Does it matter who extorts? Extortion by competent and incompetent enforcers

Ajit Mishra
Andrew Samuel

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Ajit Mishra
Institute of Economic Growth
University of Delhi Enclave
Delhi, India
ajitm@iegindia.org

Andrew Samuel
Loyola University
Baltimore, USA
asamuel@loyola.edu

Abstract

Law enforcement officers can engage in two forms of corruption. *Bribery*, which arises when officers accept bribes from criminals, and *extortion* when officers demand payments from law-abiders. While bribery is mutually beneficial to both parties and therefore easy to explain, explaining extortion is more challenging because it only benefits one party; namely, the extortionist officer. The prior literature assumes that extortion is feasible because the enforcer can threaten to frame law-abiders. However, this requires the enforcer to already know whether the agent is a criminal or a law- abider. In contrast, this paper develops a model in which extortion occurs before the official has fully ascertained whether a suspect is a criminal or not. Specifically, officers choose whether to become competent or incompetent and incompetent enforcers cannot distinguish between criminals and law-abiding citizens while competent officers can. We show that incompetent officials can engage in extortion where law-abiders are forced to pay bribes along with criminals or harassment where law-abiders are investigated but not punished. Consequently, permitting extortion affects not only the level of crime directly but also officers' incentives to become competent, which in turn affects deterrence. Accordingly, in contrast to the prior literature we show that compliance in an equilibrium with more extortion is not always lower than one in which there is no extortion. Rather, what matters for policy decisions is *who* engages in extortion; that is, whether the competent or incompetent extort.

Keywords: Bribery, Extortion, Uninformed Officer
JEL: K4, K42, L5

1 Introduction

Corruption can undermine law enforcement because it allows non-compliant agents (criminals) to reduce their sanctions by paying a bribe (Becker 1968, Becker and Stigler 1974). The literature on corruption has identified two broad categories of bribes (Mishra, 2005). The first type occurs when law enforcers accept a (smaller) bribe instead of sanctioning or fining a criminal. This form of bribery is *collusive* since both the enforcer and the criminal stand to gain by engaging in bribery. The second type of bribery, which we term extortion, occurs when enforcers demand payments from compliant (henceforth, compliant) citizens. Extortion, unlike bribery is *non-collusive* since the compliant do not gain by making this payment.

Collusive bribery (henceforth, bribery) is relatively easy to explain since both the criminal and the enforcer stand to gain. For example in Mookherjee and Png (1995), or Polinsky and Shavell (2001) the bribe b must be less than or equal to f the fine that should be imposed on the violator, but greater than r the reward that the enforcer receives for reporting the violator. Similarly, in Samuel (2009) the enforcer gains by avoiding having to exert costly investigative effort. Thus, bribery is essentially a "Coasian side-payment" that benefits both parties. And, accordingly the bribe itself can be determined within a cooperative Nash bargaining framework. However, non-collusive bribery such as extortion is harder to explain because it is not clear why the compliant are willing to make extortion payments. Specifically, within a bargaining framework, the "threat point" of refusing a bribe should always yield a 0 payoff. Hence, intuitively the compliant should never yield to extortion.

Formal and informal analysts of bribery have offered two explanations that make it possible for extortion to occur, in both of which extortion rents are only extracted after the officer is informed about the citizen's actions or type - that is, whether compliant or not. Specifically, the first involves creating "hard" (verifiable) evidence to frame a compliant citizen (i.e. framing). That is, the officer exerts enforcement effort and observes whether agent is compliant or not. If compliant, the officer threatens to frame the citizen unless they are paid a bribe (Polinsky and Shavell 2001, Marjit et. al. 2000, Saha 2003). The second explanation involves suppression, as opposed to the creation, of hard evidence. Specifically, here upon exerting effort, the officer or supervisor observes the agent's true actions (compliant/not compliant) or nothing. If the supervisor finds that the agent is compliant he can threaten

to suppress that evidence to deny benefits to the compliant agents (Khalil et. al. 2010).[1]

This paper offers a third explanation for extortion - *incompetence*. In order to be effective at enforcement, we argue that law enforcers need to invest in costly human capital acquisition to become competent. Competence enables enforcers to more easily distinguish between criminals and compliant citizens. However, if an officer is incompetent he or she may "harass" a compliant agent by apprehending them. This may take the form of of detaining a compliant agent for questioning or a delay processing their permit, which is costly to the agent. Thus, the compliant may pay a bribe to avoid the threat of being harassed and its associated cost.

Such extortion due to incompetence differs from previous mechanisms of extortion in three critical ways. First, here extortion occurs (preemptively) during the investigative process and before it is known whether the agent is compliant or not. Second, because extortion occurs under imperfect information, the officer's extortionary demands could result in "screening." Finally, the possibility of extortion *itself* affects the officers' decision to become competent, which in turn affects the likelihood that extortion will occur. Since competence is generally desirable since it improves enforcement, extortion can affect the overall level of enforcement.

To study this issue we develop a model in which officers choose whether or not to become competent, and agents (citizens) choose whether or not to commit a crime. Becoming competent enables an officer to easily establish whether the agent is compliant or not. These officers can therefore take bribes or demand extortion payments in accordance with the standard framework in the literature. Incompetent officers, however, do not know whether the agent is compliant or not unless they detain and investigate the agent more extensively. Thus, both compliant and non-compliant agents are detained. Since detention is costly (for both compliant and non-compliant agents) even compliant agents are willing to make extortion payments to avoid being detained.

