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Abstract

I model the connection between the equilibrium bribe amount and the fines imposed on both bribe-taker and bribe-payer. I show that Basu's (2011) proposal to lower the fines imposed on bribe-payers in order to induce more whistleblowing and increase the probability of penalizing corrupt government officials might instead increase bribe amounts. Higher expected fines on bribe-takers will make them charge larger bribes; at the same time, lowering fines for bribe-paying might increase bribe-payers' willingness to pay bribes.

Keywords: corruption, bribery, extortion, decentralization, fines.

JEL: H8, K4.

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Corruption when an inspector ignores the non-compliance with the rules for a bribe is known as *collusion*; corruption when the inspector requests a bribe from the compliant investor threatening to not affirm it as such is known as *extortion*. Kaushik Basu's proposal (Basu, 2011) to reimburse the bribe amount to the bribe payer, only in the case of extortion, to stimulate whistleblowing and facilitate the punishments of the extorters, was met with mixed enthusiasm. Drèze (2011) informally described a few ways in which Basu's proposal could backfire: for instance, decriminalizing corruption can lower the intrinsic ethical costs of dishonesty for bribe payers, which could lead to *more* bribes collected by the inspectors. But all these arguments assume that the bribe amount is inflexible. This paper uses a simple model that illustrates the direct connection between bribes and fines for corruption. I concentrate on extortion, and ignore collusion, to directly address Basu's argument. I show that increasing the corruption penalties for inspectors make bribes higher: the inspector wants to be compensated for his higher expected losses. I show that harsher corruption penalties for the payers *might* reduce the bribe: willingness to pay the bribe among investors goes down if they expect to pay penalties later. I therefore conclude that Basu's proposal, by ignoring the bribe formation mechanism, may backfire even without taking into account the choice between compliant and non-compliant investment, the ethical costs of bribery, participation decisions, and many other aspects that were raised by the literature.

Literature Review

The baseline model that I study in this paper is framed in Popov (2015), which shows that excessive bribe demands may exclude market participants from entering the market, worsening the outcomes for everyone, investors and corrupt inspectors alike. Among papers on a similar topic, Bliss and Di Tella (1997) argue that less participation may be better for the corrupt inspectors, because under less competition the market participants might enjoy the higher profits, which could be extracted. Konrad and Skaperdas (1998) tells a similar story about gangs that coerce cash from workshops; the difference from the current paper is that the gangs are obviously wasteful, whereas inspectors can prevent harmful projects, and it is beneficial to make them work, not to massacre them.

Combating corruption as a topic is well-represented in this literature as well. Rose-Ackerman (2010) provides a survey on past developments. In recent years, Konrad and Skaperdas (1998) asks what the police would do if it had society's welfare in mind: sometimes more policing leads to more gang activity. Polinsky and Shavell (2001) emphasize that every draconian law against corruption makes threats of framing for a violation of the very same law more intimidating, thus discouraging reporting. In a discussion paper, Basu (2011) argued that not punishing for coercion might increase transparency: those who were coerced would have no motivation to protect the corrupt. This proposal attracted some literature: Dufwenberg and Spagnolo (2015) shows that the costs of reporting matter, and suggests that the proposal would work better if the immunity were conditional on reporting, in the whistleblowing spirit of antitrust laws. Oak (2015) points out that Basu's proposal can motivate bureaucrats to stall the compliant projects, making more investors pursue projects in a non-compliant way, which is detrimental to welfare. Basu et al. (2016) is the closest to this very paper, trying to address the issue (following Mookherjee and Png (1995) and Drugov (2010)) by modeling the bribe formation process as a Nash bargaining outcome; one problem that they face is that the change in the fine translates to the change in the bribe one-to-one, making asymmetric fines as effective as symmetric. Whistleblowing is necessary in their framework to eliminate corruption. This is in stark contrast with my results: because I endogenize the equilibrium bribe amount without assuming bargaining, different fines have different effects on the equilibrium bribe amount, and the corruption can be suppressed and even shut down even if there's no effect on the probability of discovery of the act of corruption.

Experimental research confirms that not punishing for corruption improves the economic performance: Abbink et al. (2014) applies Basu's proposal regarding extortion bribes in the experimental setting, whereas Engel et al. (2012) studies the cultural differences in the efficiency of leniency program for collusion bribery, running experiments in different countries. Both agree that leniency increases reporting. Abbink et al. (2014) finds that retailiation by inspectors lowers the efficiency of Basu's proposal, suggesting the importance of anonymity for the whistleblower.

The Model

In a single period interaction, agents of measure 1 consume and invest a *numeraire* good. A positive mass of agents play the role of an *investor*: they come up with an idea of a project, and they implement it. A positive mass of agents play a role of an *inspector*: they must approve a project to continue before it can provide any profits to the investor. Inspectors and investors are paired at random. Each investor obtains the approval from one inspector.

Since inspectors are risk-averse, and the cases are not correlated, each inspector behaves as if he faces only one investor.

