = \frac{n^2 - 3p}{n^2 + n} \quad (7)$$

In deriving these results, note that bidders treat p as an exogenous variable. From the standpoint of society, however, p is a function of the three parameters n , s , and σ .

Proposition 4.2. (*Desirability of anti-corruption policies*) *An increase in the fine on clients s unambiguously decreases welfare, while a stiffening of penalties σ for agents increases it. The effect of the number of bidders n on welfare remains ambiguous in our model.*

Proof. Write $p = p(n, s, \sigma)$ in (7), differentiate with respect to the various parameters and use the results from proposition 4.3 to find:

$$\frac{\partial W}{\partial n} = \frac{n \left(n - 3(n+1) \frac{\partial p}{\partial n} \right) + (6n+3)p}{n^2(n+1)^2}$$

$$\frac{\partial W}{\partial s} = -\frac{3 \frac{\partial p}{\partial s}}{n^2 + n} < 0$$

$$\frac{\partial W}{\partial \sigma} = -\frac{3 \frac{\partial p}{\partial \sigma}}{n^2 + n} > 0$$

□

The intuition behind this is fairly simple. The first result is based on two effects:

1. Harder fines for clients make them bribe less, which in turn reduces the incentives for agents to engage in cover-up activities. As this increases the probability that a bribe will be found out, it also increases the likelihood that the prize will not accrue to its most efficient user (but rather to the second most efficient one).

2. Additionally, as the probability of being caught goes up on account of diminishing incentives for agents to invest in secrecy, lobbying becomes relatively more attractive for clients, which tends to increase r .

For σ , the mechanism is just the reverse of the one outlined above.

4.4.2 Costly cover: c as a deadweight loss

The above simple reasoning evidently fails whenever at least part of the concealment cost c qualifies as a deadweight loss – for instance, if resources are devoted to technical means of camouflaging communications, or if officials avoid conspicuous consumption.

Combining propositions 4.1 and 4.2, it is easy to demonstrate that allowing for expenditure on c to be a social loss will lead to more ambiguity: In the case of the penalty on apprehended agents σ , the comparative statics have the opposite signs, with the direct loss through c dampening the welfare gains from the indirect effect via p that is behind the intuition for proposition 4.2. The balance remains unclear. The more σ drives up wasteful concealment activity, however, the weaker our case for harsh punishment of corrupt agents.

In the case of stiffer fines on clients s , we cannot sign the comparative statics effect on c unambiguously, while the effect on the other components of welfare is clearly negative. This opens up the possibility that both effects work in the same direction, which would imply that a marginal *reduction* of penalties on corruption is socially desirable.

The overall political message from sub-section 4.4.1, which suggests that penalties on clients be substituted by penalties on agents, is obviously weakened by introducing c as another welfare loss.

5 Discussion

This paper does two things: First of all, we build an auction model that treats lobbying and corruption differently, in contrast to most of the literature, and that allows for differentiated punishment of agents and clients as well a camouflaging activity on the part of agents. A couple of interesting conclusions emerge, most prominently an asymmetry between the two penalties, which might be exploited to fight corruption more efficiently.

The second contribution is a formal argument in favour of a point raised by Besley (2006), namely that corruption, being essentially a transfer, can be a socially more efficient way to influence political decision-making than other forms of rent-seeking, in particular lobbying. As stimulating as it may be to argue across the grain of political correctness, however, one ought to be careful not to stress this point. Our model disregards important distortions wrought by corruption, such as the Harberger triangle of reductions in

quantity and the utility losses due to inferior quality of products in a setting with asymmetric information. (Of course, the question remains whether lobbying can have similar effects.)

In the present analysis, we focus on the standard case of relieving corruption (where both clients and agents benefit relative to the legal treatment baseline) and disregarded the other two types of corruption distinguished in section 1.1, extortionary and investive corruption. It is an obvious task for future work to extend, or to rework, the model in such a way that these cases can be analysed.

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