Online Appendix
Crime Entanglement, Deterrence, and Witness Credibility

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A Existence and Characterization Results without Symmetry

We introduce two axioms: *monotonicity* and *properness*. Together with the presumption of innocence axiom, these axioms ensure that all sequential equilibria are *symmetric*. First, let us recall the presumption of innocence axiom stated from the main text:

Axiom 1 (Presumption of Innocence). $q(0,0,...,0)=0$.

Next, we state our monotonicity axiom, which provides a specific meaning to agents' accusations.

Axiom 2 (Monotonicity). *For every* $\boldsymbol{a},\boldsymbol{a'}\in\{0,1\}^n$ *with* $\boldsymbol{a}\succ\boldsymbol{a'}$, *we have* $q(\boldsymbol{a})\geq q(\boldsymbol{a'})$.

In any equilibrium that satisfies Axioms 1 and 2, an agent's accusation weakly increases the probability that the principal is convicted. Therefore, for every $i\in\{1,2\}$, agent i's equilibrium strategy is characterized by two cutoffs: ω_i^* and ω_i^{**}, such that he accuses the principal when $\omega_i\leq\omega_i^*$ and $\theta_i=1$ or when $\omega_i\leq\omega_i^{**}$ and $\theta_i=0$. Therefore, a sequential equilibrium is characterized by a tuple $\big\{(\omega_i^*,\omega_i^{**},\rho_i)_{i=1}^n,\boldsymbol{\pi},q\big\}$ such that:

1. $\rho_i:\{0,1\}\rightarrow\Delta\big(\{0,1\}^{n-1}\big)$ is agent i's belief about θ_{-i} after observing θ_i;
2. $\boldsymbol{\pi}\in\Delta\big(\{0,1\}^n\big)$ is the principal's strategy;
3. $q:\{0,1\}^n\rightarrow[0,1]$ is the mapping from reporting profiles to conviction probabilities.

Our third axiom introduces a regularity condition on agents' beliefs at off-path information sets.

Axiom 3 (Properness). *For every* $i\in\{1,...,n\}$, $\widehat{\theta}_i\in\{0,1\}$, *and* $\theta'_{-i},\theta''_{-i}\in\{0,1\}^{n-1}$, *if the principal's expected payoff from* $(\widehat{\theta}_i,\theta'_{-i})$ *is strictly larger than his expected payoff from* $(\widehat{\theta}_i,\theta''_{-i})$, *then* $\rho_i(\widehat{\theta}_i)$ *attaches zero probability to* θ''_{-i}.

Axiom 3 requires that at every information set of every agent (no matter whether it is on or off path), the agent believes that the principal is arbitrarily less likely to make more costly mistakes. That is to say, within the subset of the principal's actions that are consistent with agent i's observation, his posterior belief only attaches strictly positive probability to actions that are optimal within this subset. This axiom has no bite when each agent has witnessed crime with positive probability. When there exists an agent whose probability of witnessing crime is 0, Axiom 3's requirement on off-path belief is similar to that in proper equilibrium (Myerson 1978). For our proofs to go through, one can replace Axiom 3 with the following Markovian axiom: for every $\boldsymbol{a}$ and $\boldsymbol{a'}$ such that the evaluator attaches the same probability with which the principal is guilty, we have $q(\boldsymbol{a}) = q(\boldsymbol{a'})$. For large enough punishments, the following result establishes the existence of a sequential equilibrium in the two-agent scenario that satisfies Axioms 1,2 and 3.

Proposition 2'. *There exists $\overline{L} > 0$ such that when $L > \overline{L}$, there exists a sequential equilibrium that satisfies Axioms 1, 2, and 3.*

The next result shows that, for large enough punishments, all sequential equilibria that respects Axioms 1,2, and 3 are symmetric:

Theorem 1'. *There exists $\overline{L} \in \mathbb{R}_+$ such that when $L > \overline{L}$, in every sequential equilibrium that satisfies Axioms 1, 2, and 3, there exists a triple $(\omega_m^*, \omega_m^{**}, \pi_m)$ such that:*

1. *For every $i \in \{1, 2\}$, agent i reports when $\{\omega_i \leq \omega_m^* \text{ and } \theta_i = 1\}$ or $\{\omega_i \leq \omega_m^{**} \text{ and } \theta_i = 0\}$.*
2. *The principal chooses $(\theta_1, \theta_2) = (0, 0)$ with probability $1-\pi_m$, $(\theta_1, \theta_2) = (1, 0)$ with probability $\pi_m/2$, and $(\theta_1, \theta_2) = (0, 1)$ with probability $\pi_m/2$.*

The proof of Theorem 1' as well as the remaining part of Theorem 1, can be found in Appendix C. According to Theorem 1', every equilibrium that survives our refinement must be symmetric, both in the agents' strategies and in the principal's strategy. This result has two implications. First, since the principal commits crime against each agent with interior probability, the agent's belief is pinned down via Bayes rule. Second, Theorem 1 in the main text and Theorem 1' together imply that all sequential equilibria that satisfy Axioms 1, 2 and 3 also possess the properties stated in Theorems 1 in the main text: the principal commits at most one crime, the probability of crime increases and the informativeness of report decreases compared to the single-agent benchmark. Moreover, as $L \to \infty$, the probability of crime converges to π^* and the informativeness of report converges to 1.

B Equilibrium Existence

B.1 Proof of Propositions 2 and 2'

We show that when L is large enough, there exists a symmetric equilibrium that satisfies Axioms 1, 2 and 3, and possesses the following three properties:

1. $q(\boldsymbol{a}) > 0$ if and only if $\boldsymbol{a} = (1, 1)$.
2. The principal either commits no crime or commits only one crime.
3. Each agent witnesses crime with strictly positive probability.[1]

Since an equilibrium that satisfies these three properties survives the refinements in Propositions 2 and 2', the existence of such an equilibrium implies the conclusions in Propositions 2 and 2'. We show the following proposition.

Proposition B.1. *There exists* $\overline{L} > 0$ *such that for every* $L > \overline{L}$*, there exists a tuple* $(\omega_m^*, \omega_m^{**}, q_m) \in \mathbb{R}_- \times \mathbb{R}_- \times (0, 1)$ *that solves the following three equations:*

$$\frac{q_m}{c}(\omega_m^* - c - b) = -\frac{1}{\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha} \tag{B.1}$$

$$\frac{q_m}{c}(\omega_m^{**} - c) = -\frac{l^*}{l^*+2} \cdot \frac{1}{\delta\Phi(\omega_m^*) + (1-\delta)\alpha} - \frac{2}{l^*+2} \cdot \frac{1}{\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha} \tag{B.2}$$

$$\frac{1}{\delta L} = q_m\Big(\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha\Big)\Big(\Phi(\omega_m^*) - \Phi(\omega_m^{**})\Big). \tag{B.3}$$

Proof of Proposition B.1: The proof consists of two steps. In **Step 1**, we show that the value of the following expression,

$$A \equiv \inf_{(\omega_m^*, \omega_m^{**}) \text{ that solves (B.1) and (B.2) when } q_m = 1} \delta\Big(\Phi(\omega_m^*) - \Phi(\omega_m^{**})\Big)\Big(\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha\Big) \tag{B.4}$$

which concerns $q_m = 1$, is bounded below away from 0. We establish this result by putting lower bounds on $\Phi(\omega_m^{**})$ and $\Phi(\omega_m^*) - \Phi(\omega_m^{**})$, respectively. To see this, first,

$$\omega_m^{**} \geq c - \frac{c}{(1-\delta)\alpha}$$

[1] All equilibria having this property trivially satisfies Axiom 3.

and therefore,

$$\Phi(\omega_m^{**}) \geq \Phi\Big(c - \frac{c}{(1-\delta)\alpha}\Big). \tag{B.5}$$

Next, we introduce the variable $\Delta \equiv \omega_m^* - \omega_m^{**}$, which must lie strictly between 0 and b. Deducting equation (B.2) from (B.1) and plugging in $q_m = 1$, we have:

$$\frac{b-\Delta}{c} = \frac{\delta l^*}{l^*+2}\Big(\delta\Phi(\omega_m^*) + (1-\delta)\alpha\Big)^{-1}\Big(\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha\Big)^{-1}\Big(\Phi(\omega_m^*) - \Phi(\omega_m^{**})\Big). \tag{B.6}$$

We consider two cases separately:

1. When $\Delta \geq b/2$, then

$$\delta\Big(\Phi(\omega_m^*) - \Phi(\omega_m^{**})\Big) \geq \frac{b\delta}{2}\phi(\omega_m^{**}) \geq \frac{b\delta}{2}\phi\Big(c - \frac{c}{(1-\delta)\alpha}\Big). \tag{B.7}$$

2. When $\Delta < b/2$, then (B.6) implies that:

$$\begin{aligned}\delta\Big(\Phi(\omega_m^*) - \Phi(\omega_m^{**})\Big) &\geq \frac{b(l^*+2)}{2l^*c}\Big(\delta\Phi(\omega_m^*) + (1-\delta)\alpha\Big)\Big(\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha\Big). \\ &\geq \frac{b(l^*+2)}{2l^*c}\Big(\delta\Phi\big(c - \frac{c}{(1-\delta)\alpha}\big) + (1-\delta)\alpha\Big)^2. \end{aligned} \tag{B.8}$$

Taking the minimum of the right-hand sides of (B.7) and (B.8), we obtain a lower bound for $\delta\Big(\Phi(\omega_m^*) - \Phi(\omega_m^{**})\Big)$. This together with (B.5) implies a strictly positive lower bound for (B.4).

Let $\underline{A}$ denote the lower bound obtained in Step 1. In **Step 2**, we show that when $L > \underline{A}^{-1}$, there exists a solution to (B.1), (B.2) and (B.3). For every $(\Phi^*, \Phi^{**}, q) \in [0,1]^2 \times [1/L, 1]$, let $f \equiv (f_1, f_2, f_3) : [0,1]^2 \times [1/L, 1] \to [0,1]^2 \times [1/L, 1]$ be the following mapping:

$$f_1(\Phi^*, \Phi^{**}, q) = \Phi\Big(b + c - \frac{c}{q(\delta\Phi^{**} + (1-\delta)\alpha)}\Big), \tag{B.9}$$

$$f_2(\Phi^*, \Phi^{**}, q) = \Phi\Big(c - \frac{cl^*}{q(l^*+2)}\frac{1}{\delta\Phi^* + (1-\delta)\alpha} - \frac{2c}{q(l^*+2)}\frac{1}{\delta\Phi^{**} + (1-\delta)\alpha}\Big), \tag{B.10}$$

$$f_3(\Phi^*, \Phi^{**}, q) = \min\Big\{1, \frac{1}{\delta L}\frac{1}{\Big(\delta\Phi^{**} + (1-\delta)\alpha\Big)\Big(\Phi^* - \Phi^{**}\Big)}\Big\}. \tag{B.11}$$

Since f is continuous, Brouwer's fixed point theorem implies the existence of a fixed point.

Next, we show that if (Φ^*, Φ^{**}, q) is a fixed point, then $q < 1$. This implies that every solution to the fixed point problem solves the system of equations (B.1), (B.2) and (B.3) as (B.11) and (B.3) are the same when $q < 1$. Suppose toward a contradiction that $q = 1$, then $\Phi^{-1}(\Phi^*)$ and $\Phi^{-1}(\Phi^{**})$ is a solution to (B.1) and (B.2) once we fix q to be 1. According to Part I of the proof, the assumption that $L > \underline{A}^{-1}$ implies that

$$\frac{1}{\delta L}\frac{1}{\Big(\delta\Phi^{**} + (1-\delta)\alpha\Big)\Big(\Phi^* - \Phi^{**}\Big)} < 1.$$

Therefore the RHS of (B.11) is strictly less than 1. This contradicts the claim that $(\Phi^*, \Phi^{**}, 1)$ is a fixed point of f, which implies that the value of q at the fixed point is strictly less than 1. □

Given the tuple $(\omega_m^*, \omega_m^{**}, q_m) \in \mathbb{R}_- \times \mathbb{R}_- \times (0,1)$, one can then uniquely pin down $\pi_m \in (0,1)$ via

$$\frac{\delta\Phi(\omega_m^*) + (1-\delta)\alpha}{\delta\Phi(\omega_m^{**}) + (1-\delta)\alpha} = l^* \Big/ \frac{\pi_m}{1-\pi_m}. \tag{B.12}$$

According to the analysis of subsection 3.4 in the main text, (B.1), (B.2), (B.3) and (B.12) are sufficient conditions for the existence of an equilibrium $\{\omega_m^*, \omega_m^{**}, q_m, \pi_m\}$ that satisfies Axioms 1 and 2, and for which the conviction probabilities satisfy $q(1,1) = q_m \in (0,1)$ and $q(0,0) = q(1,0) = q(0,1) = 0$.

B.2 Generalizations

We generalize our existence result to three or more agents and to alternative specifications of the mechanical types' reporting strategies. Suppose that when agent i is mechanical, he reports with probability p_1 when $\theta_i = 1$ and with probability p_0 when $\theta_i = 0$. We assume that $1 > p_1 \geq p_0 > 0$.[2] We show that for every $\{c, \delta, p_0, p_1\}$, there exists $\overline{L} > 0$ such that for every $L > \overline{L}$, there exists a symmetric equilibrium satisfying:

1. $q(\boldsymbol{a}) > 0$ if and only if $\boldsymbol{a} = (1, 1, ..., 1)$.
2. The principal either commits one crime or commits no crime.

As with the existence proof of the two-agent case, in which mechanical types' reporting probability does not depend on θ_i, the key step is to establish the following proposition:

Proposition B.2. *There exists $\overline{L} > 0$ such that for every $L > \overline{L}$, there exists a triple $(\omega^*, \omega^{**}, q) \in \mathbb{R}_- \times \mathbb{R}_- \times (0,1)$ that solves the following three equations:*

$$\frac{q}{c}(\omega^* - c - b) = -\frac{1}{(\Psi^{**})^{n-1}} \tag{B.13}$$

[2] In principle, we can also allow the mechanical types of different agents to adopt different reporting probabilities. For notation simplicity, we focus on environments in which agents are symmetric.

$$\frac{q}{c}(\omega^{**}-c) = -\frac{n}{n+(n-1)l^*}\frac{1}{(\Psi^{**})^{n-1}} - \frac{(n-1)l^*}{n+(n-1)l^*}\frac{1}{(\Psi^{**})^{n-2}\Psi^*} \tag{B.14}$$

$$\frac{1}{\delta L} = q(\Psi^{**})^{n-1}(\Psi^* - \Psi^{**}) \tag{B.15}$$

where

$$\Psi^* \equiv \delta\Phi(\omega^*) + (1-\delta)p_1 \text{ and } \Psi^{**} \equiv \delta\Phi(\omega^{**}) + (1-\delta)p_0.$$

The proof of Proposition B.2 is very similar to that of Proposition B.1 and omitted to avoid repetition. Notice that (B.12), (B.13), (B.14), and (B.15) are sufficient conditions for the existence of an equilibrium that satisfies Axioms 1, 2 and 3, for which the probability of crime π can be computed via (B.12) after fixing $\{\omega^*, \omega^{**}, q\}$.

C Proof of Theorems 1 and 1'

This appendix consists of two parts. In section C.1, we show that all equilibria that (1) respect Axioms 1-3, and (2) satisfies $q(0,0) = q(1,0) = q(0,1) = 0$, must be symmetric. In section C.2, we show that $q(0,0) = q(1,0) = q(0,1) = 0$ is satisfied in every equilibrium when L is large enough.

C.1 Symmetry

We establish the symmetry properties of all equilibria that satisfy Axioms 1, 2 and 3. when the conviction probabilities are such that $q(0,0) = q(1,0) = q(0,1) = 0$, and then show in Proposition C.2 that this condition on the conviction probabilities is satisfied in all sequential equilibria that satisfy Axioms 1, 2 and 3.

Proposition C.1. *In every equilibrium that satisfies Axioms 1, 2 and 3, with* $q(0,0) = q(1,0) = q(0,1) = 0$*, the principal chooses* $(\theta_1, \theta_2) = (0,1)$ *and* $(\theta_1, \theta_2) = (1,0)$ *with the same probability and the two agents adopt the same reporting cutoffs.*

The proof consists of two parts. In section C.1.1, we consider equilibria in which both $(\theta_1, \theta_2) = (1,0)$ and $(\theta_1, \theta_2) = (0,1)$ occur with strictly positive probability. In section C.1.2, we consider equilibria in which either $(\theta_1, \theta_2) = (1,0)$ or $(\theta_1, \theta_2) = (0,1)$ never happens. The properness axiom, namely, Axiom 3 is only used in the second part, to rule out unreasonable equilibria in which the principal commits a crime against agent $i \in \{1,2\}$ with 0 probability, but the judge only convicts the principal when agent i accuses the principal.

C.1.1 Part I: Both Agents Witnessed Crime with Positive Probability

For $i \in \{1, 2\}$, recall that β_i be the probability that $\theta_i = 0$ conditional on $\theta_j = 0$. We have the following expressions on the reporting cutoffs:

$$\omega_i^* = b - c\frac{1 - qQ_{1,j}}{qQ_{1,j}} \tag{C.1}$$

and

$$\omega_i^{**} = -c\frac{1 - qQ_{0,j}}{qQ_{0,j}}, \tag{C.2}$$

with

$$Q_{1,j} \equiv \delta\Phi(\omega_j^{**}) + (1-\delta)\alpha$$

and

$$Q_{0,j} \equiv \delta\Big[\beta_j\Phi(\omega_j^{**}) + (1-\beta_j)\Phi(\omega_j^*)\Big] + (1-\delta)\alpha.$$

Without loss of generality, suppose toward a contradiction that the probability that $\theta_i = 1$ and $\theta_j = 0$ is weakly higher than the probability that $\theta_j = 1$ and $\theta_i = 0$. Recall that β_i is defined as the probability that $\theta_i = 0$ conditional on $\theta_j = 0$, we know that $\beta_i \le \beta_j$. Moreover, since the equilibrium probability of crime is interior (Lemma 3.1), the principal's incentive constraints imply that the cost of setting $\theta_i = 1$ conditional on $\theta_j = 0$ is no higher than the cost of setting $\theta_j = 1$ conditional on $\theta_i = 0$. That is,

$$\frac{\delta q\Phi(\omega_j^{**})\Big(\Phi(\omega_i^*) - \Phi(\omega_i^{**})\Big)}{\delta q\Phi(\omega_i^{**})\Big(\Phi(\omega_j^*) - \Phi(\omega_j^{**})\Big)} \le 1,$$

which is equivalent to:

$$\frac{\Phi(\omega_i^*)\Phi(\omega_j^{**})}{\Phi(\omega_j^*)\Phi(\omega_i^{**})} \le 1. \tag{C.3}$$

First, we show that $\omega_1^* = \omega_2^*$ and $\omega_1^{**} = \omega_2^{**}$ when the probability of $\theta_1 = 1$ and the probability of $\theta_2 = 1$ are equal, i.e., $\beta_1 = \beta_2$. In this case, both probabilities are interior, which implies that (C.3) holds with equality. Suppose toward a contradiction that $\omega_1^* < \omega_2^*$, then (C.1) implies that $\omega_1^{**} > \omega_2^{**}$. This implies that $\Phi(\omega_1^*)\Phi(\omega_2^{**}) < \Phi(\omega_2^*)\Phi(\omega_1^{**})$, which contradicts equality (C.3).

Next, we show that $\beta_1 = \beta_2$ in every equilibrium. Suppose toward a contradiction that $\beta_1 < \beta_2$, i.e., $\theta_1 = 1$ occurs with strictly higher probability. Consider the following three cases:

1. If $\omega_1^* > \omega_2^*$, (C.1) implies that $\omega_1^{**} < \omega_2^{**}$. This contradicts the requirement in (C.3) that $\Phi(\omega_1^*)\Phi(\omega_2^{**}) \le \Phi(\omega_2^*)\Phi(\omega_1^{**})$.