We find that extortion by competent officers has very different effects from extortion by incompetent officers. Specifically, we show that for a given level of policy parameters, the level of compliance may be higher when only incompetent officers extort than when only competent officers extort. However, if policy parameters can be chosen to implement a specific equilibrium, we show that a compliance maximizing regulator will always prefer to implement an equilibrium in which the *incompetent* extort to one in which the competent extort. Second, we find rather that an equilibrium with only bribery may yield a lower level

[1]For example, an official may deny a license to a firm that has complied with the regulation, and claim that it didn't observe compliance. See also Acemoglu and Verdier (2000).

of compliance than one with both bribery and extortion by the incompetent.

Both these results are noteworthy in light of the extant literature on corruption and extortion. Specifically, this literature argues that extortion should not be permitted because it weakens enforcement by reducing marginal deterrence.[2] However, these insights are drawn from models which assume that the enforcers choose whether to extort after becoming informed about the agent's guilt or innocence. The type of extortion present in the extant literature, therefore, translates to extortion by competent officers within our framework. In contrast, we acknowledge that uninformed (incompetent officers) may also extort, which as it turns out can have a positive effect on deterrence. Intuitively, because the incompetent do not know the compliance status of an agent, they indiscriminately extort both the compliant and the non-compliant. Although some compliant agents are thereby extorted (but are ultimately acquitted), criminals are also sanctioned and punished. Thus, extortion provides some deterrence, which would be lost when the incompetent do not extort. By ignoring the possibility that not all officers are equally competent and that extortion can be the product of such incompetence, the prior literature has overlooked this critical affect of extortion.

Besides these, there are other reasons why it is important to study the link between extortion and incompetence. First, empirically there is ample evidence that the threat of unnecessary harassment encourages compliant agents to yield to extortion demands (Gambetta 2009). Extortion by informed officers can be deterred by suitable incentive mechanisms or immunity regimes (Mishra and Samuel 2018), but it is harder to identify policies that deter extortion by incompetent officers. Second, in the context of bribery, preemptive bribery which occurs (under imperfect information) before the officer has exerted effort to observe the agent's type, has very different implications than standard (ex-post) bribery (which occurs after, and only if, the officer has ascertained that the agent is a violator) (Samuel 2009, Mishra and Samuel 2017, Motta 2009). Thus, it is natural and not surprising that extortion by incompetent (uninformed) officers has very different affects from extortion by competent officers.[3]

Our paper is organized as follows. Following the introduction, we set up the model with corruption. Then we analyze compliance under various types of extortion and bribery,

[2]See Mishra (2005) for a review of these issues.

[3]Our paper is also related to the literature on enforcement and judicial errors more broadly (Dharmapala and Miceli 2012, Png 1966). But, since in our framework courts cannot make type 1 errors, we do not discuss this literature explicitly.

followed by a brief discussion of policy response. The final section concludes.

2 The Model

Consider a model with two players: citizens (agents) and law enforcement officers (henceforth, officers). An officer then chooses whether to exert effort to become competent or not, $E \in \{0, 1\}$. The cost of becoming competent for an officer is e' where $e' \sim U[0, 1]$. A competent officer is perfectly informed about whether the agent is compliant or not.[4] The fraction of competent officers is θ, which is endogenous.

Agents choose whether to be compliant (law-abiding) or not (criminals), where $g' \sim U[0, G]$ is the distribution of gains from being non-compliant. An agent's choice to commit a crime is private information, unless the officer is competent (in which case the agent's guilt or innocence is observed by the officer). Accordingly, let α be the fraction of law-abiding agents. Then an incompetent officer's belief about the fraction of agents who are law abiding is α. For example, if an incompetent officer believes that about half the agents are not compliant, then when confronted with an agent he believes that with probability .5 the agent is non-compliant.

Given these beliefs, officers then choose whether to further investigate the agent which involves detaining the agent temporarily. If the agent is a criminal, the detention leads to information regarding the crime so that the agent is sanctioned f and the officer receives a reward of $r \leq f$ for reporting a criminal. Note that f may represent the expected fine, if the court system is imperfect and the possibility of a type 2 error is not zero. If a law-abiding agent is detained, she is eventually acquitted with certainty. However, acquittal comes at cost $k < f$ which may represent the legal fees associated with proving her innocence. We define the detention of a law-abiding citizen or agent as *harassment*.[5] Finally, an officer who wrongfully detains an law-abiding agent is penalized d.

Within the above framework we introduce bribery and extortion. An incompetent officer can demand a bribe b_i from agents. Since this officer is uninformed, law-abiding agents are

[4]This information is "soft" or unverifiable so that the officer is then free to continue the investigation or not.

[5]It is worth pointing out that the notion of harassment and incompetence can be applied in many other regulatory settings. For example, a competent consular officer can determine easily who should get a visa but the incompetent "harrass" by reporting and endless evidence seeking.

effectively being extorted by being asked to pay a bribe. Besides these extortive payments demanded by incompetent officers, a competent officer can demand a bribe b_c from a criminal (to avoid the fine f), or an extortion payment x from an law-abiding agent (to avoid being framed). These forms of bribery and extortion (by the competent) are similar to that found within the existing literature.

The timing of the game is as follows. We solve for the perfect Bayesian Nash equilibrium of this game.

1. Officers realize their cost of acquiring competence (e') and choose whether to invest in competence or not.

2. Agents realize (and privately observe) g' and then choose whether to be compliant or not based on their beliefs about the fraction of competent officers (θ).

