

## PUBLIC OUTRAGE AND CRIMINAL JUSTICE: LESSONS FROM THE JESSICA LAL CASE

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Witness tampering and public outrage have combined to affect judicial outcomes in a series of high-profile criminal cases in India. We study how these phenomena operate together in a country with extremes of wealth and poverty, but with functioning judicial and political systems. Bribes and threats are intricately linked in the strategic interaction between offenders and witnesses. Not only do bribes provide a direct incentive that can suppress testimony, they also signal a greater likelihood of retaliation and hence serve as implicit threats to witnesses. The possibility of public outrage turns out to be an effective constraint on witness tampering. In many situations, greater media effectiveness can improve the administration of justice, even when more obvious improvements in judicial effectiveness cannot.

### 1. Introduction

During the early hours of April 30, 1999, a thirty-four year old model named Jessica Lal<sup>1</sup> was shot and killed at a private party in a South Delhi restaurant, allegedly for refusing to serve liquor to a guest after the bar had closed. The man in question was identified by three eye witnesses as Manu Sharma, the son of a senior Congress Party politician and former Union minister. After several days in hiding, Sharma surrendered to authorities in Chandigarh. In an interview with police that was subsequently broadcast on national television, Sharma confessed to the murder. This confession was later retracted, and a plea of non-guilty entered at trial. During the trial the three critical eye witnesses recanted earlier statements made to the police, and twenty-nine witnesses of lesser importance did the same. One of the eye witnesses, Shyan Munshi, changed his testimony so completely that his revised statement was used as exculpatory evidence by the defence.

Sharma and eight other codefendants were acquitted of all charges in February 2006, resulting in a public outcry against what was perceived to be a gross miscarriage of justice. During the weeks that followed the verdict, petitions were circulated, protest marches organized, and candlelight vigils held. Prime Minister Mammohan Singh publicly expressed concern at the general phenomenon of witnesses changing their testimony, in an oblique reference to the Jessica Lal case. President Abdul Kalam received a petition of 200,000 names collected by journalists at NDTV, and promised action. The decision was appealed to the Delhi High Court by the prosecution in March, and in December the lower court ruling was reversed with respect to three of the defendants. Manu Sharma was convicted of murder and sentenced to life in prison, and two other defendants were convicted for conspiracy and destruction of evidence. (The verdict has been appealed to the Supreme Court, but Sharma remains in prison.) Shyan Munshi and other prosecution witnesses who turned hostile during the trial currently face possible charges of perjury.<sup>a</sup>

The Jessica Lal case is one of several recent high-profile criminal cases that illustrate in dramatic fashion the manner in which witness tampering and public outrage can interact to determine judicial outcomes in India (four others are discussed below). In countries with high levels of inequality but with legal systems that function well enough that affluent individuals fear what poor people will say about them in court, there are incentives and opportunities for powerful criminal defendants to bribe or threaten witnesses. There are costs to witnesses from accepting bribes, but also significant risks associated with testifying against powerful interests in countries with limited witness protection programs. The relative costs of different actions depend, in expectation, on the extent to which public outrage over miscarriages of justice can be channeled through the press. Freedom of the press can therefore be an important constraint on the miscarriage of justice in developing countries.

The mechanism through which public sentiment affects the functioning of the criminal justice system is an example of what Albert Hirschman (1970)<sup>3</sup> has called *voice*. Hirschman argued that voice could serve as an alternative to competition in enhancing efficiency within organizations. Since

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<sup>a</sup>For a collection of contemporaneous news reports from the earliest stages of the case to the present day, see <http://www.rediff.com/news/jessica.html>. The Delhi High Court decision is available online as Criminal Appeal No. 193 of 2006 at <http://delhihighcourt.nic.in/>.<sup>2</sup>

judicial systems, unlike firms, are not subject to the pressures exerted by competitive markets, voice takes on even more importance in determining their level of functionality.

This paper explores the manner in which voice interacts with more familiar incentives in determining the incidence of witness tampering. We begin with the observation that the offer of a bribe can affect witness incentives in two quite distinct ways. There is a direct monetary inducement to remain silent (or give false testimony), and there is a more subtle effect on witness beliefs regarding the likelihood of retaliation. If the offer of a bribe is a signal that the offender is more likely to retaliate, bribes can be far more effective in reducing testimony than the monetary inducements alone would predict. We show how such effects can arise in equilibrium, and how the possibility of public outrage in response to a miscarriage of justice affects beliefs and behavior.