2. If $\omega_1^* = \omega_2^*$, (C.1) implies that $\omega_1^{**} = \omega_2^{**}$. On the other hand, (C.2) and $\beta_1 < \beta_2$ imply that

$\omega_1^{**} \neq \omega_2^{**}$. This leads to a contradiction.

3. If $\omega_1^* < \omega_2^*$, then $\omega_1^{**} > \omega_2^{**}$. This implies that $\Phi(\omega_1^*)\Phi(\omega_2^{**}) < \Phi(\omega_2^*)\Phi(\omega_1^{**})$. Therefore, the principal faces strictly lower cost to set $\theta_1 = 1$. Therefore in equilibrium, he sets $\theta_1 = 1$ with positive probability and sets $\theta_2 = 1$ with zero probability. We consider such equilibria in the next subsection.

C.1.2 Part II: One Agent Witness Crime with Zero Probability

Suppose toward a contradiction that the principal surely abstains from committing crime against agent 2. Then, the principal's incentive constraint implies that committing crime against agent 2 is weakly more costly than committing crime against agent 1, or equivalently:

$$\mathcal{I}_2 \equiv \frac{\Psi_2^*}{\Psi_2^{**}} \geq \mathcal{I}_1 \equiv \frac{\Psi_1^*}{\Psi_1^{**}}. \tag{C.4}$$

Agent 1 witnesses crime with strictly positive probability and his reporting cutoffs are:

$$\omega_1^* = b + c - \frac{c}{q\Psi_2^{**}} \text{ and } \omega_1^{**} = c - \frac{c}{q\Psi_2^{**}}.$$

Agent 2 witnesses crime with zero probability, his reporting cutoff when he has not witnessed a crime is:

$$\omega_2^{**} = c - \frac{c}{q(\pi\Psi_1^* + (1-\pi)\Psi_1^{**})}, \tag{C.5}$$

in which π is the probability with which the principal commits a crime against agent 1.

First, we show that $\omega_1^{**} < \omega_2^{**}$. Suppose toward a contradiction that $\omega_1^{**} \geq \omega_2^{**}$, then the comparison between the expressions for ω_1^{**} and ω_2^{**} imply that:

$$\Psi_2^{**} \geq \pi\Psi_1^* + (1-\pi)\Psi_1^{**} > \Psi_1^{**},$$

which yields the desired contradiction and implies that $\omega_1^{**} < \omega_2^{**}$.

Next, we show that $|\omega_2^* - \omega_2^{**}| < b$. Notice that the principal's marginal cost of setting $\theta_1 = 1$ equals 1 when $\theta_2 = 0$. Since $q(0,0) + q(1,1) > q(1,0) + q(0,1)$, the principal's marginal cost of setting $\theta_1 = 1$ when $\theta_2 = 1$ must be strictly greater than 1. When agent 2 observes a crime, namely $\theta_2 = 1$, the properness axiom (Axiom 3) requires that agent 2 attaches probability 1 to $\theta_1 = 0$. Therefore,

$$\omega_2^* = b + c - \frac{c}{q\Psi_1^{**}} < \omega_2^{**} + b = b + c - \frac{c}{q(\pi\Psi_1^* + (1-\pi)\Psi_1^{**})}.$$

Summarizing the previous two steps, we have:

$$\mathcal{I}_1 = \frac{\Psi(\omega_1^*)}{\Psi(\omega_1^{**})} > \frac{\Psi(\omega_2^{**} + b)}{\Psi(\omega_2^{**})} > \frac{\Psi(\omega_2^*)}{\Psi(\omega_2^{**})} = \mathcal{I}_2, \tag{C.6}$$

which contradicts inequality (C.4). The above contradiction rules out equilibria in which one of the agents witness crime with zero probability.

C.2 Equilibrium Conviction Probabilities

The following proposition implies statement 3 of Theorem 1 in the main text.

Proposition C.2. *There exists $\overline{L} > 0$ such that when $L > \overline{L}$, we have $q(0,0) = q(1,0) = q(0,1) = 0$*

1. *for every symmetric Bayesian Nash equilibrium that satisfies Axiom 1,*
2. *and for every sequential equilibrium that satisfies Axioms 1, 2, and 3.*

The proof focuses on sequential equilibria that satisfy Axioms 1,2 and 3, which we hereafter call *equilibria* for simplicity. Our arguments, which make no use of symmetry, apply to all symmetric Bayesian Nash equilibria that satisfy Axiom 1.

The key step is to rule out equilibria in which the conviction probabilities do not satisfy the above property when L is large enough. In particular, we show that if the conviction probabilities are such that either $q(0,1)$ or $q(1,0)$ is strictly positive, then there exists a *uniform lower bound* on the increased probability of conviction, that applies to all equilibria that satisfy Axioms 1, 2 and 3, and holds uniformly across all values of L. When L is large enough, the principal’s cost of committing crime against each agent will be strictly above 1, which contradicts Lemma 3.1 that the principal is guilty with strictly positive probability in every equilibrium.

For notational simplicity, let $\Phi_i^* \equiv \Phi(\omega_i^*)$,

$$\Psi_i^* \equiv \delta\Phi_i^* + (1-\delta)\alpha, \text{ and } \Psi_i^{**} \equiv \delta\Phi_i^{**} + (1-\delta)\alpha \text{ for } i \in \{1,2\}.$$

For future reference, we recall a result that establishes the complementarity and substitutability between the principal’s choices of θ_1 and θ_2, whose proof is in Appendix A.4 of the main text:

Lemma C.1. *The principal's choices of θ_1 and θ_2 are strategic substitutes if*

$$q(1,1) + q(0,0) - q(1,0) - q(0,1) \tag{C.7}$$

is strictly positive, and are strategic complements if the value of (C.7) is strictly negative.

The rest of this section is organized as follows. In subsection C.2.1, we examine equilibria in which θ_1 and θ_2 are strategic substitutes from the principal's perspective. In subsection C.2.2, we examine equilibria in which θ_1 and θ_2 are strategic complements. In subsection C.2.3, we examine equilibria in the knife-edge case where the value of (C.7) is 0. The proof of a technical lemma is in subsection C.2.4.

C.2.1 The value of (C.7) is strictly positive

In this subsection, we focus on equilibria in which the principal's decisions are strategic substitutes, namely $q(1,0) + q(0,1) < q(0,0) + q(1,1)$.

First, we claim that if $\max\{q(0,1), q(1,0)\} > 0$, then $q(1,1) = 1$. Suppose toward a contradiction that both $q(1,0)$ and $q(1,1)$ are strictly between 0 and 1. Then, agent 2's report does not affect the posterior belief about $\overline{\theta}$. This can only be the case either when a_2 is uninformative about θ_2, or agent 2 has witnessed crime with zero probability. The first case implies that $\omega_2^* = \omega_2^{**}$ and hence $\Phi(\omega_2^*) = \Phi(\omega_2^{**})$. This implies that the principal's cost of committing crime against agent 2 is 0, which leads to a contradiction. The second case can be ruled out using a similar argument, which relies on the properness axiom (Axiom 3).

Given that $q(1,1) = 1$ and $q(0,0) = 0$, we have the following expressions for agent 1's reporting cutoffs when he has and has not witnessed crime:

$$\omega_1^* \equiv b - c\frac{(1-\Psi_2^{**})(1-q(1,0))}{q(1,0) + \Psi_2^{**}(1-q(1,0)-q(0,1))}, \tag{C.8}$$

$$\omega_1^{**} \equiv -c\frac{(1-X_2)(1-q(1,0))}{q(1,0) + X_2(1-q(1,0)-q(0,1))}, \tag{C.9}$$

in which

$$X_2 \equiv \frac{1-p_1-p_2}{1-p_1}\Psi_2^{**} + \frac{p_2}{1-p_1}\Psi_2^* \tag{C.10}$$

and p_i is the probability with which $\theta_i = 1$. One observation is that ω_1^* is increasing in Ψ_2^{**} and $q(1,0)$, and is decreasing in $q(0,1)$; ω_1^{**} is increasing in X_2 and $q(1,0)$, and is decreasing in $q(0,1)$. The distance between the two cutoffs is given by:

$$\omega_1^* - \omega_1^{**} = b - (\Psi_2^* - \Psi_2^{**})C_1 \tag{C.11}$$

where

$$C_1 \equiv c(1-q(0,1))(1-q(1,0)) \times \frac{p_2}{1-p_1}$$
$$\times \frac{1}{q(1,0)+X_2(1-q(1,0)-q(0,1))} \times \frac{1}{q(1,0)+\Psi_2^{**}(1-q(1,0)-q(0,1))}. \tag{C.12}$$

Symmetrically, one can obtain the expressions for ω_2^* and ω_2^{**} as well as the distance between them. Conditional on setting $\theta_2 = 0$, the probability with which the principal is convicted increases by:

$$(\Psi_1^* - \Psi_1^{**})\Big(q(1,0)+\Psi_2^{**}(1-q(1,0)-q(0,1))\Big) \tag{C.13}$$

once he sets $\theta_1 = 1$. Similarly, if the principal sets $\theta_2 = 1$ given that $\theta_1 = 0$, this probability is increased by:

$$(\Psi_2^* - \Psi_2^{**})\Big(q(0,1)+\Psi_1^{**}(1-q(1,0)-q(0,1))\Big). \tag{C.14}$$

In every equilibrium, both (C.13) and (C.14) are bounded below $1/L$. In what follows, we establish a lower bound for the maximum of these two expressions, which does not depend on L. This is sufficient to rule out equilibria of this form when L is large enough. Throughout the proof, we assume that $\omega_1^* \geq \omega_2^*$, which is without loss of generality. This leads to the following lemma on the comparison between $q(1,0)$ and $q(0,1)$.

Lemma C.2. *In every equilibrium where $\omega_1^* \geq \omega_2^*$, we have $q(1,0) \geq q(0,1)$.*

We use Lemma C.2 in the proceeding arguments, and will defer its proof to the end of this appendix.

Lower Bound on ω_1^*: For every $\epsilon > 0$,

1. If $q(1,0) \geq \epsilon$, then
$$\omega_1^{**} \geq -c\frac{1-\epsilon}{\epsilon}. \tag{C.15}$$

2. If $q(1,0) < \epsilon$, then $q(0,1) \in (0,\epsilon)$ according to Lemma C.2. Therefore, we have:

$$\begin{aligned}
\omega_2^* &= b - c\frac{(1-\Psi_1^{**})(1-q(0,1))}{q(0,1)+\Psi_1^{**}(1-q(1,0)-q(0,1))} \\
&\geq b - c\frac{\Big(1-\delta\Phi(\omega_1^*-b)-(1-\delta)\alpha\Big)(1-q(0,1))}{q(0,1)+\Big(\delta\Phi(\omega_1^*-b)+(1-\delta)\alpha\Big)\Big(1-q(1,0)-q(0,1)\Big)} \\
&\geq b - c\frac{\Big(1-\delta\Phi(\omega_2^*-b)-(1-\delta)\alpha\Big)(1-q(0,1))}{q(0,1)+\Big(\delta\Phi(\omega_2^*-b)+(1-\delta)\alpha\Big)\Big(1-q(1,0)-q(0,1)\Big)} \\
&\geq b - c\frac{1-\delta\Phi(\omega_2^*-b)-(1-\delta)\alpha}{(1-\epsilon)\Big(\delta\Phi(\omega_2^*-b)+(1-\delta)\alpha\Big)}. \qquad \text{(C.16)}
\end{aligned}$$

As was shown in Online Appendix A that there exists a solution to the following equation:

$$\omega_2^* = b - c\frac{1-\delta\Phi(\omega_2^*-b)-(1-\delta)\alpha}{(1-\epsilon)\Big(\delta\Phi(\omega_2^*-b)+(1-\delta)\alpha\Big)}.$$

Denote it by $\underline{\omega}^*(\epsilon)$ such that (C.16) is satisfied only when $\omega_2^* \geq \underline{\omega}^*(\epsilon)$. Since $\underline{\omega}^*(\epsilon)$ is decreasing in ϵ, a lower bound for ω_1^* is given by:

$$\underline{\omega}_1^* \equiv \sup_{\epsilon\in[0,1]} \Big\{ \min\big\{b - c\frac{1-\epsilon}{\epsilon}, \underline{\omega}^*(\epsilon)\big\}\Big\}, \qquad \text{(C.17)}$$

which is finite and moreover, does not depend on L.

Upper Bound on C_1: The key to bound C_1 is to bound the term

$$\frac{1}{q(1,0)+\Psi_2^{**}(1-q(1,0)-q(0,1))} \qquad \text{(C.18)}$$

from above. For every $\epsilon > 0$, consider the following two cases:

1. If $q(1,0) \geq \epsilon$, then (C.18) is no more than $1/\epsilon$.

2. If $q(1,0) < \epsilon$, then $q(0,1) < \epsilon$ according to Lemma C.2. Let $\underline{\omega}_2^{**}(\epsilon)$ be the smallest root of the following equation:

$$\omega \equiv -c\frac{1-\delta\Phi(\omega)-(1-\delta)\alpha}{\Big(\delta\Phi(\omega)+(1-\delta)\alpha\Big)(1-\epsilon)}, \qquad \text{(C.19)}$$

which is a lower bound for ω_2^{**} given that $q(1,0), q(0,1) \in [0,\epsilon]$. An upper bound on (C.18) is given by:

$$\frac{1}{q(1,0)+\Psi_2^{**}(1-q(1,0)-q(0,1))} \leq \frac{1}{\Phi(\underline{\omega}_2^{**}(\epsilon))(1-2\epsilon)}. \tag{C.20}$$

In summary we have:

$$C_1 \leq cY^2 \tag{C.21}$$

where

$$Y \equiv \inf_{\epsilon\in[0,1]} \Big\{ \max\big\{1/\epsilon, \frac{1}{\Phi(\underline{\omega}_2^{**})(1-2\epsilon)}\big\}\Big\}.$$

Lower Bound on the Maximum of (C.13) and (C.14): In this last step, we establish a lower bound on the maximum of (C.13) and (C.14). A useful inequality is that for every ω', ω'' with $\omega' > \omega''$,

$$\Phi(\omega') - \Phi(\omega'') \geq (\omega' - \omega'') \min_{\omega\in[\omega',\omega'']} \phi(\omega). \tag{C.22}$$

We consider two cases. First, consider the case in which $\Phi(\omega_1^*) - \Phi(\omega_1^{**}) \geq \Phi(\omega_2^*) - \Phi(\omega_2^{**})$. Using the fact that $\Psi_i^* - \Psi_i^{**} = \delta(\Phi(\omega_i^*) - \Phi(\omega_i^{**}))$, we have:

$$\frac{\delta}{\min_{\omega\in[\omega_1^{**},\omega_1^*]}\phi(\omega)}\Big(\Phi(\omega_1^*) - \Phi(\omega_1^{**})\Big) \geq \omega_1^* - \omega_1^{**} = b - C_1(\Psi_2^* - \Psi_2^{**}) \geq b - C_1(\Psi_1^* - \Psi_1^{**}). \tag{C.23}$$

This together with (C.21) gives an lower bound on $\Psi_1^* - \Psi_1^{**}$. Moreover,

$$\begin{aligned} q(1,0)+\Psi_2^{**}(1-q(1,0)) \quad &\geq \quad q(1,0)+\Psi_2^{**}\big(1-q(1,0)-q(0,1)\big) \\ &\geq \quad \frac{c\big(1-q(1,0)\big)(1-\Psi_2^{**})}{|\underline{\omega}_1^*|}, \end{aligned} \tag{C.24}$$

where the last inequality uses (C.8) as well as the previous conclusion that $\underline{\omega}_1^*$ is a lower bound of ω_1^*. This gives a lower bound on $q(1,0)$. The two parts together imply a lower bound on (C.13).

Second, consider the case in which $\Phi(\omega_1^*) - \Phi(\omega_1^{**}) < \Phi(\omega_2^*) - \Phi(\omega_2^{**})$. Let

$$\beta \equiv \frac{\omega_1^* - \omega_1^{**}}{b}. \tag{C.25}$$

Since $X_2 > \Psi_2^{**}$, we have $\beta \in (0,1)$. First, recall that $\underline{\omega}_1^*$ is the lower bound on ω_1, we have:

$$\frac{1}{\delta}(\Psi_1^* - \Psi_1^{**}) = \Phi(\omega_1^*) - \Phi(\omega_1^{**}) \geq \beta b \phi(\underline{\omega}_1^* - b). \tag{C.26}$$

On the other hand, (C.11) and (C.21) imply that:

$$\Psi_2^* - \Psi_2^{**} = (1-\beta)b/C_1 \geq \frac{(1-\beta)bY^2}{c} \tag{C.27}$$

Since the pdf of normal distribution increases in ω when $\omega < 0$, (C.27) leads to a lower bound on ω_2^{**}. We denote this lower bound by $\widetilde{\omega}(\beta)$. By definition, $\widetilde{\omega}(\beta)$ decreases with β.

1. When $\beta \geq 1/2$, (C.26) implies a lower bound for $\Phi(\omega_1^*) - \Phi(\omega_1^{**})$. Applying (C.24), one can obtain a lower bound for $q(1,0)$. The two together lead to a lower bound on (C.13).[3]

2. When $\beta < 1/2$, we have $\omega_2^{**} \geq \widetilde{\omega}(1/2)$ and furthermore,

$$\Psi_2^* - \Psi_2^{**} \geq \frac{b}{2C_1}.$$

The lower bound on ω_2^{**} also leads to a lower bound on $q(0,1) + \Psi_1^{**}(1 - q(1,0) - q(0,1))$, as (C.9) implies that:

$$\widetilde{\omega}(1/2) \leq \omega_2^{**} \leq \omega_2^* = -c\frac{(1-\Psi_1^{**})(1-q(0,1))}{q(0,1) + \Psi_1^{**}(1-q(1,0)-q(0,1))},$$

which leads to:

$$q(0,1) + \Psi_1^{**}(1-q(1,0)-q(0,1)) \geq \frac{(1-\Psi_1^{**})(1-q(0,1))}{-\widetilde{\omega}(1/2)/c}. \tag{C.28}$$

Since $1-\Psi_1^{**} \geq \delta - \delta\Phi(0)$ and $1-q(0,1) \geq 1/2$, the lower bound on $q(0,1)+\Psi_1^{**}(1-q(1,0)-q(0,1))$ is strictly bounded away from 0. This leads to a uniform lower bound on (C.14).

C.2.2 The value of (C.7) is strictly negative

Next, we study the case where $q(1,0) + q(0,1) > q(0,0) + q(1,1)$, or in another word, the choices of θ_1 and θ_2 are strategic complements from the principal's perspective. Lemma C.1 implies that conditional on having committed a crime against one agent, the principal has a strict incentive to commit a crime against the other agent. Therefore in such equilibria, either he commits crime against both agents or he commits no crime.

We start from two observations. First, we show that $q(1,1) = 1$ in all such equilibria. This is because if $q(1,1) \in (0,1)$ and $q(1,0) + q(0,1) > q(0,0) + q(1,1)$, then either $q(0,1) > 0$ or $q(1,0) > 0$ or both. If $q(0,1) > 0$, then the judge's posterior belief about $\overline{\theta}$ does not change no matter whether agent 1 reports or not, this gives the principal a strict incentive to commit crime against agent 1, which leads to

[3] The validity of inequality (C.24) does not depend on the sign of $\Psi_1^* - \Psi_1^{**} - \Psi_2^* + \Psi_2^{**}$.

a contradiction. Using a similar argument, one can rule out the case in which $q(1,0) > 0$.

Second, due to the strategic complementarity between θ_1 and θ_2, agent i's belief about agent j's probability of submitting a report is strictly higher when $\theta_i = 0$ compared to $\theta_i = 1$. This implies that:

$$\min\{\omega_1^* - \omega_1^{**}, \omega_2^* - \omega_2^{**}\} \geq b. \tag{C.29}$$

By setting $\theta_1 = \theta_2 = 1$, the principal's probability of being convicted is increased by at least

$$(\Psi_1^* - \Psi_1^{**})\Big(\Psi_2^*(1 - q(0,1)) + (1 - \Psi_2^*)q(1,0)\Big) + (\Psi_2^* - \Psi_2^{**})\Big(\Psi_1^{**}(1 - q(1,0)) + (1 - \Psi_1^{**})q(0,1)\Big), \tag{C.30}$$

compared to the case in which he sets $\theta_1 = \theta_2 = 0$. Therefore, the value of (C.30) cannot exceed $2/L$. The rest of this proof establishes a lower bound on (C.30) that applies uniformly across all L. This in turn implies that when L is large enough, equilibria that exhibit strategic complementarities between θ_1 and θ_2 do not exist.