3. An officer is randomly paired with an agent. Upon matching, the agent observes whether the officer is competent or incompetent. Subsequently, there are two possibilities depending on the competence of the officer.

    a. If the officer chose to be competent, the officer immediately knows whether the agent is compliant or not and can demand a bribe, b_c, or an extortion payment x (respectively), in exchange for not pursuing the investigation further. If the bribe is accepted, the game ends. If it is rejected, the officer chooses whether to detain and report the criminal, who then receives the sanction f. Similarly, if the extortion payment is made, the game ends. If it is rejected, the officer chooses whether to detain and report the compliant agent. The compliant agent incurs a cost k to prove her innocence and the offer incurs a penalty d for the wrongful detention (harassment).

    b. If the officer chose to be incompetent, the officer can detain the agent unless the agent pays b_i. If this bribe is paid, the game ends. If the agent refuses to pay a bribe, the officer chooses whether to detain and report the agent. If the officer reports the agent then non-compliant agents are sanctioned f and the officer receives r, while law-abiding agents incur a cost k to prove their innocence while the officer incurs a penalty d for harassment.

The above game permits four possible corruption profiles or scenarios, which we now identify:

- **No extortion:** Law-abiders do not get extorted or pay bribes. Non-compliant agents pay bribes to either competent and incompetent officers (depending on with whom they are matched).

- **Extortion by incompetent:** Only incompetent officers demand extortion payments from law-abiding agents, the competent and incompetent demand bribes from non-compliant agents.

- **Extortion by competent:** Only the competent officers extort, and the incompetent and competent officers demand bribes from non-compliant agents. **The incompetent harass the innocent who are forced to incur cost k to prove their innocence.**

- **Full extortion:** Both competent and incompetent officers demand extortion payments and take bribes.

Where necessary these corruption profiles are denoted by the subscript n (no extortion), xi (extortion by incompetent), xc (extortion by competent) and x (full extortion).

Before proceeding we wish to make two remarks concerning these corruption profiles. First, since the focus of this paper is on extortion, although bribery does occur in some profiles, we identify these profiles solely according to whether extortion occurs and who extorts (competent/incompetent). Second, not all of these corruption profiles may be equilibrium profiles.[6] Specifically, with regards to extortion, any extortion demand by the officer must be credible in the sense that given the officers (prior) belief that the agent is compliant, the threat of detention is credible. Thus, for a given α the threat of detention is credible if,

$$\alpha < \frac{r}{r+d}. \tag{1}$$

Further, the threat of detention must be credible (i.e. sequentially rational) off the equilibrium path. Specifically, if a bribe demand is rejected, then (in stage 3) upon rejection, given the officer's (posterior) beliefs about the fraction of law-abiders ($\hat{\alpha}$), the threat to detain the agent must be credible. That is, 1 must be satisfied given $\hat{\alpha}$. If this condition is violated then the threat of detention is not credible and consequently neither is the threat of bribery. Thus, the violation of this condition prevents some strategy profiles from equilibrium play, yielding the following result.

[6]Further, these profiles are not strictly strategy profiles since they do not specify the complete set of strategies for every sub-game.

Lemma 1 *If $d > 0$,*

a. there does not exist any (perfect Bayesian) equilibrium in which the competent officer extorts,

b. extortion can take place, by the incompetent officer, but there is no equilibrium where the compliant and non-compliant agents are extorted to different extents.

Proof. First, since the competent immediately observe an agent's type, (a) follows trivially. Specifically, consider the case where the competent officer demands $x > 0$. Such a demand is not credible since if the compliant citizen were to reject it, the officer would not investigate further since his (expected) payoff is $-d$.

Next consider claim (b) that an incompetent officer demands $k < x \leq f$. Such a demand will be accepted by the non-compliant but rejected by the compliant. Clearly, in this case the officer's posterior belief about the agent is $\hat{\alpha} = 1$. But, this in turn implies that the officer should not detain the agent when d is positive since he believes that he will receive $-d$ with certainty. This in turn implies that a non-compliant citizen will chose to deviate and reject the bribe demand. Hence, such an equilibrium cannot exist with $d > 0$. If $d = 0$, then an incompetent officer can credibly demand a bribe payment $b_i = f$ because the threat to detain the agent is credible regardless of whether such a bribe demand is accepted or rejected. ■

Inter-alia, lemma (1) reveals the critical importance of d in determining the possible equilibria. Specifically, whether a competent officer extorts depends on whether or not d is positive. Given the importance of this parameter, it is worth contextualizing it further before proceeding to identify the equilibria of our framework.

The parameter d may be viewed as the sanctions for harassment (or more broadly sanctions for committing type-1 errors). These sanctions may be internal penalties, loss of promotions, etc., or external if imposed by a strong system of torts.[7] Given lemma (1) this typology, without (with) immunity with $d > 0$ ($d = 0$), is used to characterize the equilibria of our game in the next two subsections.

[7]Of course, in many jurisdictions officers enjoy considerably immunity from committing type-1 errors. This issue is analyzed in depth in Mishra and Samuel (2017) who do not consider the relationship between bribery and extortion relate to competence and immunity polices.