Our model is characterized by unobserved heterogeneity among both witnesses and offenders. Witnesses differ in the satisfaction they experience from testifying, and offenders differ in the costs they would incur to harm witnesses who testify, and the cost of giving bribes. Some offenders have powerful revenge motives and gain from attacking witnesses who have testified against them, even after the fact, and even when those witnesses have accepted no bribes. This motive is amplified if a witness testifies even after accepting a bribe.

We identify the existence of equilibria in which offenders with strong revenge motives are disproportionately more likely to offer bribes. Bribes therefore serve as a (noisy) signal of the viciousness of the offender: on average, offenders who offer bribes are more likely to attack witnesses than those who do not. In addition, the acceptance of a bribe changes offender payoffs in such a manner as to make retaliation more likely. Both of these effects result in an increased subjective evaluation on the part of witnesses of the likelihood that testimony will be met with retaliation. Bribes are not simply bribes; they are also veiled threats.

Greater judicial effectiveness and greater media effectiveness have very different equilibrium effects in this model. If the likelihood and severity of punishment faced by offenders (conditional on truthful witness testimony) is increased, more offenders offer bribes, and these are perceived by witnesses to be less threatening on average. The rate of testimony conditional on a bribe offer therefore increases, although overall levels of testimony may decline since attempted bribery is more common. In contrast, an increased likelihood of public outrage (for instance due to greater media effective-

ness) results in fewer offers of bribes but a greater perception on the part of witnesses that testimony will be met with retaliation. Bribes become less frequent but more threatening. The likelihood of testimony conditional on a bribe offer may decline, but the overall rate of testimony could nevertheless rise since in incidence of attempted bribery declines. Interestingly, greater media effectiveness increases the rate of testimony whenever judicial effectiveness fails to do so. Finally, more witness tampering occurs when wealth differences between offenders and witnesses are great, and favor offenders. Lowering inequality can therefore reduce the incidence of witness tampering.

This paper is a theoretical contribution to a growing body of literature that finds real effects flowing from the organization of communications media. For instance Besley and Burgess (2002)<sup>4</sup> show how newspaper circulation affects the distribution of food aid and calamity relief in India, Gentzkow, Glaeser, and Goldin (2006)<sup>5</sup> relate the reduction in corruption in US politics between 1870 and 1920 to changes in the newspaper business, and Djankov et al. (2003)<sup>6</sup> relate state media ownership to various measures of poor government performance. Our result that greater press freedom can be effective in securing convictions even when greater judicial effectiveness cannot do so may perhaps be viewed as a theoretical corroboration of the empirical finding of McMillan and Zoido (2004)<sup>7</sup> that Fujimori's government in Peru was willing to pay vastly more in bribes to influence a television station than to influence a judge. Note, however, that notional freedom of the press need not imply substantive freedom, and effective control of the media by governments can arise endogenously without formal censorship; see Besley and Prat (2006)<sup>4</sup> for theoretical insights into this process.

Before proceeding to the formal model and analysis, we survey four additional cases involving prominent defendants, witness reversals, significant media attention, and public outrage.

## **2. Other Cases**

### ***2.1. The Priyadarshini Mattoo Case***

Priyadarshini Mattoo was a twenty-five year old law student when she was raped, brutally beaten and strangled to death at her New Delhi residence on January 23, 1996. Although there was no eye witness to the murder, physical and circumstantial evidence pointed immediately to Santosh Kumar Singh, the son of a senior police officer then posted in Pondicherry. Singh had been

stalking Mattoo for over a year at the time of the murder, with multiple instances of harassment having been reported to the police. He was seen outside her residence by a neighbor immediately prior to the attack, and blood stained pieces of his motorcycle helmet vizor were found beside the body. DNA tests confirmed the presence of his semen on her clothes and her blood on his helmet.