First, $\max\{q(0,1), q(1,0)\} \geq 1/2$ since $q(0,1) + q(1,0) \geq 1$. Without loss of generality, we assume that $q(1,0) \geq 1/2$. Second, agent i has a dominant strategy of not reporting when $\omega_i > 0$, so $1 - \Psi_i^* \geq \delta(1 - \Phi(0))$. Third, player 1's reporting threshold when $\theta_1 = 1$ is:

$$\omega_1^* = b - c\frac{(1 - Q_2^H)(1 - q(1,0))}{Q_2^H(1 - q(0,1)) + (1 - Q_2^H)q(1,0)} \tag{C.31}$$

where Q_2^H is the probability with which player 2 submits a report conditional on $\theta_1 = 1$. One can verify that the RHS of (C.31) is strictly increasing in Q_2^H. Therefore,

$$\omega_1^* \geq b - c\frac{1 - q(1,0)}{q(1,0)} \geq b - c.$$

From (C.29), we have

$$\frac{1}{\delta}(\Psi_1^* - \Psi_1^{**}) = \Phi(\omega_1^*) - \Phi(\omega_1^{**}) \geq b \min_{\omega \in [-b-c, 0]} \phi(\omega). \tag{C.32}$$

The uniform lower bound on (C.30) is then given by

$$\underbrace{(\Psi_1^* - \Psi_1^{**})}_{\text{bounded by (C.32)}} \Big(\underbrace{\Psi_2^*(1 - q(0,1))}_{\geq 0} + \underbrace{(1 - \Psi_2^*)}_{\geq \delta(1-\Phi(0))} \underbrace{q(1,0)}_{\geq 1/2}\Big) + \underbrace{(\Psi_2^* - \Psi_2^{**})\Big(\Psi_1^{**}(1 - q(1,0)) + (1 - \Psi_1^{**})q(0,1)\Big)}_{\geq 0}$$

$$\geq \frac{\delta^2 b}{2}(1-\Phi(0)) \min_{\omega \in [-b-c,0]} \phi(\omega), \tag{C.33}$$

which concludes the proof for this case.

C.2.3 The value of (C.7) is 0

Part I: We show that in every equilibrium where the value of (C.7) is 0, each agent witnesses crime with strictly positive probability and moreover, $q(1,1)=1$. The implications of these conclusions are:

1. $q(1,0)+q(0,1)=1$.
2. The marginal cost of committing crime against each agent is the same, namely:

$$(\Psi_1^* - \Psi_1^{**})q(1,0) = (\Psi_2^* - \Psi_2^{**})q(0,1). \tag{C.34}$$

First, suppose toward a contradiction that the principal commits crime against agent 1 with probability 0. Then whether agent 1 accuses the principal or not does not affect the evaluator's posterior belief about $\theta_1\theta_2 = 0$. Therefore, $q(1,0)=q(0,0)=0$. Since the value of (C.7) is 0, we have $q(0,1)=q(1,1)\in(0,1]$. This contradicts the conclusion of Lemma 3.1 since q is not responsive to agent 1's report, which leads to a contradiction.

Next, suppose toward a contradiction that $q(1,1)\in(0,1)$ and each agent witnesses crime with positive probability in equilibrium, then either $q(1,0)\in(0,1)$ or $q(0,1)\in(0,1)$ or both. The previous paragraph has ruled out equilibria in which either $q(1,0)$ or $q(0,1)$ is 0. Suppose $q(1,0), q(0,1), q(1,1)\in(0,1)$, then reporting profiles $(1,1)$, $(1,0)$ and $(0,1)$ lead to the same posterior belief about whether the principal is guilty or innocent. For $i\in\{1,2\}$, let p_i be the probability with which the principal only commits crime against agent i conditional on him being guilty. The posterior belief under $(1,1)$ coincides with the posterior belief under $(1,0)$, which implies that:

$$(1-p_1-p_2)\frac{\Psi_1^*\Psi_2^*}{\Psi_1^{**}\Psi_2^{**}} + p_1\frac{\Psi_1^*}{\Psi_1^{**}} + p_2\frac{\Psi_2^*}{\Psi_2^{**}} = (1-p_1-p_2)\frac{\Psi_1^*(1-\Psi_2^*)}{\Psi_1^{**}(1-\Psi_2^{**})} + p_1\frac{\Psi_1^*}{\Psi_1^{**}} + p_2\frac{1-\Psi_2^*}{1-\Psi_2^{**}} \tag{C.35}$$

Since

$$\frac{\Psi_1^*\Psi_2^*}{\Psi_1^{**}\Psi_2^{**}} > \frac{\Psi_1^*(1-\Psi_2^*)}{\Psi_1^{**}(1-\Psi_2^{**})}$$

and

$$\frac{\Psi_2^*}{\Psi_2^{**}} > \frac{1-\Psi_2^*}{1-\Psi_2^{**}},$$

the LHS of (C.35) is strictly greater than the RHS of (C.35) unless $p_1 = 1$. By assumption, the principal commits crime against each agent with strictly positive probability, so either $1 - p_1 - p_2 > 0$ or $p_2 > 0$, which implies that (C.35) cannot be true.

Part II: We place a lower bound on the value of (C.34) that uniformly applies across all L. Without loss of generality, we assume that $q(1,0) \geq q(0,1)$, and therefore, $q(1,0) \geq 1/2$. The expressions for agent 1's reporting cutoffs are given by:

$$\omega_1^* = b - c\frac{q(0,1)}{q(1,0)}\Big(1 - p_x\Psi_2^* - (1-p_x)\Psi_2^{**}\Big)$$

and

$$\omega_1^{**} = -c\frac{q(0,1)}{q(1,0)}\Big(1 - p_y\Psi_2^* - (1-p_y)\Psi_2^{**}\Big)$$

for some $p_x, p_y \in [0,1]$, which are agent 1's beliefs about θ_2 conditional on each realization of θ_1. The difference between them is given by:

$$\omega_1^* - \omega_1^{**} = b - c\frac{q(0,1)}{q(1,0)}(p_x - p_y)(\Psi_2^* - \Psi_2^{**}). \tag{C.36}$$

where the absolute value of

$$c\frac{q(0,1)}{q(1,0)}(p_x - p_y)$$

is at most c. To bound the LHS of (C.34) from below, we proceed according to the following two steps.

Step 1: Lower bound on ω_1^* According to the expression for ω_1^* and using the assumption that $q(1,0) \geq q(0,1)$, we have:

$$\omega_1^* \geq b - c\Big(1 - p_x\Psi_2^* - (1-p_x)\Psi_2^{**}\Big) \geq b - c\delta(1 - \Phi(0)). \tag{C.37}$$

Let this lower bound be $\underline{\omega}_1^*$.

Step 2: Lower bound on (C.34) This can be accomplished by establishing strictly positive lower bounds on either of the following expressions: $\Psi_1^* - \Psi_1^{**}$ or $q(0,1)(\Psi_2^* - \Psi_2^{**})$. The former is sufficient since $q(1,0) \geq q(0,1)$ and $q(1,0) + q(0,1) \geq q(1,1) = 1$, implying that $q(1,0) \geq 1/2$.

The case in which $p_x - p_y \leq 0$ is straightforward since $\omega_1^* - \omega_1^{**} \geq b$. The lower bound on ω_1^* then implies a strictly positive lower bound on $\Psi_1^* - \Psi_1^{**}$. The case in which $p_x - p_y > 0$ follows similarly from the last step of subsection C.2.1. To illustrate the details, we consider two cases separately.

First, suppose $\Psi_1^* - \Psi_1^{**} \geq \Psi_2^* - \Psi_2^{**}$, then we have:

$$\frac{\Psi_1^* - \Psi_1^{**}}{\phi(\underline{\omega}_1^* - b)} \geq \omega_1^* - \omega_1^{**} = b - c(\Psi_2^* - \Psi_2^{**}) \geq b - c(\Psi_1^* - \Psi_1^{**}). \tag{C.38}$$

This yields a strictly positive lower bound on $\Psi_1^* - \Psi_1^{**}$.

Second, suppose $\Psi_1^* - \Psi_1^{**} < \Psi_2^* - \Psi_2^{**}$, then let $\beta \equiv (\omega_1^* - \omega_1^{**})/b$ which is between 0 and 1 due to the assumption that $p_x - p_y > 0$. Equality (C.36) implies that:

$$\omega_1^* - \omega_1^{**} = b - c\frac{q(0,1)}{q(1,0)}(p_x - p_y)(\Psi_2^* - \Psi_2^{**}) \geq b - c(\Psi_2^* - \Psi_2^{**})$$

which yields

$$\Psi_2^* \geq \Psi_2^* - \Psi_2^{**} \geq (1-\beta)b/c. \tag{C.39}$$

This leads to a lower bound on the cutoff ω_2^*, which we can show to be a decreasing function of β, and which we denote $\widetilde{\omega}(\beta)$. We also have:

$$\frac{1}{\delta}(\Psi_1^* - \Psi_1^{**}) = \Phi(\omega_1^*) - \Phi(\omega_1^{**}) \geq \beta b \phi(\underline{\omega}_1^* - b). \tag{C.40}$$

We consider two subcases, depending on the value of β relative to 1/2.

1. If $\beta \geq 1/2$, then (C.40) implies that

$$\Psi_1^* - \Psi_1^{**} \geq b\delta\phi(\underline{\omega}_1^* - b)/2. \tag{C.41}$$

2. If $\beta < 1/2$, then (C.39) implies that:

$$\Psi_2^* - \Psi_2^{**} \geq b/2c \tag{C.42}$$

   Since

$$\omega_2^* = b - c(1-Q)\frac{q(1,0)}{q(0,1)} \geq \underline{\omega}_2(\beta) \tag{C.43}$$

   where Q is some number between 0 and $(1-\delta)\alpha + \delta\Phi(0)$. This yields the following lower bound on $q(0,1)$, namely

$$q(0,1) \geq \frac{b - c(1-Q)q(1,0)}{\underline{\omega}_2(\beta)} \geq \frac{b-c}{2\underline{\omega}_2(\beta)} \tag{C.44}$$

which is strictly bounded above 0 for all $\beta < 1/2$. This together with (C.42) lead to the following lower bound on the RHS of (C.34):

$$q(0,1)(\Psi_2^* - \Psi_2^{**}) \geq \frac{(b-c)b}{4c\underline{\omega}_2(\beta)}. \tag{C.45}$$

C.2.4 Proof of Lemma C.2

Consider toward a contradiction an equilibrium for which the value of (C.7) being strictly positive, $\omega_1^* > \omega_2^*$, and $q(1,0) < q(0,1)$. Then, (C.8) implies that $\Phi(\omega_2^{**}) > \Phi(\omega_1^{**})$ or equivalently, $\omega_2^{**} > \omega_1^{**}$. This together with $\omega_1^* > \omega_1^{**}$ and $\omega_2^* > \omega_2^{**}$ imply that:

$$\omega_1^{**} < \omega_2^{**} < \omega_2^* < \omega_1^*. \tag{C.46}$$

We start from showing that $p_1, p_2 > 0$. Suppose toward a contradiction that $p_1 = 0$ and $p_2 > 0$. Then, (C.10) implies that $X_1 = \Psi_1^{**}$. This implies that $\omega_2^* - \omega_2^{**} = b > \omega_1^* - \omega_1^{**}$, which contradicts (C.46). Suppose toward another contradiction that $p_1 > 0$ and $p_2 = 0$. Then,

$$p_1 \frac{\Psi_1^*}{\Psi_1^{**}} + p_2 \frac{1-\Psi_2^*}{1-\Psi_2^{**}} > p_2 \frac{\Psi_2^*}{\Psi_2^{**}} + p_1 \frac{1-\Psi_1^*}{1-\Psi_1^{**}}. \tag{C.47}$$

This means that the evaluator attaches a higher probability to $\overline{\theta} = 1$ when only agent 1 accuses the principal than when only agent 2 does. This implies that $q(1,0) \geq q(0,1)$, which leads to a contradiction.

Having established that p_1, p_2 are both interior, we know that (C.13) and (C.14) must be equal to each other. From (C.8), used for both agents, we have

$$\begin{aligned} \left|\frac{\omega_1^* - b}{\omega_2^* - b}\right| &= \frac{1-\Psi_2^{**}}{1-\Psi_1^{**}} \cdot \frac{1-q(1,0)}{1-q(0,1)} \cdot \frac{q(0,1) + \Psi_1^{**}(1-q(1,0)-q(0,1))}{q(1,0) + \Psi_2^{**}(1-q(1,0)-q(0,1))} \\ &= \frac{1-\Psi_2^{**}}{1-\Psi_1^{**}} \cdot \frac{1-q(1,0)}{1-q(0,1)} \cdot \frac{\Psi_1^* - \Psi_1^{**}}{\Psi_2^* - \Psi_2^{**}}. \end{aligned} \tag{C.48}$$

Since

$$\frac{1-\Psi_1^{**}}{1-\Psi_2^{**}} < \frac{\Psi_1^* - \Psi_1^{**}}{\Psi_1^* - \Psi_2^{**}} \leq \frac{\Psi_1^* - \Psi_1^{**}}{\Psi_2^* - \Psi_2^{**}},$$

we get

$$1 \geq \left|\frac{\omega_1^* - b}{\omega_2^* - b}\right| > \frac{1-q(1,0)}{1-q(0,1)}. \tag{C.49}$$

The RHS of (C.49) is greater than 1, since $q(1,0) < q(0,1)$, which leads the desired contradiction.

D Mitigating Punishments

In Appendix D.1, we prove the second part of Proposition 4 by constructing equilibria in which the principal's decisions are strategic complements when L belongs to an open interval. In Appendix D.2, we prove the first part of Proposition 4, which states that there exists a range of values of L for which the principal's decisions are strategic complements in all symmetric Bayesian Nash Equilibria that satisfy Axiom 1, as well as in all sequential equilibria that satisfy Axioms 1, 2 and 3.

D.1 Proof of Proposition 4: Limiting Properties

We construct an interval of L such that there exists a symmetric equilibrium in which $q(1,1) = 1$, $q(1,0) = q(0,1) = q$ and $q(0,0) = 0$ with $q \geq 1/2$. The value of (C.7) is strictly negative. According to Lemma C.1, the principal's decisions to commit crimes against the agents are strategic complements. Therefore in equilibrium, the principal either chooses $\theta_1 = \theta_2 = 1$ or chooses $\theta_1 = \theta_2 = 0$ but he never commits crime against exactly one agent. When $\theta_i = 1$, agent i prefers to accuse the principal if

$$\omega_i \leq \omega^* \equiv b - \frac{c(1-q)(1-\Psi^*)}{q + \Psi^*(1-2q)}. \tag{D.1}$$

When $\theta_i = 0$, agent i prefers to accuse the principal if

$$\omega_i \leq \omega^{**} \equiv -\frac{c(1-q)(1-\Psi^{**})}{q + \Psi^{**}(1-2q)}. \tag{D.2}$$

The principal's indifference condition is given by:

$$2/L = (\Psi^* - \Psi^{**})\Big((1-2q)(\Psi^* + \Psi^{**}) + 2q\Big), \tag{D.3}$$

where

$$\Psi^* \equiv \delta\Phi(\omega^*) + (1-\delta) \quad \text{and} \quad \Psi^{**} \equiv \delta\Phi(\omega^{**}) + (1-\delta).$$

Moreover, the equilibrium probability of crime, denoted by π_m, is pinned down by:

$$\frac{\Psi^*(1-\Psi^*)}{\Psi^{**}(1-\Psi^{**})} = \frac{\pi^*}{1-\pi^*} \Big/ \frac{\pi_m}{1-\pi_m}, \tag{D.4}$$

in which

$$\mathcal{I} \equiv \frac{\Psi^*(1-\Psi^*)}{\Psi^{**}(1-\Psi^{**})}$$

measures the aggregate informativeness of reports. This is the right measure for informativeness, because in such equilibria, one report is sufficient to convict the principal and, hence, the evaluator is indifferent between conviction and acquittal when exactly one report is made against the principal.

Comparing (D.1) to (D.2), we know that $\omega^* - \omega^{**} > b$. Rewrite (D.1) and (D.2) as:

$$\frac{\omega^* - b}{c} = \frac{\Psi^* - 1}{\Psi^* + (1 - \Psi^*)\frac{q}{1-q}} \tag{D.5}$$

and

$$\frac{\omega^{**}}{c} = \frac{\Psi^{**} - 1}{\Psi^{**} + (1 - \Psi^{**})\frac{q}{1-q}}. \tag{D.6}$$

For every $q \in [1/2, 1]$, one can verify that

$$\frac{\Psi - 1}{\Psi + (1 - \Psi)\frac{q}{1-q}}$$

is a convex function of Ψ and the density function of ω is strictly increasing when $\omega \le 0$. As a result, when $\omega \le 0$,

$$\frac{\Psi(\omega) - 1}{\Psi(\omega) + (1 - \Psi(\omega))\frac{q}{1-q}}$$

is strictly increasing and convex in ω, and moreover, it is bounded between $[-1, 0]$.

When $\omega^* = b$, the LHS of (D.5) is strictly greater than its RHS, the concavity of the RHS of (D.5) suggests that equation (D.5) admits a unique solution, which pin down the value of ω^* in equilibrium. Similarly, (D.6) also admits a unique solution, which pins down the value of ω^{**} in equilibrium.

When q increases, the value of the RHS of (D.5) and (D.6) increase for all values of ω. As a result, the equilibrium values of ω^* and ω^{**} also increase with q. Due to the convexity and boundedness of the RHS as a function of ω, both ω^* and ω^{**} change continuously with q.

Let $\omega^*(c, q)$ and $\omega^{**}(c, q)$ denote the values of the cutoffs in equilibrium, and $L(c, q)$ denote the value of L determined by (D.3) when $\omega^* = \omega^*(c, q)$ and $\omega^{**} = \omega^{**}(c, q)$. For every $c > 0$ and

$$L \in \Big[\min_{q \in [1/2,1]} L(c, q), \max_{q \in [1/2,1]} L(c, q) \Big],$$

there exists $q \in [1/2, 1]$, such that when the retaliation cost is c and the punishment level is L, there exists an equilibrium such that $q(1, 1) = 1$, $q(1, 0) = q(0, 1) = q$ and $q(0, 0) = 0$.

For every $q \in [1/2, 1]$, as $c \to \infty$, both $\omega^*(c, q)$ and $\omega^{**}(c, q)$ go to minus infinity. Since $\omega^* - \omega^{**} > b$, we know that $\Psi^*/\Psi^{**} \to \infty$ as $c \to \infty$. Since $(1 - \Psi^*)/(1 - \Psi^{**}) \to 1$, we know that $\mathcal{I} \to \infty$.