2.1 Bribery and Extortion without immunity

First consider the case without immunity so that $d > 0$. Since $d > 0$ we know from Lemma 1 that only the incompetent will extort (if at all). Extortion by the incompetent is in some sense done out of "ignorance" because they do not know whether a citizen is compliant or non-compliant, and therefore, they demand a bribe b_i from both compliant and non-compliant citizens. From lemma (1) we know that the incompetent do not screen, hence if the compliant pay bribes, b_i must equal k. Finally, lemma (1) also implies that $b_c = f$ when $d > 0$. Hence, let $b_c^* = f$ and $b_i^* = k$. Accordingly, demanding a bribe is incentive compatible for the incompetent if, given their (equilibrium) beliefs concerning the fraction of compliant agents α,

$$k \geq r - \alpha(r + d) \tag{2}$$

When condition (2) is satisfied, both compliant and non-compliant agents will accept the bribe demand from the incompetent officer, and the non-compliant will accept the bribe demand from the competent officer. Hence, a citizen who gains g from committing the crime will choose to commit a crime if and only if,

$$g' - \theta f - (1 - \theta)k \geq -(1 - \theta)k$$

Using g to denote the marginal citizen who is indifferent between compliance and non-compliance, the previous equation simplifies to,

$$g' \geq \theta f \equiv g. \tag{3}$$

Since the compliant pay k only when they encounter an incompetent agent, and the non-compliant agents pay a fine f in the form of a bribe, enforcement is diluted to the extent the fraction of competent officers fall short of 1.

Turning to the officers' competence decisions, an officer with cost e' chooses to become competent if and only if,

$$(1 - \alpha)f - e' \geq k.$$

Using e to denote an officer who is indifferent between becoming competent and remaining incompetent, the previous equation simplifies to,

$$e' \leq (1 - \alpha)f - k \equiv e. \tag{4}$$

Equations (3) and (4) allow us to characterize the best responses of the citizens and officers, where given our distributional assumptions $\theta = e$ and $\alpha = g$. Let $\gamma_{xi}(e)$ represent

the citizens' best response to the officers' competence choices, then from (3)

$$\gamma_{xi}(e) = ef.$$

Similarly, let $\epsilon_{xi}(g)$ represent the officers' best response to the citizens' compliance decisions. Then from (4) it follows that,

$$\epsilon_{xi}(g) = (1 - \frac{g}{G})f - k$$

These best responses are graphed in figures 1 and 2.

Alternatively, if condition (2) is violated then the incompetent choose not to extort. Note that a necessary condition for this equilibrium to arise is $r > k$. [8] In this case citizens commit a crime if and only if,$g' - f\theta - (1-\theta)f \geq -(1-\theta)k$, or

$$g' \geq f - (1-\theta)k \equiv g_n. \tag{5}$$

Similarly, in this case an official chooses to become competent if and only if,

$$\alpha(-d) + (1-\alpha)r \leq \alpha(0) + (1-\alpha)f - e'$$

or,

$$e' \leq (1-\alpha)(f-r) + \alpha d. \tag{6}$$

Equations (5) and (6) can be used to characterize the best response of the citizens and officials when the incompetent do not extort. Specifically,

$$\gamma_n(e) = f - (1-e)k$$

and

$$\epsilon_n(g) = (1 - \frac{g}{G})(f-r) + \frac{g}{G}d.$$

Using these best responses, we now characterize the equilibrium in this case where informed officers do not extort.

Proposition 1 *Depending on the value of d incompetent officers may choose to extort in equilibrium.*

[8] This condition is implied when condition (2) is violated because when (2) is violated, $r > k$.

a. If d is neither too small or large, specifically if

$$d \in [\frac{r(kf+G)-kf^2-kG}{f(f-k)}, \frac{r(kf+G)}{f(f-k)}] \equiv [d_2, d_1]$$

then we have a ***Incompetent Extortion*** *equilibrium in which competent officers demand bribes $b_c = f$ and incompetent officers demand $b_i = k$ from both compliant and non-compliant agents, and the equilibrium levels of compliance and competence are*

$$g^*_{xi} = min\{\frac{Gf(f-k)}{G+f^2}, f\}$$

$$e^*_{xi} = min\{\frac{G(f-k)}{G+f^2}, 1\}.$$

b. If

$$d \leq \frac{r(G-f+k)-k(G+k(f-r))}{(k+1)(f-k)} \equiv d_3$$

then we have a ***No Extortion*** *equilibrium in which only the competent demand a bribe $b = f$, and the incompetent officers detain both compliant and non-compliant citizens so there is harassment but no extortion. In this equilibrium, the equilibrium level of compliance is,*

$$g^*_n = \min\{\frac{G(f-k+k(f-r))}{G+k(f-r-d)}, f\}$$

$$e^*_n = \min\{\frac{G(f-r)-(f-k)(f-r+d)}{G+k(f-r-d)}, 1\}$$

Proof. The solution to $\gamma_{xi}(e)$ and $\epsilon_{xi}(g)$ yield g^*_{xi}, e^*_{xi}. If the value of e at this solution is greater than 1, then $e^*_{xi} = 1$ and $g^*_{xi} = f$. In this case, the equilibrium occurs at a "corner." Assuming an interior solution, the equilibrium beliefs that result from this solution must also satisfy (2) and (1). That is, at $\alpha = \frac{g^*_{xi}}{G}$

$$(1-\alpha)r - \alpha d \leq k$$

and also satisfy (1). These two conditions require that,

$$\frac{r}{r+d} \geq \frac{g^*_{xi}}{G} \geq \frac{r-k}{r+d}.$$

Or,

$$\frac{r}{r+d} > \frac{f(f-k)}{G+f^2} > \frac{r}{r+d} - \frac{k}{r+d}.$$

Solving for d in the chain of inequalities yields the upper and lower bounds on d in part (a) of this proposition. If instead the solution is interior, then the following chain of inequalities must be satisfied instead,

$$\frac{r}{r+d} \geq \frac{f-k}{G} \geq \frac{r-k}{r+d}.$$

When $k \geq (1-\alpha)r - \alpha d$ is violated in equilibrium then $\gamma_n(e)$ and $\epsilon_n(g)$ determine the equilibrium values e_n^* and g_n^*. If the value of e is greater than 1 at this solution, then $e_n^* = 1$ and $g_n^* = f$. For this pair to be an equilibrium it must satisfy the requirement that,

$$k < (1-\alpha)r - \alpha d$$

at g_n^*, which yields,

$$d \leq \frac{r(G-f+k) - k(G+k(f-r))}{(k+1)(f-k)} \equiv d_3$$

Clearly, both sets of conditions on d may be satisfied simultaneously, in which case there will be multiple equilibria. ■