What seemed like an open and shut case, however, ended in an acquittal in 1999. Defence claims that the physical evidence had been tampered with while in police custody were given enough credence by trial judge to allow for reasonable doubt. Suspicions were raised by the judge regarding deliberate police misconduct, including false depositions, traced to the influence of the father of the accused: by the time of the trial Singh's father was among the most senior police officers in Delhi.

The acquittal triggered massive public outrage, and the case was appealed to the Delhi High Court in 2000. Little action was taken for several years, until the 2006 acquittal of Manu Sharma for the Jessica Lal murder led to renewed scrutiny and a sense of urgency in the part of the Court. The verdict of the lower court was reversed in October 2006, with the High Court finding that the "circumstantial evidence in the case is absolutely inconsistent... with the innocence of the respondent." Justices RS Sodhi and PK Bhasin observed that the acquittal by the trial judge had "shocked the judicial conscience" of their Court. Singh was sentenced a few days later to death by hanging.

## **2.2. *The Nitish Katara Case***

While studying at the Institute of Management Technology in Ghaziabad in 1998, Nitish Katara became romantically involved with a classmate, Bharti Yadav. Bharti was the daughter of D.P. Yadav, a major force in Uttar Pradesh politics, and the sister of Vikas Yadav, who was subsequently convicted for destruction of evidence in the Jessica Lal case. Her family disapproved of the relationship and Katara received multiple threats over the course of their relationship.

On the night of February 2, 2002, Katara attended a wedding at which several members of Bharti's family were present. Four witnesses observed him leaving in the company of three men, including Vikas Yadav and a cousin, Vishal Yadav. Katara's remains, charred and battered beyond recognition, were found on a roadside the next morning. Vikas Yadav and a cousin, Vishal Yadav, went into hiding but were arrested a few days later. A

detailed confession, admitting to the abduction and murder, was recorded by UP police and aired on national television. Vikas admitted to having killed Nitish with a hammer blow to the head and setting his lifeless body on fire. He subsequently led police to the spot where the body had been dumped and the murder weapon concealed.

Once the trail began, however, one witness after another “turned hostile”, including all four witnesses who had earlier reported having seen Katara depart with Vikas and Vishal Yadav. In testimony before the court, Bharti Yadav denied a romantic relationship with Katara, admitting only to a vague friendship. There remains a single witness, a passer-by whose scooter broke down on the road taken by the accused, and who has testified to seeing Katara in the vehicle. This witness has reported having received threats against his life, and is currently under police protection. The case remains unresolved, and under intense public scrutiny.

### **2.3. *The BMW Hit-and-Run Case***

At around 4am on January 10, 1999, a speeding black BMW crashed through a police checkpoint in Delhi, killing four people on the spot. Two others subsequently succumbed to injuries, leaving just one survivor, Manoj Malik. Three of the dead were police constables. A passer by who witnessed the crash, Sunil Kulkarni, came forward a few days later. According to his initial report to police, three individuals stepped out of the car, briefly inspected the damage, then fled from the scene. The damage was so extreme that the speed of the vehicle upon impact was estimated to be 140 kmph (about 90 mph).

The car was alleged to have been driven by Sanjeev Nanda, son of businessman and arms dealer Suresh Nanda, and grandson of Navy Admiral S.M. Nanda. Also present in the vehicle were his friends Siddharth Gupta and Manik Kapoor. They were returning to Delhi from a party in Gurgaon, and Sanjeev was found to have elevated levels of alcohol in his blood several hours after the incident. The BMW was traced by police following oil leaks from the scene of the crash to the Gupta residence, where it was determined to have been cleaned of blood and human remains. All three were charged with culpable homicide and destruction of evidence.

The trial is still in progress, but there have already been extraordinary changes in witness testimony. Claiming that his initial statement was made under police pressure, Kulkarni testified in October 1999 that it had been a truck rather than a BMW that had ploughed through the police check-

point.<sup>b</sup> The prosecution dropped him as a witness, considering him to be unreliable, but he was subsequently reinstated. In May 2007, Kulkarni identified Nanda as one of the three occupants of the vehicle, but then retracted this testimony two months later, saying that he had been unable to see any of them clearly.<sup>c</sup> Nanda now maintains that he was not in the vehicle at the time and had nothing to do with the accident. A sting operation by NDTV turned up evidence of attempted bribery, and it now appears that the witness spent eighteen months residing at a farmhouse owned by the lead lawyer for the defence. Nanda is free on bail while the proceedings continue.