D.2 Proof of Proposition 4: Conviction Probabilities under Moderate Punishment

Recall the definition of $L(c, q)$ in the previous subsection, which can be computed via (D.3), (D.5) and (D.6) for all values of $(c, q) \in \mathbb{R}_+ \times [1/2, 1]$. For every c, let

$$\underline{L}(c) \equiv \max_{q \in [1/2,1]} L(c, q).$$

We show the following result:

Proposition D.1. *For every $c > 0$, there exists $\varepsilon > 0$ such that when $L \in [\underline{L}(c), \underline{L}(c) + \varepsilon]$, in every equilibrium that satisfies Axioms 1 and 2, the conviction probabilities satisfy:*

$$q(0, 0) + q(1, 1) - q(1, 0) - q(0, 1) < 0.$$

This is equivalent to say that in every equilibrium, the principal's decisions are strategic complements and committing crime against only one agent is strictly suboptimal. Since $L(c, 1) \geq \underline{L}(c)$ and $L(c, 1/2) \geq \underline{L}(c)$. To prove Proposition D.1, it is sufficient to show that in every equilibrium such that $q(0, 0) + q(1, 1) - q(1, 0) - q(0, 1) \geq 0$, the required level of punishment L is strictly above $L(c, 1)$ or is strictly above $L(c, 1/2)$. For future reference, let $(\omega_0^*, \omega_0^{**})$ be the unique solution to

$$\frac{\omega_0^* - b}{c} = \Psi_0^* - 1 \quad \text{and} \quad \frac{\omega_0^{**}}{c} = \Psi_0^{**} - 1,$$

where $\Psi_0^* \equiv \delta\Phi(\omega_0^*) + (1 - \delta)$ and $\Psi_0^{**} \equiv \delta\Phi(\omega_0^{**}) + (1 - \delta)$. We know that ω_0^* and ω_0^{**} are the reporting cutoffs when $q(1, 0) = q(0, 1) = 1/2$. Therefore,

$$L(c, 1/2) = \frac{2}{\Psi_0^* - \Psi_0^{**}}. \tag{D.7}$$

The rest of the proof consists of two parts. In subsection D.3, we rule out equilibria in which $q(0, 1) = q(1, 0) = 0$. In subsection D.4, we rule out equilibria in which $\max\{q(0, 1), q(1, 0)\} > 0$ but $q(0, 1) + q(1, 0) \leq 1$.

D.3 Equilibria in which $\mathbf{q(1, 0) = q(0, 1) = 0}$

According to Online Appendix B, given Axioms 1 and 2, it is without loss of generality to focus on symmetric equilibria when $q(0, 0) = q(1, 0) = q(0, 1) = 0$. Let $q \equiv q(1, 1) \in (0, 1]$ be the conviction probability when there are two accusations. Let ω_m^* and ω_m^{**} be the agent's reporting cutoffs, which are given by (3.8) and (3.9) in the main text, respectively. Let $\Psi_1^* \equiv \delta\Psi(\omega_m^*) + (1-\delta)\alpha$ and let $\Psi_1^{**} \equiv \delta\Psi(\omega_m^{**}) + (1-\delta)\alpha$. The principal's indifference condition is given by:

$$\frac{1}{L} = q\Psi_1^{**}(\Psi_1^* - \Psi_1^{**}).$$

In what follows, we show that $L > L(c, 1/2)$. It is sufficient to show that:

$$\Psi_0^* - \Psi_0^{**} > \Psi_1^{**}(\Psi_1^* - \Psi_1^{**}). \tag{D.8}$$

From (3.8) in the main text, we have:

$$\omega_1^* = b + c - \frac{c}{q\Psi_1^{**}} \leq b + c - \frac{c}{\Psi_1^*} \leq b + c(\Psi_1^* - 1).$$

On the other hand,

$$\omega_0^* = b + c(\Psi_0^* - 1).$$

Since $c(\Psi(\omega) - 1)$ is strictly convex in ω when $\omega < 0$, and the value of $c(\Psi(\omega) - 1)$ is strictly negative when $\omega = 0$, we know that ω_1^* is strictly below ω_0^*. Since $\omega_0^* - \omega_0^{**} > b > \omega_1^* - \omega_1^{**}$, we know that

$$\Psi_0^* - \Psi_0^{**} > \Psi_1^* - \Psi_1^{**}. \tag{D.9}$$

This in turn implies (D.8).

D.4 $q(1,0)$ or $q(0,1)$ is positive and (C.7) is positive

Suppose toward a contradiction that there exists an equilibrium such that first, $q(1,0)+q(0,1) < q(1,1)+q(0,0)$, and second, either $q(0,1)$ or $q(1,0)$ is strictly positive or both. For notation simplicity, let $q_1 \equiv q(1,0)$ and $q_2 \equiv q(0,1)$. For $i \in \{1,2\}$, let p_i be the probability with which $\theta_i = 0$. Let ω_i^* and ω_i^{**} be the agent i's reporting cutoffs, with expressions given by:

$$\omega_i^* = b - c\frac{(1-\Psi_j^{**})(1-q_i)}{q_i + \Psi_j^{**}(1-q_1-q_2)} \tag{D.10}$$

and

$$\omega_i^{**} = -c\frac{(1-X_j)(1-q_i)}{q_i + X_j(1-q_1-q_2)} \tag{D.11}$$

in which $i \in \{1,2\}$, $j \equiv 3-i$ and

$$X_i \equiv \frac{1-p_1-p_2}{1-p_i}\Psi_i^{**} + \frac{p_j}{1-p_i}\Psi_i^*.$$

For $i \in \{1,2\}$, let

$$\mathcal{I}_i \equiv \frac{p_i}{p_i+p_j}\frac{\Psi_i^*}{\Psi_i^{**}} + \frac{p_j}{p_i+p_j}\frac{1-\Psi_j^*}{1-\Psi_j^{**}}.$$

The prior probability of guilt of the principal is p_1+p_2. Since the principal is convicted with positive probability after one report, then:

$$\max\{\mathcal{I}_1,\mathcal{I}_2\} \geq l^*\frac{1-p_1-p_2}{p_1+p_2} \geq \min\{\mathcal{I}_1,\mathcal{I}_2\}.$$

Step 1: We rule out equilibria in which the principal's marginal costs of committing crime against the two agents are different. Suppose toward a contradiction that the cost of committing crime against agent 1 is strictly higher compared to the cost of committing crime against agent 2, then $p_1 = 0$ and $p_2 > 0$. This implies that:

$$\mathcal{I}_2 = \frac{\Psi_2^*}{\Psi_2^{**}} > 1 > \frac{1-\Psi_2^*}{1-\Psi_2^{**}} = \mathcal{I}_1,$$

and therefore, $q_1 = 0$ and $q_2 > 0$. Therefore, the marginal cost of committing crime against agent 1 conditional on $\theta_2 = 0$ is

$$L(\Psi_1^* - \Psi_1^{**})(1-q_2)\Psi_2^{**}$$

The marginal cost of committing crime against agent 2 conditional on $\theta_1 = 0$ is:

$$L(\Psi_2^* - \Psi_2^{**})\Big((1-q_2)\Psi_1^{**} + q_2\Big),$$

which equals 1 in equilibrium. Since the marginal cost of committing crime against agent 1 is strictly higher, we have:

$$\frac{\Psi_1^*\Psi_2^{**} - \Psi_1^{**}\Psi_2^*}{\Psi_2^* - \Psi_2^{**}} \geq \frac{q_2}{1-q_2}. \tag{D.12}$$

An implication of (D.12) is that $\Psi_1^*/\Psi_1^{**} > \Psi_2^*/\Psi_2^{**}$ The properness axiom implies that $\omega_2^* - \omega_2^{**} = b > \omega_1^* - \omega_1^{**}$. This can only be the case when $\omega_1^{**} < \omega_2^{**}$. Since the density of ω is strictly increasing when $\omega < 0$, we have

$$\Psi_1^* - \Psi_1^{**} < \Psi_2^* - \Psi_2^{**} < \Psi(0) - \Psi(-b). \tag{D.13}$$

When L is close to $\underline{L}(c)$, the equilibrium conditions imply that

$$\frac{1}{(\Psi_2^* - \Psi_2^{**})\Big((1-q_2)\Psi_1^{**} + q_2\Big)} \leq L(c, 1),$$

or equivalently,

$$q_2 \geq -\frac{\Psi_1^{**}}{1-\Psi_1^{**}} + \frac{(\Psi(0) - \Psi(-b))(2 - \Psi(0) - \Psi(-b))}{2(1-\Psi_1^{**})(\Psi_2^* - \Psi_2^{**})}.$$

Since $\Psi(0), \Psi(-b) < 1/2$, a necessary condition for this is:

$$q_2 \geq 1 - \frac{1}{1-\Psi_1^{**}} + \frac{\Psi(0) - \Psi(-b)}{2(1-\Psi_1^{**})(\Psi_2^* - \Psi_2^{**})}. \tag{D.14}$$

Plugging (D.14) into (D.12), we have

$$\frac{\Psi_1^*\Psi_2^{**} - \Psi_1^{**}\Psi_2^*}{\Psi_2^* - \Psi_2^{**}} \geq \frac{(\Psi(0) - \Psi(-b)) - 2\Psi_1^{**}(\Psi_2^* - \Psi_2^{**})}{2(\Psi_2^* - \Psi_2^{**}) - (\Psi(0) - \Psi(-b))}. \tag{D.15}$$

Let $\Delta \equiv \Psi(0) - \Psi(-b)$ and $\Delta_i \equiv \Psi_i^* - \Psi_i^{**}$, the above inequality can be rewritten as:

$$2\Delta_1\Delta_2\Psi_2^{**} \geq \Delta(\Psi_2^*(1-\Psi_1^{**}) - (1-\Psi_1^*)\Psi_2^{**}) = \Delta\Delta_2(1-\Psi_1^{**}) + \Delta\Delta_1\Psi_2^{**}. \tag{D.16}$$

From (D.13), as well as the fact that $1 > \Psi_1^{**} + \Psi_2^{**}$, we know that (D.16) cannot be true. This leads to a contradiction.

Step 2: According to Step 1, it is without loss of generality to focus on equilibria in which the principal's marginal costs of committing crime against agent 1 and committing crime against agent 2 are the same. This leads to the following indifference condition:

$$L = \frac{1}{(\Psi_1^* - \Psi_1^{**})\Big(\Psi_2^{**}(1-q_1-q_2) + q_1\Big)} = \frac{1}{(\Psi_2^* - \Psi_2^{**})\Big(\Psi_1^{**}(1-q_1-q_2) + q_2\Big)}. \tag{D.17}$$

Without loss of generality, we assume $q_1 \leq q_2$. Since $q_1 + q_2 \leq 1$, we know that

$$L = \frac{1}{(\Psi_1^* - \Psi_1^{**})\Big(\Psi_2^{**}(1-q_1-q_2) + q_1\Big)} \geq \frac{2}{\Psi_1^* - \Psi_1^{**}}.$$

In what follows, we show that

$$\frac{2}{\Psi_1^* - \Psi_1^{**}} > L(c,1) = \frac{2}{(\Psi(0) - \Psi(-b))(2 - \Psi(0) - \Psi(-b))}.$$

Since $\Psi(b) < 1/2$ and $\Psi(0) < 1/2$, the above inequality is implied by:

$$\Psi(b) - \Psi(0) > \Psi_1^* - \Psi_1^{**}. \tag{D.18}$$

The above inequality is true since $\omega_1^* - \omega_1^{**} < b$, $\omega_1^* < 0$ and the density of ω is strictly increasing when ω is negative.

D.5 $q(1,0)$ or $q(0,1)$ is positive and (C.7) is zero

We start by ruling out equilibria in which one of the agents is never victim of a crime. Suppose toward a contradiction that the principal never commits crime against agent 1. Then, as in the previous subsection, we have $q(1,0) = 0$. Since $q(0,0) = 0$, we know that $q(0,1) = q(1,1)$. This contradicts the conclusion of Lemma 3.1, which results from the presumption of innocence axiom.

Next, we rule out equilibria in which $q(1,1) \neq 1$. Suppose $q(1,1) \in (0,1)$. Then either $q(0,1), q(1,0) \in (0,1)$, which has been ruled out by the argument of Online Appendix C.3. Or $q(1,0) = 0$ or $q(0,1) = 0$, which has been ruled out by Lemma 3.1 and the presumption of innocence axiom (Axiom 1).

Therefore, it is without loss of generality to consider equilibria with the following two features: (1) the principal's marginal cost of committing crime against each agent is the same, and (2) $q(1,1) = 1$, $q(1,0), q(0,1) \in (0,1)$ with $q(0,1) + q(1,0) = 1$. Since the marginal costs of crime against each agent are the same, we have

$$L = \frac{1}{q_1(\Psi_1^* - \Psi_1^{**})} = \frac{1}{q_2(\Psi_2^* - \Psi_2^{**})}. \tag{D.19}$$

Step 1: First, we establish the result when the equilibrium is symmetric, namely, $q_1 = q_2 = 1/2$. For this purpose, we need to show that:

$$\frac{2}{\Psi_1^* - \Psi_1^{**}} > L(c,1) = \frac{2}{(\Psi(0) - \Psi(-b))(2 - \Psi(0) - \Psi(-b))}.$$

The above inequality is implied by

$$\Psi(0) - \Psi(-b) > \Psi_1^* - \Psi_1^{**}. \tag{D.20}$$

To show (D.20), let $\overline{\omega}$ be determined by

$$\Psi(\overline{\omega}) \equiv \Psi(\omega^*) - \Psi(0) + \Psi(-b).$$

Inequality (D.20) is equivalent to $\overline{\omega} < \omega^{**}$, or equivalently,

$$\Psi(\overline{\omega}) - 1 > \frac{\overline{\omega} + b}{c}. \tag{D.21}$$

Plugging in the following expression for c into (D.21)

$$c = \frac{\omega^*}{\Psi(\omega^*) - 1},$$

we have

$$\Big(\Psi(\omega^*) - \Psi(0) + \Psi(-b) - 1\Big)\frac{\omega^*}{\Psi(\omega^*) - 1} > \overline{\omega} + b.$$

This is equivalent to

$$\omega^* + \underbrace{(\Psi(0) - \Psi(-b))\frac{\omega^*}{1 - \Psi(\omega^*)}}_{>0} > \overline{\omega} + b. \tag{D.22}$$

Since the density of ω is strictly increasing when $\omega < 0$, we know from $\omega^* < 0$ that

$$\Psi(\omega^*) - \Psi(\omega^* - b) < \Psi(0) - \Psi(-b),$$

This implies that $\omega^* > \overline{\omega} + b$, which verifies inequality (D.22).

Step 2: In this step, we consider asymmetric equilibria in which $q_1 \neq q_2$. Agent i's reporting cutoffs are bounded by

$$\frac{\omega_i^*}{c} \leq \frac{q_j}{q_i}(\Psi_j^* - 1) \quad \text{and} \quad \frac{\omega_i^{**} + b}{c} \geq \frac{q_j}{q_i}(\Psi_j^{**} - 1).$$

Since $\Psi(\cdot)$ is convex when $\omega < 0$, for fixed q_1 and q_2 such that $q_1 + q_2 = 1$, (ω_1^*, ω_2^*) is bounded from above by the largest solution to

$$\frac{\omega_1^*}{c} = \frac{q_2}{q_1}(\Psi_2^* - 1) \quad \text{and} \quad \frac{\omega_2^*}{c} = \frac{q_1}{q_2}(\Psi_1^* - 1).$$

Similarly, $(\omega_1^{**}, \omega_2^{**})$ is bounded from below by the smallest solution to:

$$\frac{\omega_1^{**}+b}{c} = \frac{q_2}{q_1}(\Psi_2^{**}-1) \quad \text{and} \quad \frac{\omega_2^{**}+b}{c} = \frac{q_1}{q_2}(\Psi_1^{**}-1).$$

Let $\{\omega_i^*(q_1)\}_{i=1}^2$ be the largest solution to the first system of equations and let $\{\omega_i^{**}(q_1)\}_{i=1}^2$ be the smallest solution to the second system of equations. The minimum L in this class of equilibria is bounded from below by

$$\max_{i\in\{1,2\}} \frac{1}{q_i\Big(\Psi(\omega_i^*(q_1)) - \Psi(\omega_i^{**}(q_1))\Big)}. \tag{D.23}$$

We start from showing that when $q_1 < 1/2$, then $\omega_2^*(q_1) > \omega_1^*(q_1)$ and $\omega_2^{**}(q_1) > \omega_1^{**}(q_1)$. Suppose toward a contradiction that $\omega_2^*(q_1) \leq \omega_1^*(q_1)$. Let $\alpha \equiv (q_2/q_1)^2$, which is strictly greater than 1. We have:

$$\alpha(\Psi_2^*(q_1)-1) - (\Psi_1^*(q_1)-1) > 0,$$

which is equivalent to

$$\underbrace{(1-\alpha)(1-\Psi_2^*(q_1))}_{<0} + \underbrace{\Psi_2^*(q_1) - \Psi_1^*(q_1)}_{<0 \text{ by hypothesis}} > 0.$$

This leads to a contradiction.

Next, we show that $\omega_1^*(q_1) < \omega_1^*(1/2) < \omega_2^*(q_1)$ and $\omega_1^{**}(q_1) < \omega_1^{**}(1/2) < \omega_2^{**}(q_1)$. This is because for every $q_1 \in (0, 1/2]$,

$$\frac{\omega_1^*(q_1)\omega_2^*(q_1)}{c^2} = \Big(\Psi_1^*(q_1) - 1\Big)\Big(\Psi_2^*(q_1) - 1\Big). \tag{D.24}$$

Since $\Psi(\omega)$ is strictly convex when $\omega < 0$, we know that

$$\omega \geq \Psi(\omega) - 1$$

if and only if $\omega \geq \omega^*(1/2)$. This together with (D.24) imply that $\omega_1^*(q_1) < \omega_1^*(1/2) < \omega_2^*(q_1)$. Similarly, one can show that $\omega_1^{**}(q_1) < \omega_1^{**}(1/2) < \omega_2^{**}(q_1)$.

Last, suppose toward a contradiction that

$$\frac{1}{2}(\Psi^* - \Psi^{**}) < \min\{q_1(\Psi_1^* - \Psi_1^{**}), q_2(\Psi_2^* - \Psi_2^{**})\}. \tag{D.25}$$

This implies that

$$\Big(\omega^*(1/2) - (\omega^{**}(1/2) + b)\Big)^2 \geq 4q_1q_2\Big(\omega_1^*(q_1) - (\omega_1^{**}(q_1) + b)\Big)\Big(\omega_2^*(q_1) - (\omega_2^{**}(q_1) + b)\Big),$$

which violates the convexity of Ψ^* and yields the desired contradiction.

E Monetary Transfers

E.1 Proof of Proposition 5

We start from analyzing the agents' incentives. Agent 1's reporting cutoffs are given by

$$\omega_1^* = b + c + \frac{1}{q\Psi_2^{**}}\Big\{\Psi_2^{**}\big(t_1(1,1) - t_1(0,1)\big) + (1-\Psi_2^{**})\big(t_1(1,0) - t_1(0,0)\big) - c\Big\}$$

when $\theta_i = 0$; and

$$\omega_1^{**} = c + \frac{1}{qQ_2}\Big\{Q_2\big(t_1(1,1) - t_1(0,1)\big) + (1-Q_2)\big(t_1(1,0) - t_1(0,0)\big) - c\Big\}$$

when $\theta_i = 1$, where

$$Q_2 \equiv \frac{1-p_1-p_2}{1-p_1}\Psi_2^{**} + \frac{p_2}{1-p_1}\Psi_2^*.$$

The equilibrium condition

$$\mathcal{I}_m = \frac{\pi^*}{1-\pi^*}\Big/\frac{p_1+p_2}{1-p_1-p_2},$$

implies that

$$p_1 + p_2 = \frac{l^*}{l^* + \mathcal{I}_m}.$$

We then obtain

$$Q_2 = \Psi_2^{**}\frac{\mathcal{I}_m + (1-\alpha)l^*\mathcal{I}_2}{(1-\alpha)l^* + \mathcal{I}_m},$$

where $\alpha \equiv p_1/(p_1+p_2)$. Let $\Delta_1 \equiv t_1(1,0) - t_1(0,0)$ and $\Delta_2 \equiv t_2(0,1) - t_2(0,0)$. Subtracting ω_1^{**} from ω_1^*, we get

$$\omega_1^* - \omega_1^{**} = b + \frac{1}{q}\Big(\frac{1}{\Psi_2^{**}} - \frac{1}{Q_2}\Big)(\Delta_1 - c). \tag{E.1}$$

Similarly, the distance between agent 2's reporting cutoffs is given by

$$\omega_2^* - \omega_2^{**} = b + \frac{1}{q}\Big(\frac{1}{\Psi_1^{**}} - \frac{1}{Q_1}\Big)(\Delta_2 - c). \tag{E.2}$$

That is, whether $\omega_i^* - \omega_i^{**}$ is larger or smaller than b depends only on the sign of $\Delta_i - c$.