Four insights can be gleaned from this proposition. First, if d is sufficiently large, then neither bribery nor extortion arises in equilibrium because the threat of an arrest or detention as implied by condition (1) is not credible. Hence, these two equilibrium arise only when d is positive but not too large. Second, if $d < \frac{r(kf+G)}{f(f-k)}$, then there always exists a range over which an incompetent officer extorts. Note that since $f > k$, the right hand side of this inequality is always positive. Thus, as long as d is in a small positive neighborhood of 0, the incompetent will extort and the competent will demand bribes. However, third, even for small positive values of d the existence of the bribery equilibrium is not guaranteed. Specifically, observe that $d_1 > d_2$, but d_2 andd_3 may be either positive or negative. Indeed, if G is sufficiently small then both d_2 and d_3 are negative so that a incompetent extort equilibrium exists (and is the unique equilibrium) for all $d < d_1$ and a bribery equilibrium never arises. Fourth, multiple equilibrium may arise for some range of d. For example, if $d_1 > d_3 > d_2$, then the Incompetent Extortion equilibrium is unique for $d \in [d_3, d_1]$, and bribery equilibrium is unique for $d < d_2$ and for $d \in [d_3, d_2]$ both equilibria arise.

An important implication of the previous set of insights that compliance will not vary monotonically or continuously in d. Specifically, in the bribery equilibrium compliant agents are harassed by incompetent (and must pay k to prove their innocence) whereas in the Incompetent Extortion equilibrium k is extorted from them. Thus, they pay k regardless of which equilibrium arises. However, d has a different impact in each equilibrium because in the former the incompetent harass the compliant and so incompetent officers incur d

on the equilibrium path, whereas in the later (Incompetent Extortion equilibrium) d never incurred (in equilibrium). Thus, while d impacts the equilibrium level of compliance in bribery equilibrium it does not do so in the Incompetent Extortion equilibrium. Accordingly, compliance may rise or fall with d. We study this issue more explicitly in section 3.

2.2 Bribery and Extortion under full-immunity

We now consider the case where $d = 0$. Because the officer does not face any penalty for reporting a compliant agent condition (1) satisfied for any $\alpha \leq 1$. Hence, detention is always a credible threat. Consequently, an informed (competent) officer can now demand $b_i = f$ and $x = k$ from a law-abider (extortion) and both of these players will accept these bribe demands since the threat to report even a compliant agent is now credible. Uninformed officers may now choose $b_i^* = f$ or $b_i^* = k$, since Lemma 1 shows that $b_i \neq f$ only when $d > 0$.

First, we examine an equilibrium where $b_c^* = b_i^* = f$ and $x = k$. All non-compliant agents accept this bribe since they are weakly indifferent, and all compliant agents reject this bribe when they encounter an incompetent officer (and are reported to the court). Thus, this is *Competent Extortion* equilibrium where only the competent officers extort the payment k, while the incompetent do not extort but instead detain (harass) the compliant agents and take bribes from the criminals.

In this Competent Extortion equilibrium, a citizen chooses not to comply if

$$g' - \theta f - (1-\theta)f \geq -\theta k - (1-\theta)k. \tag{7}$$

Similarly, an officer chooses to become competent if,

$$(1-\alpha)\, f + \alpha k - e' \geq (1-\alpha)\, f. \tag{8}$$

Instead, suppose the incompetent officer demands k, then both non-compliant agents and law-abiders accept this bribe demand. Hence $b_c^* = f$ and $b_i^* = k$ and all agents pay either a bribe or an extortion payment, and there is complete extortion. In this *complete extortion* equilibrium, a citizen chooses not to comply if,

$$g' - \theta f - (1-\theta)k \geq -k \tag{9}$$

and an officer chooses to become competent,

$$(1-\alpha)f + \alpha k - e' \geq k. \tag{10}$$

Equations (7), (8) and (9), (10) respectively characterize the competent extortion and complete extortion equilibria. These equilibira are characterized in the following proposition.

Proposition 2 *If $G > f$, then there exists a* ***Competent Extortion*** *equilibrium where competent officers extort k from compliant agents while incompetent officers do not extort, and competent and incompetent officers receive a bribe $b_c = b_i = f$ from non-compliant agents, and the equilibrium levels of compliance and competence are,*

$$g^*_{xc} = f - k$$

$$e^*_{xc} = \frac{f-k}{G}k.$$

If $G \leq k(f-k)$, then there exists a ***complete extortion*** *equilibrium where the competent and incompetent officers extort k from compliant agents, competent officers receive a bribe $b_c = f$ from non-compliant agents, and the equilibrium levels of competence and compliance are,*

$$g^*_x = \frac{G(f-k)^2}{(f-k)^2 + G}$$

$$e^*_x = \frac{G(f-k)}{(f-k)^2 + G}.$$

Proof. Given our distributional assumptions $\theta = e$ and $\alpha = g$ so that the solution to equation (7) and (8) determine the best responses of the citizens and the officers in the Competent Extortion equilibrium as follows:

$$g_{xc} = f - k$$

$$\epsilon_{xc} = \frac{g}{G}k.$$

These best responses are graphed in figures 3. The solution to these two best responses determine the equilibrium values in part (a).