#### **2.4. *The Best Bakery Case***

The *Best Bakery* was a Muslim owned and operated business in Vadodara, Gujarat that was set on fire by a Hindu mob during communal riots on March 1, 2002.<sup>10</sup> Fourteen people were killed in the attack, including the owner Habibullah Shaikh and eight other members of his family. Among the witnesses was Zahira Shaikh, the owner's eighteen year old daughter, who identified several individuals in the mob in a March 2 statement to police. The accused were also identified by Zahira in a statement before the National Human Rights Commission (NHRC) of India three weeks later. Twenty-one individuals were charged in the murder.

During the trial in May 2003, Zahira and other surviving members of her family retracted earlier statements made to the police, resulting in the acquittal of all the accused on June 27. Shortly thereafter, on July 11, Zahira claimed in a sworn statement before the NHRC that she and other family members had been threatened and forced to retract their statement. In doing this, she was assisted by Teesta Setalvad, secretary of the NGO *Citizens for Justice and Peace*. The NHRC petitioned the Supreme Court of India to order a retrial in a state other than Gujarat, and the Court did so on April 12, 2004. The retrial began in October 2004, before a Special Court of Sessions in Mumbai.

At a dramatic November 3 press conference one day before she was due in court, Zahira changed her testimony yet again, claiming that she had been abducted by Setalvad and her organization, threatened and confined for months, and forced to file false statements against the accused. A sting

<sup>b</sup> "BMW witness takes U-turn; says it was truck", *Indian Express*, October 2, 1999.<sup>8</sup>

<sup>c</sup> "Key Witness Identifies Nanda in BMW Case", *The Hindu*, May 18, 2007; "BMW Case: Another U-Turn by Kulkarni", *The Times of India*, July 20, 2007.<sup>9</sup>

operation by *Tehelka* magazine in December revealed that a substantial bribe of 1.8 million rupees (about \$40,000) was paid to Zahira and her family in order to retract her testimony against the accused. On February 24 2006, nine of the original accused were convicted and eight acquitted by the Court. In separate proceedings, Zahira was convicted of perjury and contempt of court.

### 2.5. Overview

Two common themes run through these cases: dramatic changes in witness testimony in response to threats or bribes, and significant media and public involvement. In the Lal, Mattoo, and Best Bakery cases, public action played a major role in the reversal of earlier verdicts. In the Best Bakery case, such action was mediated through an NGO, *Citizens for Justice and Peace*. Media outlets such as *Tehelka* magazine and NDTV aired confessions which clearly galvanized public opinion.<sup>d</sup> We explore these common themes more formally below, using a model of witness intimidation and public outrage which highlights strategic aspects of the interaction between offenders and witnesses.

### 3. A Model of Witness Tampering

Several of the cases discussed above involve not only charges of witness intimidation but also allegations of bribery. Why might threats to witnesses be supplemented with bribes? The most obvious explanation is that they offer witnesses an additional direct inducement to turn hostile. But there is also a more subtle reason: bribes may affect witness beliefs regarding the consequences of ignoring threats, and hence make testimony more risky. If bribes can lower the rate of witness testimony to a greater extent than threats alone, they may be worthwhile for offenders despite the greater costs entailed. We explore these interactions in a model that allows for bribery, retaliation, and the possibility that public outrage can lead to the reversal of acquittals and the punishment of witnesses who accept bribes.<sup>e</sup>

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<sup>d</sup>Even some of the main protagonists made an appearance in multiple cases: Delhi High Court Justices RS Sodhi and PK Bhasin handled the cases of both Lal and Mattoo, and Vikas Yadav was among the accused in the cases of Lal and Katara.

<sup>e</sup>The model developed here builds on our earlier work on witness intimidation (O'Flaherty and Sethi, 2007),<sup>11</sup> which was motivated by interactions between offenders and witnesses in the United States. In that work we considered explicit threats but not bribes, and did not take into account the possibility that public outrage could result

### 3.1. Preliminaries

Consider a crime involving one offender and one witness. The testimony of the witness is crucial to the case against the offender. If the witness does not testify, the offender will be acquitted. If the witness testifies truthfully, the offender suffers expected punishment  $\rho > 0$ . The magnitude  $\rho$  reflects both the probability that the offender will be convicted conditional on the witnesses testimony, and the severity of the punishment that will ensue upon conviction. Thus  $\rho$  could increase either because of changes in the way prosecutors and judges operate that increase the probability of conviction contingent on witness testimony, or because of harsher sentences. We will call changes in  $\rho$  changes in *judicial effectiveness*.