Under the transfer scheme proposed in Proposition 5, each agent's incentive to report does not depend on his belief about the other agent's strategy. That is,

$$\omega_1^* = \omega_2^* = b + c - \frac{c}{q_m}, \quad \omega_1^{**} = \omega_2^{**} = c - \frac{c}{q_m}.$$

The principal's incentive constraint is given by following indifference condition:

$$1/L = q_m(\Psi_1^* - \Psi_1^{**})\Psi_2^{**} = q_m(\Psi_2^* - \Psi_2^{**})\Psi_1^{**}.$$

As $q_m \to 0$ when $L \to \infty$, we know that $\omega^*, \omega^{**} \to -\infty$. The informativeness ratio $\mathcal{I}_m$ diverges to $+\infty$ and the equilibrium probability of crime $p_1 + p_2$ converges to 0.

E.2 Budget-Balanced Transfer Schemes

In this section, we examine the limitations of budget-balanced transfer schemes to improve the informativeness of reports and to reduce the probability of crime. We show that when transfer schemes are required to be budget balanced, the informativeness of the agents' report is uniformly bounded from above in all equilibria that satisfies presumption of innocence, monotonicity and properness. This includes asymmetric equilibria in which different agents adopt different equilibrium strategies and the principal treats different agents differently.

Proposition E.1. *There exist $\overline{\mathcal{I}} > 1$, $\underline{\pi} \in (0, \pi^*)$ and $\overline{L}$ such that for all sequential equilibria that satisfy Axioms 1, 2 and 3 under all budget balanced transfer schemes for all $L > \overline{L}$, the informativeness ratio $\mathcal{I}_m$ is less than $\overline{\mathcal{I}}$ and the equilibrium probability of crime π_m is greater than $\underline{\pi}$.*

E.3 Proof of Proposition E.1

Recall that $\Delta_1 \equiv t_1(1,0) - t_1(0,0)$ and $\Delta_2 \equiv t_2(0,1) - t_2(0,0)$. Without loss of generality, let $t_1(0,0) = t_2(0,0) = 0$. Then $t_1(1,0) = -t_2(1,0) = \Delta_1$, $-t_1(0,1) = t_2(0,1) = \Delta_2$. Let $t_1(1,1) = T$, then $t_2(1,1) = -T$. The two agents' reporting cutoffs are then given by:

$$\omega_1^* = b + c + \frac{1}{q}(T + \Delta_2 - \Delta_1) + \frac{1}{q\Psi_2^{**}}(\Delta_1 - c), \tag{E.3}$$

$$\omega_1^{**} = c + \frac{1}{q}(T + \Delta_2 - \Delta_1) + \frac{1}{qQ_2}(\Delta_1 - c), \tag{E.4}$$

$$\omega_2^* = b + c + \frac{1}{q}(\Delta_1 - \Delta_2 - T) + \frac{1}{q\Psi_1^{**}}(\Delta_2 - c), \tag{E.5}$$

$$\omega_2^{**} = c + \frac{1}{q}(\Delta_1 - \Delta_2 - T) + \frac{1}{qQ_1}(\Delta_2 - c). \tag{E.6}$$

We consider three cases separately, depending on the signs of $\Delta_1 - c$ and $\Delta_2 - c$.

E.4 Case 1: $\Delta_1, \Delta_2 \geq c$

Suppose $\Delta_1, \Delta_2 \geq c$, then

$$\omega_1^{**} \geq c + \frac{1}{q}(T + \Delta_2 - \Delta_1) \text{ and } \omega_2^{**} \geq c + \frac{1}{q}(\Delta_1 - \Delta_2 - T)$$

Therefore,

$$\omega_1^{**} + \omega_2^{**} \geq -2b + 2c, \tag{E.7}$$

which implies that $\max\{\omega_1^{**}, \omega_2^{**}\} \geq -b + c$. Since $\mathcal{I}_m = \min\{\mathcal{I}_1, \mathcal{I}_2\}$, we know that

$$\mathcal{I}_m \leq \frac{1}{\delta\Phi(-b+c) + (1-\delta)\alpha} \leq \frac{1}{\delta\Phi(-b+c)}. \tag{E.8}$$

The above inequality establishes an upper bound on report informativeness.

E.5 Case 2: $\Delta_1, \Delta_2 < c$

Let

$$X \equiv \frac{1}{q}(\Delta_1 - \Delta_2 - T).$$

Without loss of generality, assume $X \geq 0$. Let $\beta \in (0, 1)$ be the probability with which agent 1 has witnessed crime conditional on the principal being guilty. The expressions for the two cutoffs imply that:

$$\frac{\omega_2^* - b - c - X}{\omega_2^{**} - c - X} = \frac{(1-\beta)l^*\mathcal{I}_1 + \mathcal{I}_m}{(1-\beta)l^* + \mathcal{I}_m} \quad \text{and} \quad \frac{\omega_1^* - b - c + X}{\omega_1^{**} - c + X} = \frac{\beta l^*\mathcal{I}_2 + \mathcal{I}_m}{\beta l^* + \mathcal{I}_m}. \tag{E.9}$$

We start with the following Lemma:

Lemma E.1. *There exists a function $\epsilon : \mathbb{R}_+ \times [0, 1] \to \mathbb{R}_+$ such that for every $\eta \in (0, 1)$, if $\beta \leq 1 - \eta$ and $\omega_2^* < -M$, then $\mathcal{I}_m < 1 + \epsilon(M, \eta)$.*

Proof of Lemma E.1: Since $\Delta_2 < c$, we know that $\omega_2^* - \omega_2^{**} < b$. Since $X \geq 0$, $\omega_2^* - b - c - X < 0$ and $\omega_2^{**} - c - X < 0$, we have:

$$\frac{\omega_2^* - b - c - X}{\omega_2^{**} - c - X} < \frac{\omega_2^* - b - c}{\omega_2^{**} - c} \leq \frac{M + c - b}{M + c} = 1 + \frac{c - b}{M + c}$$

Since $\mathcal{I}_1 \geq \mathcal{I}_m \geq 1$, we have

$$1 + \frac{c-b}{M+c} \geq \frac{(1-\beta)l^*\mathcal{I}_1 + \mathcal{I}_m}{(1-\beta)l^* + \mathcal{I}_m} \geq \frac{(1-\beta)l^*\mathcal{I}_m + \mathcal{I}_m}{(1-\beta)l^* + \mathcal{I}_m} \geq \frac{\eta l^*\mathcal{I}_m + \mathcal{I}_m}{\eta l^* + \mathcal{I}_m}$$

This places an upper bound on $\mathcal{I}_m$, which converges to 1 as $M \to -\infty$. □

Lemma E.1 implies that for every $\eta \in (0,1)$, if $\beta \leq 1-\eta$, the informativeness of report is bounded from above by

$$\max_{M \in \mathbb{R}_+} \Big\{ \min\{1 + \epsilon(M,\eta), \frac{1}{\Phi(-M-b)}\} \Big\}. \tag{E.10}$$

Expression (E.10) is bounded from above for every given η. Therefore, in order to establish a uniform upper bound on $\mathcal{I}_m$, we only need to show that unbounded informativeness cannot arise when α is close to 1. That is to say, it is without loss to consider cases in which $\beta \geq 1/2$. Therefore, agent 1 witnesses crime with strictly positive probability, which implies that $\mathcal{I}_m = \mathcal{I}_1 \leq \mathcal{I}_2$.

Suppose toward a contradiction that for every $\overline{\mathcal{I}} > 0$, there exists $\{\Delta_1, \Delta_2, X\}$ under which there exists an equilibrium in which $\mathcal{I}_m > \overline{\mathcal{I}}$. In what follows, we consider two subcases.

Subcase 1: $\boldsymbol{\omega_1^* - \omega_1^{**} \geq \omega_2^* - \omega_2^{**}}$ Since $\mathcal{I}_1 \leq \mathcal{I}_2$, we know that $\omega_1^{**} \geq \omega_2^{**}$. Since $\omega_1^* - \omega_1^{**} \geq \omega_2^* - \omega_2^{**}$, we have $\omega_1^* \geq \omega_2^*$. Therefore,

$$X + \frac{\Delta_2 - c}{q\Psi_1^{**}} \leq -X + \frac{\Delta_1 - c}{q\Psi_2^{**}},$$

or, equivalently,

$$X \leq \frac{1}{2}\Big(\frac{|c-\Delta_1|}{q\Psi_2^{**}} - \frac{|c-\Delta_2|}{q\Psi_1^{**}}\Big) \tag{E.11}$$

Moreover, we have

$$\omega_2^* - \omega_2^{**} = b - \frac{|c-\Delta_2|}{q\Psi_1^{**}} \cdot \frac{\beta(\mathcal{I}_1 - 1)l^*}{\mathcal{I}_m + \beta l^*\mathcal{I}_1} > 0,$$

which implies that for every $\varepsilon > 0$, there exists $\mathcal{I}^*$ such that whenever $\mathcal{I}_m > \mathcal{I}^*$,

$$\frac{|c-\Delta_2|}{q\Psi_1^{**}} \leq b\frac{1+\beta l^*}{\beta l^*} + \varepsilon.$$

Since $\beta \geq 1/2$ and the RHS is decreasing in β, we know that when $\mathcal{I}_m$ is sufficiently large,

$$X \leq \frac{b}{2} \cdot \frac{1 + l^*/3}{l^*/3}. \tag{E.12}$$

Given this uniform upper bound on X, we know that as $\omega_1^* \to -\infty$,

$$\frac{\omega_1^* - b - c + X}{\omega_1^{**} - c + X} \to 1.$$

The second part of (E.9) together with $\beta \geq 1/2$ imply that $\mathcal{I}_2$ is uniformly bounded from above as $\omega_1^* \to -\infty$. This contradicts the assumption that $\mathcal{I}_m$ is unbounded.

Subcase 2: $\boldsymbol{\omega_1^* - \omega_1^{**} < \omega_2^* - \omega_2^{**}}$ Since $\beta \geq 1/2$, the distance between ω_1^* and ω_1^{**} is at most b and

$$\frac{\omega_1^* - b - c + X}{\omega_1^{**} - c + X} = \frac{\beta l^* \mathcal{I}_2 + \mathcal{I}_m}{\beta l^* + \mathcal{I}_m},$$

if $\mathcal{I}_m$ is unbounded, then $\omega_1^* - b - c + X$ is bounded from below. That is, there exists $A \in \mathbb{R}_+$ such that

$$|\omega_1^* - b - c + X| = \frac{|c - \Delta_1|}{q\Psi_2^{**}} \leq A. \tag{E.13}$$

Since $\omega_1^* - \omega_1^{**} < \omega_2^* - \omega_2^{**}$, we know that when $\mathcal{I}_m$ is sufficiently large,

$$\frac{|c - \Delta_1|}{q\Psi_2^{**}} \cdot \frac{1-\beta}{1 + (1-\beta)l^*} \leq \frac{|c - \Delta_2|}{q\Psi_1^{**}} \cdot \frac{\beta}{1 + \beta l^*}. \tag{E.14}$$

Therefore,

$$\frac{|c - \Delta_2|}{q\Psi_1^{**}} \leq \frac{|c - \Delta_1|}{q\Psi_2^{**}} \cdot \frac{1-\beta}{\beta} \cdot (1 + l^*) \leq A(1 + l^*)\frac{1-\beta}{\beta}. \tag{E.15}$$

According to Lemma E.1, $\beta \to 1$ and $\omega_1^* \to -\infty$ are required when $\mathcal{I}_m \to \infty$. Therefore, $X \to \infty$ and

$$\frac{|c - \Delta_2|}{q\Psi_1^{**}} \to 0.$$

But from the expression

$$\omega_2^* = b + c + X + \frac{|c - \Delta_2|}{q\Psi_1^{**}},$$

we know that ω_2^* is strictly positive when $\mathcal{I}_m$ is sufficiently large. Therefore $\omega_2^{**} \geq \omega_2^* - b \geq 0$ and therefore, $\mathcal{I}_m \leq \mathcal{I}_2 \leq 1/\Phi(0)$, leading to a contradiction.

E.6 Case 3: $\Delta_1 \geq c$ and $\Delta_2 < c$

Define X in the same way as in the previous subsection. If $X \leq 0$, then

$$\omega_1^{**} \geq c$$

which implies that $\mathcal{I} \leq 1/\Phi(-b+c)$.

If $X > 0$, then

$$\frac{\omega_2^* - b - c - X}{\omega_2^{**} - c - X} \to 1$$

as $\omega_2^* \to -\infty$. Since

$$\frac{\omega_2^* - b - c - X}{\omega_2^{**} - c - X} = \frac{(1-\beta)l^*\mathcal{I}_1 + \mathcal{I}_m}{(1-\beta)l^* + \mathcal{I}_m},$$

we know that in order for $\mathcal{I}_m \to \infty$, we need $\omega_2^* \to -\infty$ and $\beta \to 1$. Therefore, it is without loss to consider situations in which

$$\beta \geq \overline{\beta} \equiv \max\{1 - 1/l^*, 1/2\}.$$

When $\beta \geq \overline{\beta}$, we know that $\mathcal{I}_m = \mathcal{I}_1 \leq \mathcal{I}_2$. Since $\omega_1^* - \omega_1^{**} \geq b > \omega_2^* - \omega_2^{**}$, we know that $\omega_2^{**} < \omega_1^{**}$, which further implies that $\omega_2^* < \omega_1^*$. This implies that

$$X + \frac{\Delta_2 - c}{q\Psi_1^{**}} \leq -X + \frac{\Delta_1 - c}{q\Psi_2^{**}}$$

which is equivalent to:

$$X \leq \frac{1}{2}\Big(\frac{|\Delta_1 - c|}{q\Psi_2^{**}} + \frac{|c - \Delta_2|}{q\Psi_1^{**}}\Big).$$

Since $\omega_2^* - \omega_2^{**} > 0$, we know that for every $\mathcal{I}_m$ above some threshold,

$$\frac{|c - \Delta_2|}{q\Psi_1^{**}} \leq b\frac{1 + \widetilde{\beta}l^*}{\widetilde{\beta}l^*},$$

where $\widetilde{\beta} \equiv \overline{\beta}/2$. Therefore

$$\begin{aligned}
\omega_1^{**} &= c - X + \frac{\Delta_1 - c}{q\Psi_2^{**}} \cdot \frac{(1-\beta)l^* + \mathcal{I}_m}{\mathcal{I}_m + (1-\beta)l^*\mathcal{I}_2} \\
&\geq c - \frac{|c - \Delta_2|}{2q\Psi_1^{**}} - \frac{|\Delta_1 - c|}{2q\Psi_2^{**}} + \frac{|\Delta_1 - c|}{q\Psi_2^{**}} \cdot \frac{(1-\beta)l^* + \mathcal{I}_m}{\mathcal{I}_m + (1-\beta)l^*\mathcal{I}_2} \\
&\geq c - b\frac{1 + \widetilde{\beta}l^*}{2\widetilde{\beta}l^*} + \frac{|\Delta_1 - c|}{q\Psi_2^{**}}\Big(\frac{(1-\beta)l^* + \mathcal{I}_m}{\mathcal{I}_m + (1-\beta)l^*\mathcal{I}_2} - \frac{1}{2}\Big) \qquad \text{(E.16)}
\end{aligned}$$

The coefficient

$$\frac{(1-\beta)l^* + \mathcal{I}_m}{\mathcal{I}_m + (1-\beta)l^*\mathcal{I}_2} - \frac{1}{2}$$

is strictly positive when $\beta \geq \overline{\beta}$ and $\mathcal{I}_m$ is sufficiently large. Therefore (E.16) implies that

$$\omega_1^{**} \geq \overline{\omega}_1^{**} \equiv c - b\frac{1+\widetilde{\beta}l^*}{2\widetilde{\beta}l^*} \tag{E.17}$$

which further implies the following upper bound on $\mathcal{I}_m$:

$$\mathcal{I}_m = \mathcal{I}_1 \leq \Phi(\overline{\omega}_1^{**})^{-1}.$$

F More Than Two Agents

This appendix consists of three parts. The proof of Proposition 7 is in section F.1. The proof of Proposition 6 is in sections F.2 and F.3. Section F.2 establishes the limiting properties of symmetric unanimous equilibria. Section F.3 shows that for every $n \geq 2$, there exists $\overline{L}_n$ such that for every $L > \overline{L}_n$, the principal is convicted with positive probability only when all agents report unanimously.

F.1 Proof of Proposition 7

We start by deriving formulas for the agents' reporting cutoffs $(\omega_n^*, \omega_n^{**})$, the informativeness of reports $\mathcal{I}_n$ and the equilibrium probability of crime π_n. In an n-agent economy and for every $i \in \{1, 2, ..., n\}$, agent i's reporting cutoff when $\theta_i = 1$ is

$$\omega_n^* = b + c - \frac{c}{q_n Q_{1,n}}. \tag{F.1}$$

His reporting cutoff when $\theta_i = 0$ is

$$\omega_n^{**} = c - \frac{c}{q_n Q_{0,n}}, \tag{F.2}$$

in which

$$Q_{1,n} \equiv \Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-1} \tag{F.3}$$

and

$$Q_{0,n} \equiv \frac{n\mathcal{I}_n}{(n-1)l^* + n\mathcal{I}_n}\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-1} + \frac{(n-1)l^*}{(n-1)l^* + n\mathcal{I}_n}\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-2}\Big(\delta\Phi(\omega_n^{*}) + (1-\delta)\alpha\Big). \tag{F.4}$$

In symmetric unanimous equilibria, the aggregate informativeness of reports is given by the ratio between the probability with which n agents report conditional on $\overline{\theta} = 1$ and the probability with which n agents report conditional on $\overline{\theta} = 0$. This implies that

$$\mathcal{I}_n = \frac{\delta\Phi(\omega_n^*) + (1-\delta)\alpha}{\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha}.$$

Since the evaluator is indifferent between convicting and acquitting the principal when there are n reports, we have

$$\mathcal{I}_n = \frac{\pi^*}{1-\pi^*} \Big/ \frac{\pi_n}{1-\pi_n}. \tag{F.5}$$

When L is large enough, the principal is indifferent between committing crime against a single agent and committing no crime, which leads to the indifference condition

$$\frac{1}{\delta L} = q_n\Big(\Phi(\omega_n^*) - \Phi(\omega_n^{**})\Big)\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-1}. \tag{F.6}$$

Reporting Cutoffs & Distance Between Cutoffs: In this part, we show that $\omega_k^* > \omega_n^*$. Suppose toward a contradiction that $\omega_k^* \le \omega_n^*$. From (F.1), we have

$$q_k\Big(\delta\Phi(\omega_k^{**}) + (1-\delta)\alpha\Big)^{k-1} \le q_n\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-1}. \tag{F.7}$$

Therefore, $q_kQ_{1,k} \le q_nQ_{1,n}$ which is equivalent to

$$\begin{aligned} q_k\Big(\delta\Phi(\omega_k^{**}) + (1-\delta)\alpha\Big)^{k-1}\Big(\Phi(\omega_n^*) - \Phi(\omega_n^{**})\Big) &\le q_n\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-1}\Big(\Phi(\omega_n^*) - \Phi(\omega_n^{**})\Big) \\ &= q_k\Big(\delta\Phi(\omega_k^{**}) + (1-\delta)\alpha\Big)^{k-1}\Big(\Phi(\omega_k^*) - \Phi(\omega_k^{**})\Big). \end{aligned}$$

This implies that

$$\Phi(\omega_n^*) - \Phi(\omega_n^{**}) \le \Phi(\omega_k^*) - \Phi(\omega_k^{**}). \tag{F.8}$$

Since $\omega_k^* \le \omega_n^*$, (F.8) is true only when

$$\omega_n^* - \omega_n^{**} \le \omega_k^* - \omega_k^{**}, \tag{F.9}$$

which in turn implies that $\omega_k^{**} \le \omega_n^{**}$ and therefore $q_kQ_{0,k} \le q_nQ_{0,n}$. Computing the two sides of (F.9) by subtracting (F.2) from (F.1), we have

$$\omega_n^* - \omega_n^{**} = b - \frac{c}{q_n}\frac{Q_{0,n} - Q_{1,n}}{Q_{1,n}Q_{0,n}} \text{ and } \omega_k^* - \omega_k^{**} = b - \frac{c}{q_k}\frac{Q_{0,k} - Q_{1,k}}{Q_{1,k}Q_{0,k}}.$$

Due to the previous conclusion that $q_k Q_{1,k} \leq q_n Q_{1,n}$ and $q_k Q_{0,k} \leq q_n Q_{0,n}$, (F.9) is true only when

$$q_n(Q_{0,n} - Q_{1,n}) \geq q_k(Q_{0,k} - Q_{1,k}). \tag{F.10}$$

Since

$$Q_{0,n} - Q_{1,n} = \frac{(n-1)l^*}{(n-1)l^* + n\mathcal{I}_n}\delta\Big(\Phi(\omega_n^*) - \Phi(\omega_n^{**})\Big)\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-2}$$

and the term

$$\delta\Big(\Phi(\omega_n^*) - \Phi(\omega_n^{**})\Big)\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big)^{n-2} = L^{-1}q_n^{-1}\frac{1}{\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha}.$$

From (F.6), we know that (F.10) is equivalent to:

$$\frac{(n-1)l^*}{(n-1)l^*\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big) + n\Big(\delta\Phi(\omega_n^*) + (1-\delta)\alpha\Big)}$$

$$\geq \frac{(k-1)l^*}{(k-1)l^*\Big(\delta\Phi(\omega_k^{**}) + (1-\delta)\alpha\Big) + k\Big(\delta\Phi(\omega_k^*) + (1-\delta)\alpha\Big)}$$

which in turn reduces to:

$$(n-1)(k-1)l^*\Big(\delta\Phi(\omega_k^{**}) + (1-\delta)\alpha\Big) + (n-1)k\Big(\delta\Phi(\omega_k^*) + (1-\delta)\alpha\Big)$$

$$\geq (n-1)(k-1)l^*\Big(\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha\Big) + (k-1)n\Big(\delta\Phi(\omega_n^*) + (1-\delta)\alpha\Big)$$

The above inequality cannot be true since $\delta\Phi(\omega_k^{**}) + (1-\delta)\alpha < \delta\Phi(\omega_n^{**}) + (1-\delta)\alpha$, $\delta\Phi(\omega_k^*) + (1-\delta)\alpha < \delta\Phi(\omega_n^*) + (1-\delta)\alpha$ and $(n-1)k < (k-1)n$. The last inequality holds due to the assumption that $k > n$. This leads to a contradiction which shows that $\omega_k^* > \omega_n^*$ whenever $k > n$.