For the incompetent agent to demand $b_i = f$ in equilibrium (over $b_i = k$), $(1-\alpha)f \geq k$ at the equilibrium value of α. This requirement simplifies to,

$$G > f.$$

This completes the proof of part (a).[9]

[9]Note that for any given α, $(1-\alpha)f > (1-\alpha)r$, so demanding a bribe of f always dominates demanding a bribe of r.

Next consider the case where $b_i = x$ in equilibrium. In this case (9) and (10) yield the best responses:

$$g_x(e) = e(f - k)$$

and

$$\epsilon_x(g) = (1 - \frac{g}{G})(f - k).$$

The solutions to these two best responses yield the equilibrium values in (b) and are graphed in figure 4. These equilibrium values must be incentive compatible for the incompetent officer in the sense that at these values $(1 - \alpha)f < k$ to ensure that $b_i = k$ is chosen over $b_i = f$. Substituting the equilibrium values of g and e into this condition yields,

$$G \leq (f - k)k.$$

■

Proposition 2 offers several insights into the equilibria with full immunity. First, recall that $G > f$ by assumption. Hence, when $d = 0$ an equilibrium in which the competent extort always exists. Indeed, when $d = 0$ if $f > (f - k)k$ then this equilibrium in which only the competent extort is the unique equilibrium. Instead, if $(f-k)k > f$, then if $G \in [(f-k)k, f]$, then both the complete extortion and incompetent bribery equilibrium co-exist. Thus, the complete extortion equilibrium is never unique. Third, note that in the complete extortion equilibrium the only value from competence is reducing harassment.

3 Policy Analysis

The equilibria identified in the previous section clearly depends on key policy parameters such as d and f, inter-alia. Hence, by choosing these parameters a regulator can implement different equilibrium and affect the overall level of compliance and competence. This raises several policy questions. First, will a compliance maximizing regulator want to eliminate bribery or extortion (when extortion is due to incompetence)? Second, which equilibrium (from propositions 1 and 2) will a compliance maximizing regulator wish to implement? Third, does it matter whether the extortionist is competent or incompetent?

To begin to address these questions, we first compare the levels of compliance across these four regimes in the following proposition.

Proposition 3 *a. Compliance in the Incompetent Extortion equilibrium need not be lower than compliance the No Extortion equilibrium.*

b. *Compliance is always higher in a Competent Extortion equilibrium, than in a Complete Extortion equilibrium*

Proof. We prove these two claims by construction:

a. Consider a case where $d_2 < d_3 < d_1$. Note that this case occurs as long as $r > k$ and if k is sufficiently small. Then *given some set of parameters* r, f, k, and $d \in [d2, d3]$ both the Incompetent Extortion and the No Extortion equilibrium co-exist. However, by construction the level of compliance in the Incompetent Extortion equilibrium must satisfy,

$$\frac{r-k}{r+d} < \alpha < \frac{r}{r+d},$$

and the level of compliance in the No Extortion equilibrium must satisfy,

$$\alpha < \frac{r-k}{r+d} < \frac{r}{r+d}.$$

Thus, the level of compliance in the No Extortion equilibrium is lower than the level in the Incompetent Extortion equilibrium. Note that while this is true for a given set of parameters, for a different set of parameters the level of compliance in the No Extortion equilibrium can be higher than in the Incompetent Extortion equilibrium.

b. Consider a set of a parameters with $d = 0$. Compliance in the Competent Extortion equilibrium is $f - k$ whereas in the Full Extortion equilibrium is $\theta(f - k) < (f - k)$.

■

It is worth making a few remarks concerning the intuition of this result. The reason compliance need not be higher without extortion than with incompetent extortionists (proposition 3 (a)) is due to two counteracting effects. The first effect is the standard "marginal deterrence" effect. Namely, in the No Extortion equilibrium, marginal deterrence is stronger compared to the Incompetent Extortion equilibrium because the compliant are not extorted. Therefore, the incentive to comply is stronger in the No Extortion equilibrium (relative to the Incompetent Extortion equilibrium). However, second, for the No Extortion equilibrium $r(1 - \alpha) - \alpha d > k$ (i.e. (2) is violated), which implies that even when the officer is not competent payoffs are high. Thus, the incentive to become competent is lower. Since competence raises compliance, this second effect weakens incentives for compliance in the No Extortion equilibrium (relative to the Incompetent Extortion equilibrium). If this second effect is stronger then an equilibrium without any extortion (proposition 1 b.) may result in

lower compliance than one in which the incompetent extort (proposition 1 a).[10] Thus, while prior results in this literature suggest that eliminating extortion is beneficial because doing so raises compliance, here the level of compliance in an equilibrium in which the incompetent extort may be higher than one without extortion (proposition 3 (a)) .

It is also possible to compare the equilibrium in which the competent extort (proposition 2 (a)) to the case where only the incompetent extort (proposition 1 (a)). To do so, consider two societies in which the parameters r, f, k are identical but one in which $d = 0$ and another where $d > 0$. Note that in the former, Competent Extortion equilibrium the level of competence has no impact on compliance because the non-compliant always incur f and the compliant always incur k regardless of whether they encounter a competent or incompetent officer. However, when only the incompetent extort, the level of competence does increase compliance, because fewer incompetent officers reduces the costs (from extortion) of compliant agents. But because the incompetent can extort, the incentive for competence is weaker. Thus, if there are few competent officers, compliance may be lower in the Incompetent Extortion equilibrium (proposition 1 a) relative to the Competent Extortion equilibrium (proposition 2 a). Accordingly, from a compliance standpoint it is not always clear whether extortion by the incompetent is worse than extortion by competent officers. Or equivalently, it is not clear whether an equilibrium when $d = 0$ will yield a higher level of compliance than one where $d > 0$ in which only the incompetent (may) extort.