In order to deter the witness from testifying (or more generally to induce false testimony) the offender may offer the witness a bribe, which the witness may either reject or accept. Acceptance of the bribe has value  $\alpha > 0$  to the witness. Following this decision, the witness may either testify or decide against doing so. If the witness testifies, the criminal may retaliate by harming the witness. In this case the witness suffers damages  $\delta$ , and the offender incurs a cost which is assumed to be private information and, for reasons discussed below, contingent on whether or not a bribe was accepted prior to the testimony.

An offender who does not attempt to bribe the witness, or whose bribe is rejected, pays a cost  $\gamma$  to harm a witness who testifies. This cost is drawn from a continuous distribution  $F(\gamma)$  with support  $[\gamma_{\min}, \infty)$ , where  $\gamma_{\min} < 0$ . Hence there are some offenders who take pleasure in harming witnesses who have testified against them, even if the witnesses have rejected a bribe or were never offered one. We refer to  $\gamma$  as the offender *type*.

The cost of harming a witness who has accepted a bribe is dependent on the offender type, and denoted  $c(\gamma)$ , assumed to be continuous and strictly increasing with  $c(\gamma) \leq \gamma$ , with strict inequality holding for all  $\gamma > \gamma_{\min}$ . In other words, the cost of harming a witness who testifies after accepting a bribe is lower than the cost of harming a witness who has not accepted a bribe. This is motivated by the idea that testimony following the acceptance of a bribe is a form of betrayal, or a violation of an implicit contract, which further inflames the revenge motive for harming witnesses who testify.

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in the reversal of an acquittal. Akerlof and Yellen (1994)<sup>12</sup> have also explored the manner in which a fear of reprisals affects community cooperation with law enforcement and the equilibrium level of crime, but without considering the strategic effects of bribery or voice.

Since  $c(0) < 0$ , there is some subset of offenders who are prepared to harm witnesses who testify after having accepted a bribe, even if such offenders would *not* harm witnesses who either reject the bribe or were not offered one. Let  $\bar{\gamma} > 0$  denote the offender type for which  $c(\bar{\gamma}) = 0$ . Then the proportion of offenders who are prepared to harm witnesses who testify after accepting a bribe is simply  $F(\bar{\gamma})$ ; we refer to these offenders as *violent*. Since  $\gamma$  is private information, a witness cannot be certain that an offer of a bribe comes from a violent offender.

The cost of bribing a witness is also dependent on the offender type, and given by a non-negative, continuous, and strictly increasing function  $b(\gamma)$ . Hence bribing a witness is cheapest for those offenders for whom harming the witness is also cheap.

Witnesses are also heterogeneous, and vary in the payoff they obtain from testifying against offenders. A witness who testifies receives a (privately observed) payoff  $\beta > 0$ , drawn from a continuous distribution  $G(\beta)$  also having support  $[0, \infty)$ . We refer to  $\beta$  as the witness type. This payoff may be interpreted as the satisfaction obtained from an act of retribution, or simply from performing one's civic duty. Which of these motives drives witnesses to testify depends on the context; retribution may have been particularly important in the Best Bakery case. Since offenders cannot observe  $\beta$ , they cannot know whether or not the offer of a bribe will induce a witness to refrain from testifying.

We introduce voice into this simple model of witness tampering by allowing for the possibility that public outrage can result in the reversal of an acquittal that is perceived to be unjust. Specifically, if the witness accepts a bribe and turns hostile, there is a probability  $\eta$  that the acquittal will be reversed upon appeal. In this case the offender receives the same punishment,  $\rho$ , that would have followed an immediate conviction. In addition, the witness receives punishment  $\sigma$ . This makes it more costly for witnesses to accept bribes, and makes bribes less effective in securing acquittals. We assume that  $\alpha > \eta\sigma$ , otherwise bribes would never be accepted even by witnesses who refuse to testify.<sup>f</sup>

The parameters  $\alpha$ ,  $\delta$ ,  $\rho$ ,  $\eta$  and  $\sigma$ , the functions  $b(\gamma)$  and  $c(\gamma)$ , and the distributions  $F$  and  $G$  are all assumed to be commonly known.