Notice that up until the last step, we did not use the fact that $k > n$. Given the previous conclusion that $\omega_k^* > \omega_n^*$ and repeat the same reasoning up until (F.9), we know that

$$\omega_n^* - \omega_n^{**} > \omega_k^* - \omega_k^{**}, \tag{F.11}$$

and this further implies that $\omega_k^{**} > \omega_n^{**}$.

Informativeness and Probability of Crime: In this part, we show that $\mathcal{I}_n > \mathcal{I}_k$, which means the net informativeness of reports decreases with the number of agents. From the one-to-one mapping between net informativeness and the probability of at least one assault taking place, this implies that $\pi_k > \pi_n$, that is, the probability of crime increases.

Applying (F.1) and (F.2) to both n and k, we obtain the following expression for the ratios:

$$\frac{\omega_n^* - b - c}{\omega_k^* - b - c} = \frac{q_k Q_{1,k}}{q_n Q_{1,n}} \quad \text{and} \quad \frac{\omega_n^{**} - c}{\omega_k^{**} - c} = \frac{q_k Q_{1,k}(\beta_k + (1-\beta_k)\mathcal{I}_k)}{q_n Q_{1,n}(\beta_n + (1-\beta_n)\mathcal{I}_n)}. \tag{F.12}$$

First, we show that

$$\frac{\omega_n^* - b - c}{\omega_k^* - b - c} > \frac{\omega_n^{**} - c}{\omega_k^{**} - c}. \tag{F.13}$$

Suppose toward a contradiction that the RHS of (F.13) is at least as large as the LHS of (F.13), then:

$$\frac{\omega_n^{**} - c - (\omega_n^* - b - c)}{\omega_k^{**} - c - (\omega_k^* - b - c)} \geq \frac{\omega_n^* - b - c}{\omega_k^* - b - c}. \tag{F.14}$$

The RHS of (F.14) is strictly greater than 1 since $0 > \omega_k^* > \omega_n^*$ when L is large enough. The LHS of (F.14) being greater than 1 is equivalent to

$$b - (\omega_n^* - \omega_n^{**}) > b - (\omega_k^* - \omega_k^{**})$$

which contradicts the previous conclusion in (F.11). This establishes (F.13). This together with (F.12) imply that

$$\beta_k + (1-\beta_k)\mathcal{I}_k < \beta_n + (1-\beta_n)\mathcal{I}_n.$$

Plugging in the expressions of $\mathcal{I}_n$ and $\mathcal{I}_k$ in (F.5), we have:

$$\mathcal{I}_k\big(k + (k-1)l^*\big)\big(n\mathcal{I}_n + (n-1)l^*\big) < \mathcal{I}_n\big(n + (n-1)l^*\big)\big(k\mathcal{I}_k + (k-1)l^*\big).$$

Let $\Delta \equiv \mathcal{I}_k - \mathcal{I}_n$, the above inequality reduces to:

$$(k-n)\mathcal{I}_n(\mathcal{I}_k - 1) = (k-n)\mathcal{I}_n(\mathcal{I}_n + \Delta - 1) < k\Delta - \Big(l^*(k-1)(n-1) + nk\Big)\Delta.$$

Suppose toward a contradiction that $\Delta \geq 0$. Then, the LHS is strictly positive since $\mathcal{I}_k > 1$ and $k > n$. The RHS is negative since $l^*(k-1)(n-1) + nk > k$. This leads to the desired contradiction, and implies that $\Delta < 0$ and, hence, $\mathcal{I}_n > \mathcal{I}_k$.

F.2 Proof of Proposition 6: Limiting Properties

First, we show that $\omega_n^* - \omega_n^{**} \in (0, b)$. Suppose toward a contradiction that $\omega_n^* - \omega_n^{**} \leq 0$, then the comparison between (F.3) and (F.4) suggests that $Q_{1,n} \geq Q_{0,n}$. Plugging this into (F.1) and (F.2), it implies that $\omega_n^* \geq \omega_n^{**} + b$. Since $\omega_n^* - \omega_n^{**} > 0$, we also know that $Q_{1,n} < Q_{0,n}$. The expressions for the cutoffs the imply that $\omega_n^* - \omega_n^{**} < b$. This leads to a contradiction.

Next, we show that $\mathcal{I}_n \to 1$ as $\omega_n^* \to -\infty$. To see this, apply the expressions of ω_n^* and ω_n^{**} in (F.1) and (F.2), we have:

$$\frac{|\omega_n^* - b - c|}{|\omega_n^{**} - c|} = \frac{Q_{0,n}}{Q_{1,n}} = \frac{(n-1)l^*}{(n-1)l^* + n\mathcal{I}_n}\mathcal{I}_n + \frac{n\mathcal{I}_n}{(n-1)l^* + n\mathcal{I}_n}. \tag{F.15}$$

Since $\omega_n^* - \omega_n^{**} \in (0, b)$, the LHS converges to 1 as $\omega_n^* \to -\infty$, which implies that the RHS also converges to 1. This can occur only if $\mathcal{I}_n \to 1$.

In the last step, we show that $\omega_n^* \to -\infty$ as $L \to \infty$. Suppose toward a contradiction that there exists a finite accumulation point $\omega^* \in \mathbb{R}_-$ for ω_n^*. Then, as the LHS of (F.6) converges to 0 when $L \to \infty$, along the sequence in which $\omega_n^* \to \omega^*$, either $q_n \to 0$ in some subsequence, or $\Phi(\omega_n^*) - \Phi(\omega_n^{**}) \to 0$ in some subsequence, or both. Since $\omega_n^* \to \omega^*$, $\Phi(\omega_n^*) - \Phi(\omega_n^{**}) \to 0$ implies that $\omega_n^* - \omega_n^{**} \to 0$.

First, suppose toward a contradiction that $q_n \to 0$ along some subsequence. From (F.1), $\omega_n^* \to -\infty$ along this subsequence, which leads to a contradiction.

Second, suppose toward a contradiction that q_n is bounded away from 0 along some subsequence, i.e strictly greater than some $\underline{q} > 0$, then, in order for the LHS of (F.6) to converge to 0, we need $\omega_n^* - \omega_n^{**} \to 0$ along this subsequence. Subtracting the expression of ω_n^* from that of ω_n^{**}, we obtain:

$$\frac{q_n}{c}\Big(\omega_n^* - (\omega_n^{**} + b)\Big) = \frac{(n-1)l^*}{(n-1)l^* + n}\Big\{\frac{1}{\delta\Phi(\omega_n^*) + (1-\delta)\alpha} - \frac{1}{\delta\Phi(\omega_n^{**}) + (1-\delta)\alpha}\Big\}. \tag{F.16}$$

The absolute value of the LHS is no less than $\underline{q}b/c$ in the limit as $\omega_n^* - \omega_n^{**} \to 0$. The absolute value of the RHS converges to 0 as $\Phi(\omega_n^*) - \Phi(\omega_n^{**}) \to 0$, leading to a contradiction. This suggests that $\omega_n^* \to -\infty$ in every equilibrium as $L \to \infty$.

The three parts together imply that as $L \to \infty$, ω_n^* and ω_n^{**} go to $-\infty$, the aggregate informativeness of reports, $\mathcal{I}_n$, converges to 1 and the equilibrium probability of crime π_n converges to π^*.

F.3 Proof of Proposition 6: Conviction Probabilities

In this subsection, we show the following result.

Proposition F.1. *For every $n \in \mathbb{N}$, there exists $\overline{L}_n$ such that when $L > \overline{L}_n$, $q(\boldsymbol{a}) = 0$ for all $\boldsymbol{a} \neq (1, 1, ..., 1)$ in every equilibrium that is symmetric and satisfies the presumption of innocence axiom.*

Proof of Proposition F.1: Suppose toward a contradiction that for every $L' \in \mathbb{R}_+$, there exists $L \geq L'$ such that when the magnitude of punishment is L, there exists a symmetric equilibrium that satisfies presumption of innocence such that $q(1, 1, ..., 1) = 1$. We establish a lower bound on the marginal increase in conviction probabilities that uniformly applies across all L.

According to Lemma 3.2 in the main text, for every $\boldsymbol{a} \succ \boldsymbol{a'}$, we have

$$\Pr(\overline{\theta} = 1|\boldsymbol{a}) > \Pr(\overline{\theta} = 1|\boldsymbol{a'}).$$

As a result, there exist $m \in \{1, 2, ..., n\}$ and $q \in [0, 1)$ such that the principal is convicted for sure when there are m reports or more, and is convicted with probability q when there are $m - 1$ reports. The presumption of innocence axiom requires that whenever $m = 1$, we have $q = 0$.

An agent equilibrium strategy is summarized by two cutoffs, ω^* and ω^{**}, such that for every i, agent i reports either when $\theta_i = 1$ and $\omega_i \leq \omega^*$, or when $\theta_i = 0$ and $\omega_i \leq \omega^{**}$. Let $\Psi^* \equiv (1 - \delta)\alpha + \delta\Phi(\omega^*)$ and $\Psi^{**} \equiv (1 - \delta)\alpha + \delta\Phi(\omega^{**})$.

For every $m \leq n - 1$, let $Q(m, \theta_{-i})$ be the probability with which agents other than i submit m reports. Fixing θ_{-i}, by changing θ_i from 1 to 0, the marginal increase in conviction probability is given by

$$(\Psi^* - \Psi^{**})P(m, q, \theta_{-i}), \tag{F.17}$$

where

$$P(m, q, \theta_{-i}) \equiv qQ(m - 2, \theta_{-i}) + \sum_{j=m-1}^{n-1} Q(j, \theta_{-i}) - qQ(m - 1, \theta_{-i}) - \sum_{j=m}^{n-1} Q(j, \theta_{-i}). \tag{F.18}$$

This yields

$$P(m, q, \theta_{-i}) = (1 - q)Q(m - 1, \theta_{-i}) + qQ(m - 2, \theta_{-i}). \tag{F.19}$$

Since the value of θ is binary and the equilibrium is symmetric, the functions $Q(m, \theta_{-i})$ and $P(m, q, \theta_{-i})$ depend on θ_{-i} only through the number of 1s in the entries of θ_{-i}. Let $|\theta_{-i}|$ be the number of 1s in the entries of the vector θ_{-i}. Abusing notation, we rewrite $Q(m, \theta_{-i})$ as $Q(m, |\theta_{-i}|)$, and $P(m, q, \theta_{-i})$ as $P(m, q, |\theta_{-i}|)$. Fixing m and q, we have one of the following three situations:

1. either $P(m, q, |\theta_{-i}|)$ is strictly increasing in $|\theta_{-i}|$,

2. or $P(m, q, |\theta_{-i}|)$ is strictly decreasing in $|\theta_{-i}|$,

3. or $P(m, q, |\theta_{-i}|)$ is first increasing and then decreasing in $|\theta_{-i}|$.

In equilibrium, the principal is indifferent between committing crime against k agents and not committing any crime, in which

$$k \in \arg\min_{\widetilde{k} \in \{1,...,n\}} \frac{1}{\widetilde{k}} \sum_{j=0}^{\widetilde{k}-1} P(m, q, |\theta_{-i}|). \tag{F.20}$$

This is because the probability with which the principal commits crime is interior (Lemma 3.1 in the main text), so (1) not committing any crime must be one of the principal's optimal actions; (2) he is indifferent between not committing any crime and committing k crimes for some $k \in \{1, 2, ..., n\}$. Therefore, (1) the average cost of committing a crime when he commits k crimes equals 1, and (2) there cannot exist any $k' \in \{1, 2, ..., n\}$ such that if the principal commits k' crimes, his average cost of committing a crime is strictly less than 1.

In this way, we can pin down the support of the principal's equilibrium strategy. In the first situation, we have $k = 1$, namely, the principal is indifferent between committing only one crime and committing no crime. In the second situation, we have $k = n$, namely, the principal is indifferent between committing no crime and committing crime against all agents. In the third situation, k is either 1 or n, depending on the parameters. In what follows, we consider the two values of k separately.

Strategic Substitutes: When $k = 1$, an agent's reporting cutoff when he has witnessed crime is:

$$\omega^* = b - c \frac{\left\{1 - qQ(m-2, 0) - \sum_{j=m-1}^{n-1} Q(j, 0)\right\}}{P(m, q, 0)} \tag{F.21}$$

Similarly, an agent's reporting cutoff when he has not witnessed any crime is:

$$\omega^{**} = -c \frac{1 - \beta\left\{qQ(m-2, 0) + \sum_{j=m-1}^{n-1} Q(j, 0)\right\} - (1-\beta)\left\{qQ(m-2, 1) + \sum_{j=m-1}^{n-1} Q(j, 1)\right\}}{\beta P(m, q, 0) + (1-\beta) P(m, q, 1)} \tag{F.22}$$

where β is the probability with which $\theta_1 = ... = \theta_n = 0$ conditional on $\theta_i = 0$. The rest of this part consists of three steps.

In the first step, we show that $\omega^* < \omega^{**} + b$. This comes from the fact that $k = 1$, which implies that

$P(m,q,1) > P(m,q,0)$. Moreover,

$$qQ(m-2,1) + \sum_{j=m-1}^{n-1} Q(j,1) > qQ(m-2,0) + \sum_{j=m-1}^{n-1} Q(j,0).$$

Therefore,

$$\frac{\omega^* - (\omega^{**} + b)}{c} = \frac{1 - \beta\Big\{qQ(m-2,0) + \sum_{j=m-1}^{n-1} Q(j,0)\Big\} - (1-\beta)\Big\{qQ(m-2,1) + \sum_{j=m-1}^{n-1} Q(j,1)\Big\}}{\beta P(m,q,0) + (1-\beta)P(m,q,1)}$$

$$- \frac{\Big\{1 - qQ(m-2,0) - \sum_{j=m-1}^{n-1} Q(j,0)\Big\}}{P(m,q,0)} < 0.$$

In the second step, we bound ω^* from below using the facts that $|\omega^* - \omega^{**}| < b$ and $q(1,1,...,1) = 1$. First, for every $m \in \{0,1,...,n-1\}$ and q,

$$P(m,q,0) \geq P(n-1,0,0) = (\Psi^{**})^{n-1}.$$

From (F.21), we know that

$$\frac{\omega^* - b}{c} \geq -(\Psi^{**})^{-(n-1)} \geq -\Big(\delta\Phi(\omega^* - b) + (1-\delta)\alpha\Big)^{-(n-1)}.$$

Since the RHS of the above inequality is bounded from below, we know that there exists $\underline{\omega}^* \in \mathbb{R}_-$, independent of L, such that $\omega^* \geq \underline{\omega}^*$.

In the third step, we bound the value of $\Psi^* - \Psi^{**}$ from below. Let

$$X_0 \equiv qQ(m-2,0) + \sum_{j=m-1}^{n-1} Q(j,0),$$

and let

$$X_1 \equiv qQ(m-2,1) + \sum_{j=m-1}^{n-1} Q(j,1).$$

From (F.21) and (F.22),

$$\frac{\omega^* - \omega^{**}}{c} = \frac{b}{c} - (1-\beta)\frac{P(m,q,1)(1-X_0) - P(m,q,0)(1-X_1)}{P(m,q,0)\big(\beta P(m,q,0) + (1-\beta)P(m,q,1)\big)}. \tag{F.23}$$

We start by bounding

$$\frac{P(m,q,1)(1-X_0)-P(m,q,0)(1-X_1)}{\Psi^*-\Psi^{**}} \tag{F.24}$$

from above. Since

$$P(m,q,1)(1-X_0)-P(m,q,0)(1-X_1)=(X_1-X_0)P(m,q,0)+(1-X_0)(P(m,q,1)-P(m,q,0)),$$

and $1-X_0$ as well as $P(m,q,0)$ are bounded from above by 1, we only need to bound the following two terms from above:

$$\frac{X_1-X_0}{\Psi^*-\Psi^{**}} \quad \text{and} \quad \frac{P(m,q,1)-P(m,q,0)}{\Psi^*-\Psi^{**}}.$$

Notice that

$$\frac{Q(j,1)-Q(j,0)}{\Psi^*-\Psi^{**}}=\binom{n-2}{j-1}(\Psi^{**})^{j-1}(1-\Psi^{**})^{n-1-j}-\binom{n-2}{j}(\Psi^{**})^{j}(1-\Psi^{**})^{n-2-j}$$

which is bounded from above by $\binom{n-2}{j-1}$. Since X_1-X_0 and $P(m,q,1)-P(m,q,0)$ are both linear combinations of terms in the form of $Q(j,1)-Q(j,0)$, we know that

$$\frac{X_1-X_0}{\Psi^*-\Psi^{**}} \quad \text{and} \quad \frac{P(m,q,1)-P(m,q,0)}{\Psi^*-\Psi^{**}}.$$

are also bounded from above. Let $C_0\in\mathbb{R}_+$ be the upper bound on (F.24). Since

$$P(m,q,0)\big(\beta P(m,q,0)+(1-\beta)P(m,q,1)\big)$$

is bounded away from 0, we can also bound

$$\frac{1}{\Psi^*-\Psi^{**}}\cdot\frac{P(m,q,1)(1-X_0)-P(m,q,0)(1-X_1)}{P(m,q,0)\big(\beta P(m,q,0)+(1-\beta)P(m,q,1)\big)}. \tag{F.25}$$

Letting $C_1\in\mathbb{R}_+$ denote this bound, we have

$$\frac{\omega^*-\omega^{**}}{c}\geq\frac{b}{c}-\delta(1-\beta)C_1(\Phi(\omega^*)-\Phi(\omega^{**})). \tag{F.26}$$

Letting $C_2\equiv\delta(1-\beta)C_1$, we obtain

$$\frac{\omega^*-\omega^{**}}{c}+C_2(\Phi(\omega^*)-\Phi(\omega^{**}))\geq\frac{b}{c}. \tag{F.27}$$

Given that we have shown $\omega^* > \underline{\omega}^*$ in the previous step, let $\epsilon \in \mathbb{R}_+$ be pinned down by:

$$\frac{\epsilon}{c} + C_2 \epsilon \phi(\underline{\omega}^* - \epsilon) = \frac{b}{c}.$$

The above equation admits a solution since the LHS is continuous, strictly increasing in ϵ, and moreover, the value of the LHS is strictly greater than $\frac{b}{c}$ when $\epsilon \to \infty$, and is strictly less than $\frac{b}{c}$ when $\epsilon \to -\infty$. Inequality (F.27) implies that $\omega^* = \omega^{**} \geq \epsilon$, and therefore,

$$\Psi^* - \Psi^{**} = \delta(\Phi(\omega^*) - \Phi(\omega^{**})) \geq \delta \epsilon \phi(\underline{\omega}^* - \epsilon). \tag{F.28}$$

Back to the principal's incentive constraint that:

$$P(m, q, 0)(\Psi^* - \Psi^{**})L = 1.$$

Since $P(m, q, 0)$ is bounded from below by

$$\Big(\delta \Phi(\underline{\omega}^* - b) + (1 - \delta)\alpha\Big)^{-(n-1)}$$

and $\Psi^* - \Psi^{**}$ is bounded from below by (F.28), we know that as $L \to \infty$, the LHS goes to infinity, which leads to a contradiction.