The inspector might ask the investor for a bribe. The inspector's taking a bribe to not reject a compliant project can be detected and successfully persecuted with probability q. The inspector's payoff is

$$(s - q\psi)P(s \text{ is paid}), \tag{1}$$

where ψ is the fine that the inspector pays if the corruption case is detected.[1]

The investor decides whether to pursue a non-compliant project and attempt collusion. Before deciding about whether to pay the bribe, the investor learns about the project's profitability R.Compliant projects return R for an investment of 1, where R is distributed on $[0, +\infty)$, with a cdf $F_R(\cdot)$, continuous pdf $f_R(\cdot)$, $\mathbb{E}R > 1$, and becomes observable at the point of deciding whether to pay the bribe. Since the investment happens before the bribe-paying decision, if the approval is not awarded, the investment is foregone[2].

The profit gained from going forward with the compliant project is then

$$\overbrace{E_R \max\left\{\underbrace{R - (s + q\phi)}_{\text{pay bribe}}, 0\right\} - 1}^{\text{net return}}. \tag{2}$$

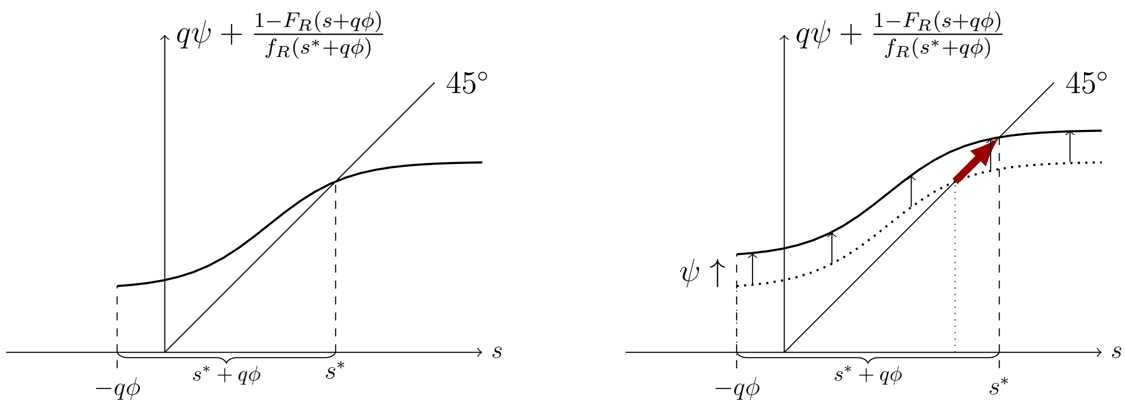
Here ϕ is the fine that the bribe giver pays if the corruption case is successfully detected and persecuted. The investor will start up his project if the net return of his project is positive.

Assumption 1. *All investors start up their projects: everyone's expected net return is positive.*

Popov (2015) argues that too large a bribe may preclude smaller investors from starting up their projects, with negative welfare implications. I abstract away from these issues here; these participation issues provide reasons to combat extortion, but for the purposes of this paper they will, if anything, amplify any movement of the bribe amount that is implied by our results here.

[1] In this specification, the fine is imposed if the project is implemented: the hypothetical legal system penalizes bribe paid under different conditions by the same fine, and cannot persecute anyone if the project is not implemented. Since outcomes are binary, setting the fine at 0 in case the project is not started up is a normalization. I assume q and ψ to be constant and not somehow connected to the bribe amount to emphasize that the whistleblowing effects, if any, are coming *in addition* to the effect of a change in the fine structure.

[2] If investments are partially recoverable, the investors have better negotiation power, which may lower the equilibrium bribe amount. See Popov (2015) for some results on this.



(a) Determining s^*

(b) Increase in ψ increases s^*

Figure 1: The effect of an increase in ψ

The inspector chooses the bribe s to maximize the expected bribe revenue from each investor he deals with:

$$s^* = \arg\max_s \overbrace{(s - q\psi)}^{\text{Expected bribe}} \underbrace{[1 - F_R(s + q\phi)]}_{\text{Probability of payment}}.$$

The first-order condition of this problem is

$$s^* = q\psi + \frac{1 - F_R(s^* + q\phi)}{f_R(s^* + q\phi)}. \tag{$\star$}$$

Further analysis would be very simple under the technical assumption commonly referred to as *Myerson's regularity condition* used in auction theory:

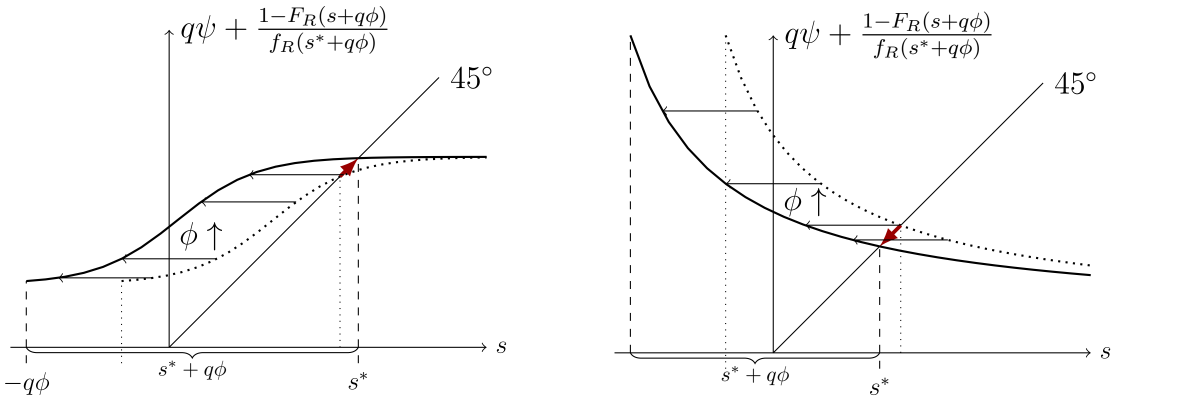
Assumption 2. $x - \frac{1-F(x)}{f(x)}$ *is increasing.*

The equilibrium bribe s^* solves the inspector's problem. The existence follows from Weierstrass' theorem as long as $E[R] < +\infty$. Figure 1a illustrates solving ($\star$).

Basu's Proposal

Fines ϕ and ψ simply shift the right-hand side of ($\star$): an increase in ψ moves its graph up, and an increase in ϕ moves it to the left. The behaviour of the intersection with a $45°$ line is therefore governed by the graph's local monotonicity near the intersection.

Result 1. *An increase in ψ increases s^*.*



(a) Increase in ϕ may lead to an increase in s^* (b) Increase in ϕ may lead to a decrease in s^*

Figure 2: The consequence of an increase in ϕ

The proof is immediate from Figure 1b; it does not depend on whether the right-hand side of ($\star$) is increasing or decreasing, but the uniqueness of the maximum implies that the crossing with a $45°$ line must be from above. The heavier punishment of inspectors will increase the bribe size: the corrupt will want compensation for the expected penalty.

This will lead to more projects aborted in the interim stage of bribe solicitation, which in the data will be seen as the occurrence of bribery going down. The takeaway message of this part is that in every fine structure that aims at lowering bribes, decreasing, not increasing, penalties for inspectors is necessary; being able to *pay* inspectors per project started up, having $\psi < 0$, might even induce the "no extortion" outcome of $s^* = 0$.

Result 2. *A marginal increase in ϕ will increase (decrease) the bribe if the right-hand side of* ($\star$) *is locally increasing (decreasing). In both cases, the total load on investors, $s^* + q\phi$, will increase.*

The reasoning is shown in Figures 2a and 2b. Two effects are at work here: on the one hand, larger penalties for participating in the unavoidable extortion lower the willingness to pay, driving the bribe down, but, on the other hand, a larger fine may work as a selection mechanism, making the average bribe-payer more likely to be of the larger R type, which increases the bribe amount. The dominance of the latter effect over the former will appear as a locally increasing right-hand side of ($\star$).

The total load result, demonstrated as a difference between the shift from the interval between two dotted vertical lines towards the interval between two dashed lines on both

Figures 2a and 2b, is obtained from the total differentiation of ($\star$) with respect to ϕ:

$$\frac{ds^*}{d\phi} = \overbrace{\left(\frac{d}{dt} \frac{1 - F_R(t)}{f_R(t)} \bigg|_{t=s^*+q\phi} \right)}^{\Phi} \left(\frac{ds^*}{d\phi} + q \right) \Rightarrow \frac{ds^*}{d\phi} + q = \frac{q\Phi}{1-\Phi} + q = \frac{q\Phi + q - q\Phi}{1-\Phi} = \frac{1}{1-\Phi}.$$

Φ in the equation above is the local slope of the right-hand side of ($\star$). If Φ is above 1, this means that the intersection of the right-hand side of ($\star$) is from below, not from above, the $45°$ line, going not only against the technical Assumption 2, but also against the assumption that we are dealing with a local maximum of (1).

An increase in q in my model is mathematically identical to an increase in both ϕ and ψ: Depending upon which effect dominates, better transparency might result in higher bribes.

Conclusion

While lowering the fine for the bribing investors may, in principle, lower the bribe amount, it may just as easily go in the opposite direction. Even in the most favorable scenario (there is no problem distinguishing corruption from extortion, there are no issues of participation, no ethical costs of whistleblowing or paying a bribe, etc), fiddling with fines for the payers might backfire: if one wanted to move extortion bribes closer to zero without imposing boil-you-in-oil laws against corruption, one way is to reward inspectors for started-up projects. There are obvious implementation issues (such as starting up projects just to collect the reward for approving started-up projects, see Khan et al. (2016) for one example of performance-pay scheme for tax collectors going awry), but at least there is no uncertainty about the response of the size of extortion bribes.

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