None of our results are sensitive to the manner in which ties are broken,

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<sup>f</sup>One way to interpret the condition  $\alpha > \eta\sigma$  is that the size of the bribe is chosen by offenders to be large enough to outweigh the expected penalty from accepting it. A fully endogenous treatment of  $\alpha$  beyond the scope of this paper.

since the set of witnesses and offenders who are indifferent in equilibrium is of zero measure. We adopt the convention that ties are broken in favor of legality: witnesses indifferent between acceptance and rejection of a bribe will reject, witnesses indifferent between testifying and not doing so will testify, offenders indifferent between offering a bribe and not doing so will not do so, and offenders indifferent between harming a witness and not doing so will not do so.

We focus below on six key probabilities, all endogenously determined in equilibrium. For a witness who has not been offered a bribe, let  $q_n$  denote the likelihood of testifying, and  $p_n$  the likelihood of being harmed conditional on testifying. For a witness who has been offered a bribe, let  $q_r$  denote the likelihood of rejecting it and testifying, and  $p_r$  the likelihood of being harmed conditional on having done so. Finally, let  $q_a$  denote the likelihood of accepting and testifying, and  $p_a$  the likelihood of being harmed conditional on this.

### 3.2. Witness Behavior

A witness who has not been offered a bribe can either testify and obtain a payoff  $\beta - p_n\delta$ , or remain silent and get payoff 0. Hence the likelihood that the witness will testify is given by

$$q_n = 1 - G(p_n\delta). \quad (1)$$

A witness who has been offered a bribe has four options: accept and testify ( $AT$ ), reject and testify ( $RT$ ), accept and not testify ( $AN$ ), and reject and not testify ( $RN$ ). The expected payoffs to the witness from the first two options depend on the endogenous probabilities of harm as follows:

$$\begin{aligned} \pi_{AT} &= \alpha + \beta - p_a\delta, \\ \pi_{RT} &= \beta - p_r\delta. \end{aligned} \quad (2)$$

Note that there is no public outrage as long as the witness testifies, even if he does so after accepting a bribe. In this case the offender is convicted and the offer and acceptance of the bribe remain undetected.

Of the two options in which the witness does not testify, rejection of the bribe yields  $\pi_{RN} = 0$  and is therefore strictly dominated by acceptance of the bribe, yielding

$$\pi_{AN} = \alpha - \eta\sigma,$$

which we have assumed to be strictly positive.

A witness will accept the bribe and refuse to testify if and only if  $\beta < \min\{p_a\delta - \eta\sigma, p_r\delta + \alpha - \eta\sigma\}$ . Hence the likelihood of testimony conditional on a bribe being offered is

$$q_a + q_r = 1 - G(\min\{p_a\delta - \eta\sigma, p_r\delta + \alpha - \eta\sigma\}). \quad (3)$$

What if  $\beta \geq \min\{p_a\delta - \eta\sigma, p_r\delta + \alpha - \eta\sigma\}$ ? In this case the witness will reject the bribe and testify if

$$\alpha \leq \delta(p_a - p_r), \quad (4)$$

and accept the bribe and testify if this inequality does not hold. Since (4) is independent of  $\beta$ , it will never be the case that both AT and RT are selected with positive probability. Hence either  $q_a = 0$  or  $q_r = 0$  in equilibrium.

### 3.3. Offender Behavior

Since witnesses who are not offered a bribe testify with probability  $q_n$ , the expected payoff to criminals who do not offer a bribe is

$$\pi_n = -q_n(\rho + \min\{0, \gamma\}) \quad (5)$$

The expected payoff to an offender who does offer a bribe is

$$\pi_b = -q_a(\rho + b(\gamma) + \min\{0, c(\gamma)\}) - q_r(\rho + \min\{0, \gamma\}) - (1 - q_a - q_r)(b(\gamma) + \eta\rho), \quad (6)$$

Where the last term reflects that fact the conviction will result with probability  $\eta$  even if a bribe is accepted and the witness remains silent.