Strategic Complements: When $k = n$, an agent's reporting cutoff when he has witnessed a crime is:

$$\omega^* = b - c \frac{\Big\{1 - qQ(m-2, n-1) - \sum_{j=m-1}^{n-1} Q(j, n-1)\Big\}}{P(m, q, n-1)} \tag{F.29}$$

Similarly, an agent's reporting cutoff when he has not witnessed any crime is:

$$\omega^{**} = -c \frac{\Big\{1 - qQ(m-2, 0) - \sum_{j=m-1}^{n-1} Q(j, 0)\Big\}}{P(m, q, 0)} \tag{F.30}$$

Since $k = n$, we know that

$$P(m, q, n-1) > P(m, q, 0) \tag{F.31}$$

and moreover, since $\Psi^* - \Psi^{**} > 0$, we know that

$$qQ(m-2, n-1) - \sum_{j=m-1}^{n-1} Q(j, n-1) > qQ(m-2, 0) - \sum_{j=m-1}^{n-1} Q(j, 0). \tag{F.32}$$

The above two inequalities imply that the distance between the cutoffs is strictly greater than b. To bound ω^* from below, notice that

$$\frac{\omega^*}{c} \geq -\Big((1-\delta)\alpha\Big)^{-(n-1)}. \tag{F.33}$$

Denoting the lower bound of ω^* by $\underline{\omega}^*$, the principal's marginal cost of committing an additional crime is bounded from below by

$$L(\Psi^* - \Psi^{**})P(m, q, n-1) \geq L\delta b\phi(\underline{\omega}^* - b)(1-\delta)^{n-1}\alpha^{n-1}. \tag{F.34}$$

The RHS goes to infinity as $L \to \infty$, leading to a contradiction. $\square$

G Proof of Proposition 8

In this section, we show Proposition 8 in the main text and derive some additional properties of the equilibrium when there is a significant probability of a virtuous type. The proof of the proposition's first statement follows from Online Appendix C.2.

For statement 2, suppose toward a contradiction that the probability of crime is strictly below $1 - \pi^v$. Since $\pi^v > 1 - \pi^*$, we know that the probability of crime is strictly less than π^*. Therefore,

$$\mathcal{I} \equiv \frac{\Pr(a_1 = a_2 = 1 | \overline{\theta} = 1)}{\Pr(a_1 = a_2 = 1 | \overline{\theta} = 0)} \geq \frac{1-\pi^v}{\pi^v} \Big/ \frac{\pi^*}{1-\pi^*} > 1. \tag{G.1}$$

Given the conviction probabilities in statement 1, the principal's marginal cost of committing crime is increasing in the number of other committed crimes. Therefore, if the probability of crime is strictly less than π^*, it is optimal for the opportunistic principal to commit no crime, and he is indifferent between this and committing only one crime. As a result, the derivation in section 3.4 of the main text still applies. According to Theorem 2, for every $\epsilon > 0$ there exists $\overline{L}_\epsilon > 0$ such that when $L \geq L_\epsilon$, the informativeness ratio $\mathcal{I} < 1 + \epsilon$. This contradicts (G.1), which implies that the equilibrium probability of crime is $1 - \pi^v$.

For statement 3, suppose toward a contradiction that the opportunistic principal only commits one crime and let $\pi_m = \frac{1-\pi^v}{2}$. Repeating the derivation of section 3.4 until Lemma 3.4, we know that if $\omega_m^* \to -\infty$, then $\mathcal{I} \to 1$. Since the probability of crime $1 - \pi^v$ is less than π^*, in equilibrium $\mathcal{I}$ is bounded below away from 1. However, since the principal has a weak incentive to commit one crime, we know that

$$\frac{1}{L} \geq q\Psi^{**}(\Psi^{*} - \Psi^{**}), \tag{G.2}$$

where $\Psi^{*} \equiv \delta\Phi(\omega_m^{*}) + (1-\delta)\alpha$ and $\Psi^{**} \equiv \delta\Phi(\omega_m^{**}) + (1-\delta)\alpha$. Using the same argument as in the proof of Theorem 2, we can show that (G.2) implies that $\omega_m^{**} \to -\infty$. This contradicts the requirement that $\mathcal{I}$ is bounded below away from 1.

For statement 4, let β^{*} and β^{**} denote an agent's belief that the other agent has witnessed crime conditional on $\theta_i = 1$ and $\theta_i = 0$, respectively. The reporting cutoffs in a symmetric equilibrium are

$$\omega^{*} = b + c - \frac{c}{q(\beta^{*}\Psi^{*} + (1-\beta^{*})\Psi^{**})} \tag{G.3}$$

and

$$\omega^{**} = c - \frac{c}{q(\beta^{**}\Psi^{*} + (1-\beta^{**})\Psi^{**})}. \tag{G.4}$$

Therefore,

$$\frac{|\omega_m^{*} - b - c|}{|\omega_m^{**} - c|} = \frac{\beta^{**}R + (1-\beta^{**})}{\beta^{*}R + (1-\beta^{*})}, \tag{G.5}$$

where $R \equiv \Psi^{*}/\Psi^{**}$. The informativeness of reports $\mathcal{I}$ is bounded below by R (perfectly negative correlation) and bounded above by R^2 (perfectly positive correlation). Since in equilibrium the informativeness $\mathcal{I}$ is strictly greater than 1 and finite, the likelihood ratio R, which lies between $\sqrt{\mathcal{I}}$ and $\mathcal{I}$, is also strictly greater than 1 and finite.

When L is large enough, we first show that $q \to 0$. Suppose not. Then, ω_m^{*} and ω_m^{**} converge to interior limits, whose distance is bounded below away from 0. This implies that the marginal cost of committing one crime strictly exceeds 1 when L is large enough, which leads to a contradiction.

Since $q \to 0$, both ω^{*} and ω^{**} are diverging to $-\infty$. Given that the likelihood ratio R is bounded, the distance between ω^{*} and ω^{**} for any large enough L is strictly less than b. Therefore, $\beta^{*} < \beta^{**}$, which means that an agent who has witnessed crime attaches a strictly lower probability to the other agent having witnessed crime than an agent who has not witnessed any crime.

In what follows, we study the limit of equilibria when $L \to +\infty$. Let π_1 be the probability of $(\theta_1, \theta_2) = (1, 0)$ or $(\theta_1, \theta_2) = (0, 1)$ and $\pi \equiv 1 - \pi^{v}$. The probability of $(\theta_1, \theta_2) = (1, 1)$ is $\pi - 2\pi_1$. The informativeness ratio $\mathcal{I}$, which is determined by π^{*} and π, can also be written as

$$\mathcal{I} = \frac{1}{\pi}\Big\{(\pi - 2\pi_1)R^2 + 2\pi_1 R\Big\} \tag{G.6}$$

This provides a joint condition on R and π_1. Combining our earlier observations, the following ratio converges to 1 as $L \to +\infty$:

$$\frac{|\omega^* - b - c|}{|\omega^{**} - c|} = \frac{(\pi_1 R + 1 - \pi_1)(\pi - \pi_1)}{((\pi - 2\pi_1)R + \pi_1)(1 - \pi + \pi_1)}.$$

Since the RHS is equal to 1, either $R = 1$ or

$$\pi_1 = \sqrt{1-\pi} - (1 - \pi). \tag{G.7}$$

Since $\mathcal{I} > 1$, $R > 1$. Therefore, the probability with which $(\theta_1, \theta_2) = (1, 0)$ needs to satisfy (G.7). This yields

$$\beta^* = \beta^{**} = 1 - \sqrt{1-\pi}. \tag{G.8}$$

This determines the probability that two crimes are committed in equilibrium when L is large enough.

Remark: Intuitively, as $L \to +\infty$, the difference in the conditional distribution vanishes, the informativeness ratio converges to a constant that is strictly above 1, and the distance between the reporting cutoffs $|\omega^* - \omega^{**}|$ also vanishes. To understand why these conclusions do not contradict one another, let us go back to the expressions of ω^* and ω^{**}:

$$\omega^* = b + c - \frac{c}{q(\beta^* \Phi^* + (1 - \beta^*)\Phi^{**})} \tag{G.9}$$

and

$$\omega^{**} = c - \frac{c}{q(\beta^{**} \Phi^* + (1 - \beta^{**})\Phi^{**})}. \tag{G.10}$$

As $L \to +\infty$, Φ^* and Φ^{**} become smaller. Therefore, a small difference between β^* and β^{**} leads to a large difference in $\frac{c}{q(\beta^* \Phi^* + (1-\beta^*)\Phi^{**})}$ and $\frac{c}{q(\beta^{**} \Phi^* + (1-\beta^{**})\Phi^{**})}$.

H Extensions

We study two sets of extensions. In subsection H.1, we examine the robustness of our insights to alternative specifications of the agents' payoffs. In subsection H.2, we show that our results are insensitive to specific strategies of the mechanical types.

H.1 Alternative Specifications of Agents' Payoffs

Social Preferences: The variable $\overline{\theta} \equiv \max\{\theta_1, \theta_2, ..., \theta_n\}$ describes whether the principal is guilty of any crime or innocent. Suppose that agent i's payoff is 0 when the principal is convicted and is

$$\omega_i - b\Big((1-\gamma)\theta_i + \gamma\overline{\theta}\Big) - ca_i \tag{H.1}$$

when the principal is acquitted. Intuitively, an agent's payoff depends not only on whether the principal has committed a crime against him or not, but also on whether the principal is guilty or innocent, in which $\gamma \in [0,1]$ measures the intensity of his social preferences. Our new formulation coincides with the baseline model when $\gamma = 0$.

In this setting, since agent 1 does not observe θ_2 and agent 2 does not observe θ_1, the agents decide whether to accuse the principal based on their beliefs about $\overline{\theta}$ after observing their own θ_i. As a result, an agent's strategy in any given equilibrium is still characterized by two cutoffs: ω^* when $\theta_i = 1$ and ω^{**} when $\theta_i = 0$. Whether the principal's incentives to commit crimes are strategic complements or substitutes is still determined by the sign of (C.7). When L is large, we need two reports to convict the principal with positive probability and the principal's decisions to commit crimes are strategic substitutes. This results in negative correlation between the agents' private information.

In contrast to the baseline model, the expressions for an agent's reporting cutoffs are given by

$$\omega^* = b + c - \frac{c}{q_m \Psi^{**}} \tag{H.2}$$

and

$$\omega^{**} = c + \frac{b\Psi^*(1-\beta)\gamma}{\beta\Psi^{**} + (1-\beta)\Psi^*} - \frac{c}{q_m\Big(\beta\Psi^{**} + (1-\beta)\Psi^*\Big)} \tag{H.3}$$

where $q_m \in (0,1)$ is the probability of conviction when there are two reports, $\Psi^* \equiv \delta\Phi(\omega^*) + (1-\delta)\alpha$, $\Psi^{**} \equiv \delta\Phi(\omega^{**}) + (1-\delta)\alpha$ and β is the probability of $\theta_j = 0$ conditional on $\theta_i = 0$. Comparing (H.3) to the expression for ω_m^{**} in the baseline model, the novel term is

$$\frac{b\Psi^*(1-\beta)\gamma}{\beta\Psi^{**} + (1-\beta)\Psi^*}, \tag{H.4}$$

which measures the impact of social preferences on an agent's equilibrium reporting strategy. This term is equal to 0 when $\gamma = 0$. Moreover,

$$0 \leq \frac{b\Psi^*(1-\beta)\gamma}{\beta\Psi^{**} + (1-\beta)\Psi^*} \leq \gamma b. \tag{H.5}$$

Using the same logic as in Lemma 3.2 of the main text, we can show that $\omega^* - \omega^{**} \in [0, b]$. According to (H.2) and (H.3), we have

$$\frac{|\omega^* - c - b|}{\left|\omega^{**} - c - \dfrac{b\Psi^*(1-\beta)\gamma}{\beta\Psi^{**} + (1-\beta)\Psi^*}\right|} = \frac{\beta\Psi^{**} + (1-\beta)\Psi^*}{\Psi^{**}} = \beta + (1-\beta)\frac{\Psi^*}{\Psi^{**}} = \frac{(l^*+2)\mathcal{I}_m}{l^* + 2\mathcal{I}_m}, \tag{H.6}$$

where $\mathcal{I}_m \equiv \Psi^*/\Psi^{**}$ measures the aggregate informativeness of reports.

As $L \to +\infty$, one can show that both ω^* and ω^{**} go to $-\infty$ using the same argument as in subsection 3.4 of the main text. Since the difference between the denominator and the numerator of the LHS of (H.6) is at most b, the value of (H.6) converges to 1. This implies that $\mathcal{I}_m$ converges to 1, namely, the agents' reports are arbitrarily uninformative and the equilibrium probability of crime approaches π^*.

Ex Post Evidence and Punishment of False Accusers: When an innocent principal is convicted, i.e., $\theta_1 = ... = \theta_n = 0$ and $s = 1$, some ex post evidence arrives with probability p^* that reveals his innocence. When this occurs, every agent who has filed a false accusation is penalized by some amount l. Our earlier analysis goes through and our qualitative results remain robust as the presence of ex post evidence is equivalent to an increase in b. To see this, agent i's indifference condition when $\theta_i = 0$ is now given by

$$q_m Q_0 \omega_i = -c(1 - q_m Q_0) - q_m Q_0 p^* l. \tag{H.7}$$

The expression for the cutoff is then given by

$$\omega_m^{**} \equiv -p^* l - c\frac{1 - q_m Q_0}{q_m Q_0} = -p^* l + c - \frac{c}{q_m Q_0}. \tag{H.8}$$

The above expression is qualitatively the same as that in (2.9) of the main text except one needs to replace b with $\widetilde{b} \equiv b + p^* l$.

Intrinsic Motive for Truth Telling: Suppose that each agent receives an extra benefit d, strictly less than c, from accusing the principal whenever he has observed a crime, regardless of whether the principal is punished. Agents' reporting cutoffs are now given by

$$\omega^* = b + c - \frac{c-d}{q\Psi^{**}}$$

and

$$\omega^{**} = c - \frac{c}{q(\beta\Psi^{**} + (1-\beta)\Psi^*)}.$$

where $q \in (0,1)$ is the probability of conviction conditional on both agents accusing the principal, and β is the belief of an agent who has not witnessed any crime about the probability with which the other agent has not witnessed any crime. Let π be the equilibrium probability of crime, we have

$$\beta = \frac{1-\pi}{1-\pi/2}$$

Let $l^* \equiv \pi^*/(1-\pi^*)$. The informativeness of reports

$$\mathcal{I} \equiv \Psi^*/\Psi^{**}$$

yields the following expression for β and $1-\beta$:

$$\beta = \frac{2\mathcal{I}}{l^* + 2\mathcal{I}} \text{ and } 1-\beta = \frac{l^*}{l^* + 2\mathcal{I}}.$$

The principal's incentive constraint is given by

$$\frac{1}{L} = q\Psi^{**}(\Psi^* - \Psi^{**}).$$

Therefore, as $L \to +\infty$, both ω^* and ω^{**} go to $-\infty$.

The expressions for the reporting cutoffs yield

$$\frac{c+b-\omega^*}{c-d} = \frac{1}{q\Psi^{**}},$$

and

$$\frac{c-\omega^{**}}{c} = \frac{1}{q(\beta\Psi^{**} + (1-\beta)\Psi^*)}.$$

Therefore, we have

$$\frac{(c+b-\omega^*)/(c-d)}{(c-\omega^{**})/c} = \frac{(l^*+2)\mathcal{I}}{l^* + 2\mathcal{I}}.$$

In what follows, we show that as $L \to +\infty$, the LHS of the above equation is bounded between 1 and $\frac{c}{c-d}$. The lower bound 1 is straightforward to derive. To derive the upper bound $\frac{c}{c-d}$, notice that since $\omega^* > \omega^{**}$ and $\Psi^* > \Psi^{**}$, we have

$$\frac{c+b-\omega^*}{c-d} > \frac{c-\omega^{**}}{c} > \frac{c-\omega^*}{c}.$$

We consider two cases. First, when $\omega^* > \omega^{**} + b$, we have

$$\frac{c+b-\omega^*}{c-\omega^{**}} < \frac{c-\omega^{**}}{c-\omega^{**}} = 1,$$

which is equivalent to

$$\frac{(c+b-\omega^*)/(c-d)}{(c-\omega^{**})/c} < \frac{c}{c-d}.$$

Second, when $\omega^* \leq \omega^{**} + b$, as ω^* and ω^{**} go to infinity,

$$\frac{c+b-\omega^*}{c-\omega^{**}} \to 1,$$

which implies that

$$\frac{(c+b-\omega^*)/(c-d)}{(c-\omega^{**})/c} \to \frac{c}{c-d}.$$

As a result, we know that in the $L \to +\infty$ limit,

$$1 \leq \frac{(l^*+2)\mathcal{I}}{l^*+2\mathcal{I}} \leq \frac{c}{c-d}$$

which derives an upper bound on the informativeness ratio $\mathcal{I}$. Such an upper bound is nontrivial if and only if

$$\frac{2+l^*}{2} > \frac{c}{c-d},$$

in another word, d is small enough.

H.2 Alternative Mechanical Types

We examine the robustness of our findings against alternative specifications of the mechanical types' strategies. We allow the mechanical types' reports to be informative about the principal's innocence and show that when mechanical types are rare and the principal's loss from being convicted is sufficiently large, the informativeness of reports vanishes to 1 and the probability of crime converges to π^*, as in the baseline model. We focus on the comparison between the single-agent benchmark and the two-agent scenario.

H.2.1 Model and Result

Consider the following modification of the baseline model. With probability $\delta \in (0,1)$, the agent is a strategic type maximizes payoff function given by (2.4) in the main text. With probability $1-\delta$, the agent is a mechanical type whose reporting cutoff is $\overline{\omega}$ when $\theta_i = 1$ and $\underline{\omega}$ when $\theta_i = 0$. We assume that both $\overline{\omega}$ and $\underline{\omega}$ are finite with $\overline{\omega} \geq \underline{\omega}$, that is, the mechanical type's report can be informative about θ.[4]

When there is only one agent, the agent's reporting cutoffs ω_s^* and ω_s^{**} are given by (3.1) and (3.2), respectively. The probability that the principal is convicted following one accusation is q_s, where the tuple $(q_s, \omega_s^*, \omega_s^{**})$ satisfies

$$q_s\Big(\delta(\Phi(\omega_s^*) - \Phi(\omega_s^{**})) + (1-\delta)(\Phi(\overline{\omega}) - \Phi(\underline{\omega}))\Big) = 1/L. \tag{H.9}$$

One can show that when $\delta \to 1$ and L is larger than some cutoff $L(\delta)$, the informativeness of the agent's report

$$\mathcal{I}_s \equiv \frac{\delta\Phi(\omega_s^*) + (1-\delta)\Phi(\overline{\omega})}{\delta\Phi(\omega_s^{**}) + (1-\delta)\Phi(\underline{\omega})}$$

diverges to $+\infty$. That is, the agent's report becomes arbitrarily informative in the limit.