Although for a given set of parameters compliance may be higher or lower when $d = 0$ relative to when $d > 0$, it can be shown that the highest level of compliance (i.e. the maximal element) in a regime without immunity ($d > 0$) is always greater than the highest level of compliance with full immunity ($d = 0$). The following proposition characterizes this result.

Proposition 4 *For any given regime with full immunity, there exists another regime without immunity in which compliance is higher.*

Proof. First, consider the function $\gamma_\rho(e)$ for $\rho = \{xi, n, xc, x\}$. Observe that the highest achievable level of compliance in the equilibria where $d > 0$ is f, which is always greater than the highest achievable compliance when $d = 0$ (which is $f - k$). To ensure that such

[10]The intuition here can be obtained by noting that as $k \to f$, the best responses for the agents is the same in both regimes, but the incentive for incompetence in the extortion regime is lower because the enforcer can get k without exerting effort. Thus, compliance is lower in the extortion regime than in the bribery regime, when $k \to f$.

an equilibrium can always be implemented, consider a regime with $d = 0$ with compliance $g \leq f - k$. Comparing this level of compliance to one where $d > 0$ so that d is in the range specified in proposition 1 (a). Recall that this range is always non-empty so that such a d can always be chosen. This d implements the Incompetent extortion Equilibrium so that $e^* = e^*_{xi}$. Next choose f so that $G + f^2 > G(f - k)$. Then compliance in this new regime is f which must be higher than the level of compliance at $d = 0$. ■

An immediate implication of this proposition is that *if a regulator could implement a policy, it would choose to implement the one in which $d > 0$ so that only the incompetent extort, if at all rather than one in which the competent extortion.* The intuition behind this striking result is worth exploring.[11] When only the incompetent extort, the negative effect of extortion can be eliminated by raising competence. But, when the competent extort then raising competence cannot eliminate extortion and its associated detrimental effect on compliance. Thus, extortion by the incompetent is the "lesser of the two evils."

Finally, we turn our attention to some key comparative static results.

Proposition 5 *In all 4 equilibria, compliance is increasing in f and decreasing in k. Compliance is increasing in d only in the bribery equilibrium, in all other cases it is unaffected by d.*

The results concerning f and k are straightforward within the context of the standard enforcement framework. The effect of d, however, is more interesting. When extortion occurs, then penalties to officers who harass compliant agents never matter, hence d does not effect compliance or competence. Thus, it is only when extortion never occurs (i.e. the No Extortion equilibrium), that d can affect compliance. However, interestingly, when d is large then the No Extortion equilibrium becomes less likely, in which case again d has no affect on compliance. Thus, it suggests that penalties for harassment need to constructed carefully in order to make them effective.

4 Conclusion

This paper offers a model in which extortion occurs before the officer has determined whether an agent is non-compliant or compliant, in contrast to the rest of the literature where extor-

[11] The result here is similar to a "domination theorem" due to Dasgupta and Maskin (2008), in the context of selecting voting rule. Similarly, Mishra (2002) also, the maximal elements of different hierarchical structures are compared, while choosing optimal enforcement policies.

tion occurs after and only when the officer has determined whether the agent is compliant. Here officers can make credible threats to extort because they have the ability to apprehend and detain agents (both criminal and compliant) during the investigative process. As long as there is some cost to apprehending compliant agents, competent officers never extort. Incompetent agents, however, do not observe the agent's compliance decisions. Thus, they can commit to further investigate the agent if their beliefs that the agent is non-compliant are sufficiently high. Since this investigative process incurs a cost on agents (even when they are compliant), which we refer to as "harassment," compliant agents are willing to make an extortion payment to avoid these costs. Thus, extortion occurs even though the officer cannot frame the agent in contrast to Polinsky and Shavell (2001) or Khalil et. al. (2010).

The main implication of allowing extortionists to be either competent or incompetent is that the prevalence of extortion depends on whether the officer has chosen to become competent. Furthermore, extortion itself will affect the decision of the officer to become competent, which may have long term effects on compliance. This result is particularly interesting in light of Gambetta's (2009) empirical study which finds that corrupt bureaucrats often chose to be incompetent at their work in order to prove to non-compliant agents that they "lack better alternatives," and therefore will not renege on heir corrupt transactions. While we do not explore this angle explicitly (i.e. hold-up), our model suggests that extortion (in addition to bribery) will affect the officer's decision to become incompetent.

Our model offers insight regarding whether extortion, bribery, or harassment is the lesser or worse of the three evils. Polinsky and Shavell (2001) find that while framing should be punished, extortion should not (because doing so results in more framing which generates worse outcomes with regard to compliance). In the current context harassment is similar to framing. Thus, when d is large harassment is punished, and in this case only the incompetent extort and bribe k while the competent demand a bribe f. However, as proposition 3 shows a No Extortion equilibrium (with harassment) could yield a higher level of compliance than a Incompetent Extortion equilibrium. Thus, when harassment is the result of incompetence, and extortion affects competence decisions, allowing extortion need not be worse than allowing harassment.