In the two-agent case, for every $i \in \{1,2\}$, agent i's probability of filing a report is $\Psi^* \equiv \delta\Phi(\omega_m^*) + (1-\delta)\Phi(\overline{\omega})$ conditional on $\theta_i = 1$; his probability of filing a report is $\Psi^{**} \equiv \delta\Phi(\omega_m^{**}) + (1-\delta)\Phi(\underline{\omega})$ conditional on $\theta_i = 0$. The strategic agent's reporting cutoffs are given by

$$\omega_m^* \equiv b + c - \frac{c}{q_m\Psi^{**}} \quad \text{and} \quad \omega_m^{**} \equiv c - \frac{c}{q_m\Big(\beta\Psi^{**} + (1-\beta)\Psi^*\Big)}. \tag{H.10}$$

Let $\mathcal{I}_m \equiv \Psi^*/\Psi^{**}$. When L is large enough, the conviction probabilities in every equilibrium must satisfy $q(0,0) = q(0,1) = q(1,0) = 0$ and $q(1,1) \in (0,1)$. Therefore, the expressions for β and $1-\beta$ remain the same as in (3.15). The distance between the two cutoffs is given by

$$\omega_m^* - \omega_m^{**} = b - \frac{c}{q_m}\frac{(1-\beta)(\mathcal{I}_m - 1)}{\Psi^{**}(\beta + (1-\beta)\mathcal{I}_m)} = b - \frac{c}{q_m\Psi^{**}}\frac{l^*}{2+l^*}\frac{\mathcal{I}_m - 1}{\mathcal{I}_m}. \tag{H.11}$$

[4] Our analysis also applies when mechanical types are using arbitrary strategies contingent on (θ_i, ω_i), as long as conditional on each realization of θ_i, the probability with which the mechanical type reports is interior, and moreover, this conditional probability is weakly higher when $\theta_i = 1$ than when $\theta_i = 0$.

This implies $\omega_m^* - \omega_m^{**} < b$, because for $\omega_m^* - \omega_m^{**}$ to weakly exceed b, we need $\mathcal{I}_m \leq 1$, which can only be true when $\omega_m^* \leq \omega_m^{**}$, leading to a contradiction.

In contrast to the baseline model, when mechanical types' reports are informative about the principal's innocence, the strategic types' coordination motives can *reverse* the ordering between the two cutoffs. That is to say, ω_m^* can be strictly smaller than ω_m^{**} in equilibrium. As a result, the argument that shows $\mathcal{I}_m \to 1$ when $\omega_m^* \to -\infty$ in Lemma 3.3 in the main text no longer applies. In principle, ω_m^* could be much smaller than ω_m^{**}, and the ratio between the absolute values in (3.17) could converge to a limit strictly above 1 as ω_m^* and ω_m^{**} diverge to $-\infty$. To circumvent this problem, we take an alternative approach based on the comparison between ω_m^* and ω_s^* to establish the following proposition.

Proposition H.1. *There exists $\overline{L} : \mathbb{R}_+ \times (0,1) \to \mathbb{R}_+$ such that when $L > \overline{L}(c,\delta)$, an equilibrium exists. Compared to the single-agent benchmark, $q_m > q_s$, $\omega_m^* > \omega_s^*$ and $\omega_m^{**} > \omega_s^{**}$.*
Moreover, as $\delta \to 1$ and $L \to +\infty$ with the relative speed of convergence satisfying $L \geq \overline{L}(c,\delta)$, we have $\omega_m^*, \omega_m^{**} \to -\infty$, $\mathcal{I}_m \to 1$ and $\pi_m \to \pi^*$.

The proof, in the next subsection, distinguishes two cases. Intuitively, in the *regular case* where $\omega_m^* \geq \omega_m^{**}$, one can still apply the ratio condition (3.17) to show that as $\omega_m^* \to -\infty$, the LHS converges to 1 which implies that $\mathcal{I}_m \to 1$. In the *irregular case* where $\omega_m^* < \omega_m^{**}$, the distance between $|\omega_m^* - b - c|$ and $|\omega_m^{**} - c|$ can be strictly larger than b and can explode as $\omega_m^* \to -\infty$. However, since $\omega_m^* > \omega_s^*$ and the informativeness in the single-agent benchmark grows without bound as $L \to +\infty$, it places an upper bound on the informativeness of reports in the two-agent scenario. Since informativeness is entirely contributed by the mechanical types in the irregular case, the value of the aforementioned upper bound converges to 1 as $\mathcal{I}_s \to +\infty$. Summing up the two cases together, we know that the agents' reports are arbitrarily uninformative in the limit even when the mechanical types' reports are informative.

H.2.2 Proof of Proposition H.1

We start by establishing the comparisons between the single-agent benchmark and the two-agent scenario when mechanical types' reports can be informative about θ, captured by the two exogenous reporting cutoffs $\overline{\omega}$ and $\underline{\omega}$ with $\overline{\omega} \geq \underline{\omega}$.

Suppose toward a contradiction that $\omega_m^* \leq \omega_s^*$, the expressions for these cutoffs imply

$$q_m\Big(\delta\Phi(\omega_m^{**}) + (1-\delta)\Phi(\underline{\omega})\Big) \leq q_s.$$

Therefore,

$$q_m\Psi^{**}\Big(\delta\Phi(\omega_s^*)+(1-\delta)\Phi(\overline{\omega})-\delta\Phi(\omega_s^{**})-(1-\delta)\Phi(\underline{\omega})\Big)$$

$$\leq q_s\Big(\delta\Phi(\omega_s^*)+(1-\delta)\Phi(\overline{\omega})-\delta\Phi(\omega_s^{**})-(1-\delta)\Phi(\underline{\omega})\Big)=1/L$$

$$=q_m\Psi^{**}\Big(\delta\Phi(\omega_m^*)+(1-\delta)\Phi(\overline{\omega})-\delta\Phi(\omega_m^{**})-(1-\delta)\Phi(\underline{\omega})\Big)$$

or, equivalently,

$$\Phi(\omega_m^*)-\Phi(\omega_m^{**})\geq\Phi(\omega_s^*)-\Phi(\omega_s^{**}). \tag{H.12}$$

Since $\omega_m^*-\omega_m^{**}<b=\omega_s^*-\omega_s^{**}$ and $\omega_m^*<\omega_s^*$, we have

$$\Phi(\omega_m^*)-\Phi(\omega_m^{**})<\Phi(\omega_s^*)-\Phi(\omega_s^{**}). \tag{H.13}$$

which contradicts (H.12). This shows that $\omega_m^*>\omega_s^*$. Since $\omega_m^*-\omega_m^{**}<b=\omega_s^*-\omega_s^{**}$, we know that $\omega_m^{**}>\omega_s^{**}$. Moreover, $\omega_m^*>\omega_s^*$ implies that $q_m\Psi^{**}>q_s$. That is $1\geq\Psi^{**}>q_s/q_m$, which implies that $q_m>q_s$.

Next, we evaluate the informativeness of agents' reports when there are two agents and δ and L are sufficiently large. First, for every $X\in\mathbb{R}_+$, there exists $\overline{\delta}\in(0,1)$ and $L^*:(\overline{\delta},1)\to\mathbb{R}_+$ such that when $\delta>\overline{\delta}$ and $L>L^*(\delta)$, the resulting cutoffs in the single-agent case satisfies

$$\frac{\delta\Phi(\omega_s^*)+(1-\delta)\Phi(\overline{\omega})}{\delta\Phi(\omega_s^*-b)+(1-\delta)\Phi(\underline{\omega})}>X, \tag{H.14}$$

which implies that

$$\delta\Phi(\omega_s^*)>(1-\delta)\Big(X\Phi(\underline{\omega})-\Phi(\overline{\omega})\Big). \tag{H.15}$$

Next, we establish an upper bound on the informativeness of reports in the limit of the two-agent case. Consider a two-agent economy under parameter values (L,c,δ) such that $L\geq\overline{L}(c,\delta)$, i.e., there exist equilibria that satisfy Axioms 1, 2 and 3. In every equilibrium such that $\omega_m^*\geq\omega_m^{**}$, the expressions for ω_m^* and ω_m^{**} imply that

$$\frac{|\omega_m^*-c-b|}{|\omega_m^{**}-c|}=\frac{(l^*+2)\mathcal{I}_m}{l^*+2\mathcal{I}_m}. \tag{H.16}$$

The LHS converges to 1 as $\omega_m^*\to-\infty$ so the RHS also converges to 1, which implies that $\mathcal{I}_m\to 1$.

In equilibria where $\omega_m^*<\omega_m^{**}$, since $\omega_s^*<\omega_m^*$, we have

$$\mathcal{I}_m\leq\frac{\delta\Phi(\omega_m^*)+(1-\delta)\Phi(\overline{\omega})}{\delta\Phi(\omega_m^*)+(1-\delta)\Phi(\underline{\omega})}\underbrace{\leq}_{\text{since }\mathcal{I}_m>1\text{ and }\omega_m^*>\omega_s^*}\frac{\delta\Phi(\omega_s^*)+(1-\delta)\Phi(\overline{\omega})}{\delta\Phi(\omega_s^*)+(1-\delta)\Phi(\underline{\omega})}$$

$$\leq \frac{(1-\delta)\Big(X\Phi(\underline{\omega})-\Phi(\overline{\omega})\Big)+(1-\delta)\Phi(\overline{\omega})}{(1-\delta)\Big(X\Phi(\underline{\omega})-\Phi(\overline{\omega})\Big)+(1-\delta)\Phi(\underline{\omega})}=\frac{X\Phi(\underline{\omega})}{X\Phi(\underline{\omega})-\Phi(\overline{\omega})+\Phi(\underline{\omega})} \tag{H.17}$$

which also converges to 1 as $X \to +\infty$.

To summarize, since $\omega_m^* \to -\infty$ and $X \to +\infty$ as $\delta \to 1$ and $L \to +\infty$, we know that the informativeness ratio $\mathcal{I}_m$ converges to 1 no matter whether $\omega_m^* \geq \omega_m^{**}$ or $\omega_m^* < \omega_m^{**}$.

H.3 Principal's Payoffs

We allow the punishment to the principal to depend on the number of crimes that he is believed to have committed, focusing on the case of two agents. The principal receives a penalty L if $\Pr(\overline{\theta}=1|\boldsymbol{a}) \geq \pi^*$, and receives a penalty $L'(>L)$ if $\Pr(\theta_1=\theta_2=1|\boldsymbol{a}) \geq \pi^{**}$. The evaluator is indifferent between convicting and acquitting the principal at the cutoff beliefs. Under a reporting profile the meets both of these requirements, the principal receives a penalty L'' that is at least $\max\{L, L'\}$.

In every equilibrium that satisfies presumption of innocence, monotonicity and properness, each agent's reporting strategy takes the form of two cutoffs. For $i \in \{1,2\}$, let Ψ_i^* be the probability with which agent i reports when $\theta_i = 1$, and let Ψ_i^{**} be the probability with which agent i reports when $\theta_i = 0$. Our axioms imply that $\Psi_i^* > \Psi_i^{**}$ for $i \in \{1,2\}$. From the principal's perspective, whether his choices of θ_1 and θ_2 are strategic complements or strategic substitutes only depends on the expected penalty under each reporting profile. Let $P: \{0,1\}^2 \to [0,+\infty)$ be the mapping from reporting vectors to expected penalties. The principal's decisions are strategic complements if

$$P(1,1)+P(0,0) < P(1,0)+P(0,1) \tag{H.18}$$

and are strategic substitutes otherwise. We show the following lemma.

Lemma H.1. *For every $\boldsymbol{a}$ and $\boldsymbol{a'}$ such that $\boldsymbol{a} > \boldsymbol{a'}$,*

$$\Pr\Big(\overline{\theta}=1\Big|\boldsymbol{a}\Big) > \Pr\Big(\overline{\theta}=1\Big|\boldsymbol{a'}\Big), \tag{H.19}$$

and

$$\Pr\Big(\theta_1=\theta_2=1\Big|\boldsymbol{a}\Big) > \Pr\Big(\theta_1=\theta_2=1\Big|\boldsymbol{a'}\Big). \tag{H.20}$$

Lemma H.1 implies that if $P(0,1)$ or $P(1,0)$ is strictly positive, then every equilibrium that satisfies Axioms 1, 2 and 3, must also satisfy $P(1,1) \geq L$. This property comes from the fact that under Axiom 3, when L is large enough, every agent has witnessed crime with strictly positive probability. As in the proof of Theorem 1 in Online Appendix C, this leads to a uniform lower bound on the marginal increase in the expected probability of receiving punishment when the principal commits one extra crime.

Proof of Lemma H.1: The second inequality follows from Lemma 3.2. For the first inequality, it suffices to compare the following two ratios:

$$\mathcal{I}_2 \equiv \frac{\Pr(a_1 = a_2 = 1 | \theta_1 = \theta_2 = 1)}{\Pr(a_1 = a_2 = 1 | \sum_{i=1}^{2} \theta_i \leq 1)}$$

and

$$\mathcal{I}_1 \equiv \frac{\Pr(a_1 = 0, a_2 = 1 | \theta_1 = \theta_2 = 1)}{\Pr(\sum_{i=1}^{2} a_i = 1 | \sum_{i=1}^{2} \theta_i \leq 1)}.$$

Let p_0 be the probability that $(\theta_1, \theta_2) = (0,0)$ conditional on $(\theta_1, \theta_2) \neq (1,1)$, p_1 be the probability that $(\theta_1, \theta_2) = (1,0)$ conditional on $(\theta_1, \theta_2) \neq (1,1)$, and p_2 be the probability that $(\theta_1, \theta_2) = (0,1)$ conditional on $(\theta_1, \theta_2) \neq (1,1)$. We have

$$\mathcal{I}_2^{-1} = p_0 \frac{\Psi_1^{**}}{\Psi_1^{*}} \frac{\Psi_2^{**}}{\Psi_2^{*}} + p_1 \frac{\Psi_2^{**}}{\Psi_2^{*}} + p_2 \frac{\Psi_1^{**}}{\Psi_1^{*}},$$

and

$$\mathcal{I}_1^{-1} = p_0 \frac{1 - \Psi_1^{**}}{1 - \Psi_1^{*}} \frac{\Psi_2^{**}}{\Psi_2^{*}} + p_1 \frac{\Psi_2^{**}}{\Psi_2^{*}} + p_2 \frac{1 - \Psi_1^{**}}{1 - \Psi_1^{*}}.$$

Since $\Psi_i^{*} > \Psi_i^{**}$ for every $i \in \{1,2\}$, we have $\mathcal{I}_2^{-1} < \mathcal{I}_1^{-1}$, or, equivalently, $\mathcal{I}_2 < \mathcal{I}_1$. □

I Distribution of Payoff Shocks

We consider in more detail the specification of the distribution of the agents' payoff shock ω_i, from two angles. First, we motivate our model's assumption that the support of ω_i is unbounded from below. Second, we explore the robustness of our results under alternative distributions of ω_i.

Unbounded Support: The assumption that ω_i is unbounded from below is equivalent to the following property: under every conviction rule $q : \{0,1\}^n \to [0,1]$ that is responsive to each agent's report. That is,

(*) for every $i \in \{1, ..., n\}$, there exists $a_{-i} \in \{0,1\}^{n-1}$ such that $q(1, a_{-i}) \neq q(0, a_{-i})$.

each (strategic) victim reports with positive probability regardless of the odds of being retaliated against.

According to Lemma 3.1 of the main text, property (*) emerges in all equilibria that respect the *presumption of innocence* axiom (Axiom 1). When L is large, the conviction probability $q(\cdot)$ is low for all reporting profiles. Therefore, the unbounded support assumption ensures that (strategic) victims report with positive probability in all equilibria that respect the presumption of innocence axiom when L is large enough.

Next, we show that under the alternative assumption that the support of ω_i is bounded from below, all symmetric equilibria of the game violate the presumption of innocence axiom. As noted earlier, these equilibria contradict the key principle that defendants should not be convicted based on the evaluator's prior belief.

Lemma I.1. *If $\omega_i \geq \underline{\omega}$ with probability 1 for some $\underline{\omega} \in \mathbb{R}$, there must exist $\overline{L} \in \mathbb{R}_+$, such that for every $L \geq \overline{L}$, there exists no symmetric equilibrium that respects Axiom 1.*

Proof. We rule out equilibria in which the probability of crime is 0 or interior. First, suppose toward a contradiction that there exists an equilibrium in which the probability of crime is 0. Then, since mechanical agents accuse the principal with interior probability, the posterior probability of crime is 0 under every reporting profile, and the principal is never punished. He thus have a strict incentive to commit crime, which leads to a contradiction. Next, suppose toward a contradiction that there exists an equilibrium in which the probability of crime is interior. For every $L \in \mathbb{R}_+$, there exists $\overline{q}_L$ such that[5]

$$\max_{\boldsymbol{a} \in \{0,1\}^n} q(\boldsymbol{a}) \leq \overline{q}_L. \tag{I.1}$$

Since the principal is indifferent between committing and not committing crime, $\overline{q}_L \to 0$ as $L \to +\infty$. When $\theta_i = 1$, agent i's reporting cutoff is bounded from above by

$$\omega_i^* \leq b + c - \frac{c}{\overline{q}_L}. \tag{I.2}$$

When L is large enough so that the RHS of (I.2) is less than $\underline{\omega}$, agent i reports with probability 0 regardless of θ_i. This implies that the principal has a strict incentive to commit crime, which leads to a contradiction. □

Alternative Distributions: Let Φ be the cdf of ω_i. We introduce two properties of Φ:

Definition 1. *Φ is regular if it admits a continuous density and there exists $\overline{\omega} \in \mathbb{R}$ such that*

1. *the support of Φ contains $(-\infty, \overline{\omega})$;*

2. *the density is strictly increasing when $\omega \leq \overline{\omega}$;*

[5]See Online Appendix F.3 for a formal proof of this claim.

3. $\Phi(\omega+b)/\Phi(\omega)$ is non-increasing in ω for some $b \in \mathbb{R}_+$ when $\omega < \overline{\omega}$.

Φ has thin left tail if there exists $b \in \mathbb{R}_+$ such that

$$\lim_{\omega \to -\infty} \Phi(\omega+b)/\Phi(\omega) = +\infty. \tag{I.3}$$

Our result in the single-agent benchmark (Proposition 1 of the main text) requires that Φ be regular and have a thin left tail. Our insights that crime entanglement hurts witness credibility and harms crime deterrence, namely, Theorems 1 and 2 (except for the 4th statement of Theorem 1, which concerns comparative statics), are valid for all distributions with support unbounded from below. The comparative statics result (statement 4 of Theorem 1 and Proposition 7) requires Φ to be regular. The second requirement of *regularity* is used to derive inequality (A.2) in the main text, namely, agents report with higher probability in environments with more agents, and the third requirement of regularity is used to conclude that informativeness is lower when there are more agents since the reporting thresholds are higher and the distance between them is smaller.

To give some concrete examples, normal distributions are regular and have a thin left tail. Exponential distributions are regular but do not have a thin left tail. Any distribution that is regular with a tail thinner than the exponential distribution has a thin left tail. Pareto distributions have a support that is unbounded from below. However, they are not regular and do not have thin left tail.

References

[1] Myerson, Roger (1978) "Refinements of the Nash Equilibrium Concept," *International Journal of Game Theory*, 7(2), 73-80.