Our paper also offers insight into whether extortion by competent officers is worse than extortion by the incompetent, an issue that has not yet been investigated in this literature. As we show in proposition 4, compliance can always be raised by eliminating extortion by the competent, while allowing extortion by the incompetent. Accordingly, when choosing to

permit either competent and incompetent extortionists, somewhat surprisingly, incompetent extortionists are the lesser of the two evils. Thus, extortion by uninformed (incompetent) officers presents very different issues than the type of informed (competent) extortion that has been studied in the extant literature.

We conclude by offering a few thoughts regarding the limitations of our paper and ideas for extending this work. First, we assumed that the officer always demands a bribe. However, bribes may instead be offered by the citizen. When the citizen can offer a bribe, the bribe becomes a signal of the agent's compliance, therefore, the game becomes a signaling game. As is well known signaling games admit several equilibria, however, in an appendix we show that only one equilibrium survives the divinity criterion.[12] Second, our analysis focused on compliance maximization and did not consider welfare maximizing policies. A-priori it is not obvious whether welfare maximization implies that $e^* = 1$. Indeed, the presence of extortion by the incompetent may imply that the solution to the regulator's maximization problem is less than full competence by officers (i.e. $e^* < 1$). Intuitively, when $e^* < 1$ competence costs are lower than when $e^* = 1$ and further since even the incompetent do sanction some criminals they do provide some deterrence, but at a lower cost than the competent. Thus, a welfare maximizing regulator may favor a less-than-fully competent bureaucracy, which further implies that consistent with our findings that it may be optimal to allow the incompetent to extort. We leave it to future work to study the relationship between welfare maximization, competence and corruption more closely.

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5 Figures

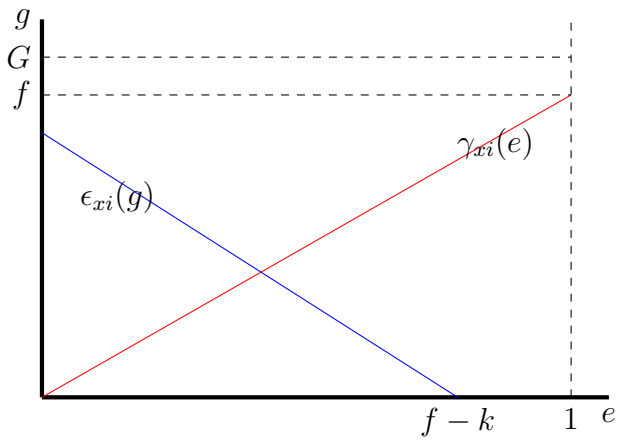

Figure 1: Incompetent Extortion equilibrium

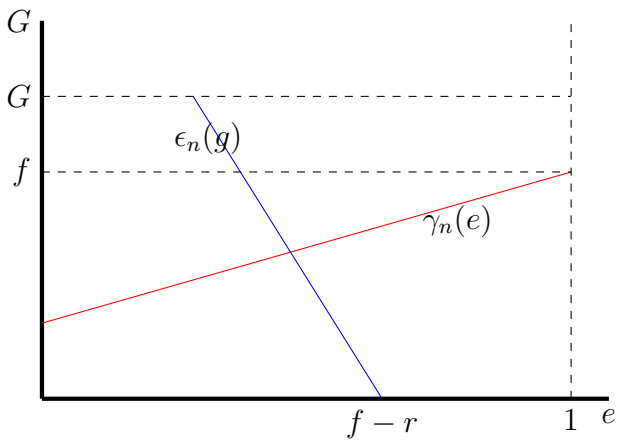

Figure 2: No extortion equilibrium .

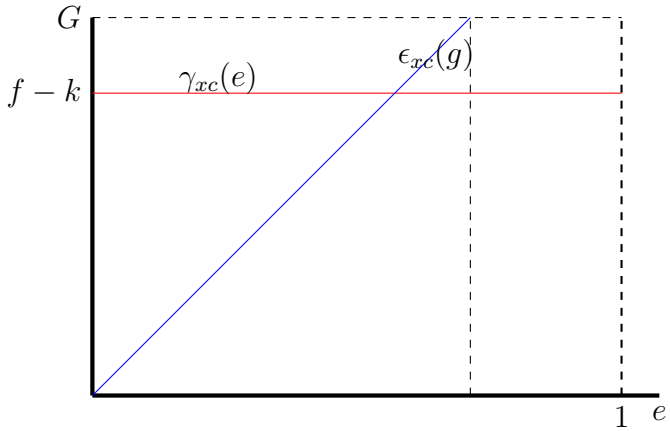

Figure 3: Competent Extortion Equilibrium

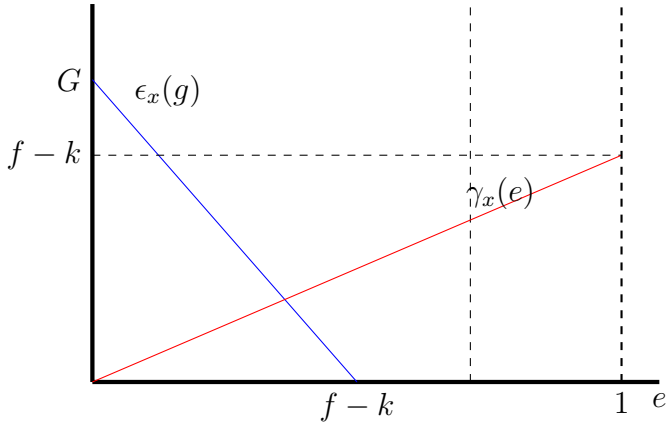

Figure 4: Full extortion equilibrium

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University Enclave, University of Delhi
(North Campus) Delhi 110007, India
Tel: 27667288/365/424
Email: system@iegindia.org