## 4. Equilibrium

Since the costs of bribery and retaliation both rise with  $\gamma$ , it may be conjectured that there exists an equilibrium with a partitioned structure, in which offenders with high costs choose not to bribe and those with low costs bribe. The bribe serves also as a threat since it signals a higher likelihood of retaliation. Witnesses are therefore less likely to testify when offered the bribe. We identify conditions under which such an equilibrium does indeed exist.<sup>§</sup>

We focus on equilibria with the property that there exists some  $\tilde{\gamma} > \bar{\gamma}$  such that all offenders with  $\gamma < \tilde{\gamma}$  offer a bribe in the equilibrium and

<sup>§</sup>Without any restrictions on out-of-equilibrium beliefs, there always exists an equilibrium in which no intimidation occurs and witnesses who are offered a bribe (off the equilibrium path) believe that the offer is from a nonviolent offender. Such equilibria are discussed in the appendix, together with the restrictions on out-of-equilibrium beliefs that are sufficient to rule out their occurrence.

those with  $\gamma \geq \tilde{\gamma}$  do not. In this case, equilibrium probabilities of offender violence conditional on witness testimony satisfy

$$p_n = 0, \quad (7)$$

$$p_r = \frac{F(0)}{F(\tilde{\gamma})}, \quad (8)$$

$$p_a = \frac{F(\tilde{\gamma})}{F(\tilde{\gamma})}, \quad (8)$$

so  $p_a > p_r > p_n$ . Those who are offered a bribe face a greater likelihood of violence conditional on testimony, and this likelihood is highest if they accept the bribe before testifying. We show below that the following conditions are sufficient for the existence of such an equilibrium:

$$b(0) + \eta\rho < G(F(0)\delta) (\rho + \gamma_{\min}), \quad (9)$$

$$b(\tilde{\gamma}) + \eta\rho < \rho G(F(0)\delta). \quad (10)$$

These two conditions require that the costs of bribing witness are not too large relative to the other specifications of the model, in the case of offenders with  $\gamma = 0$  and  $\gamma = \tilde{\gamma}$ . (Note that since  $\gamma_{\min} < 0$ , the second condition is not implied by the first.) Condition (9) ensures that offenders are not so strongly retaliatory that they want witnesses to testify against them simply to get the satisfaction of harming them, while (10) ensures that the threshold  $\tilde{\gamma}$  exceeds  $\bar{\gamma}$ , so all potentially violent offenders offer bribes.

In addition, we assume the following:

$$\alpha < \delta (F(\tilde{\gamma}) - F(0)). \quad (11)$$

We show below that this condition ensures that (4) holds in equilibrium, so witnesses who testify after being offered a bribe do so after rejection rather than acceptance. As a consequence,

$$0 = q_a < q_r < q_n = 1$$

in equilibrium. We then have (see Appendix for proof):

**Proposition 1.** *If (9–11) hold, then there exists an equilibrium with the following properties: (i) all violent offenders and some nonviolent offenders offer bribes, (ii) all witnesses who do not receive bribe offers testify and remain unharmed, and (iii) all witnesses who do receive bribe offers either reject the offers and testify, or accept them and do not testify.*

## 5. Comparative Statics

### 5.1. Greater Judicial Effectiveness

Note that the marginal offender type  $\tilde{\gamma}$  must be indifferent between bribing the witness and not doing so:  $\pi_b = \pi_n$  for this type. Since  $q_n = 0$ ,  $\pi_n = -\rho$ . And since  $\tilde{\gamma} > \bar{\gamma} > 0$  and  $q_a = 0$ , (6) simplifies to

$$\pi_b = -q_r \rho - (1 - q_r) (b(\tilde{\gamma}) + \eta \rho).$$

Hence the indifference condition for the marginal type is simply

$$b(\tilde{\gamma}) = (1 - \eta) \rho. \quad (12)$$

An increase in the penalty  $\rho$  that offenders face if the witness testifies truthfully therefore implies an increase in the threshold  $\tilde{\gamma}$ , and hence an increase in  $F(\tilde{\gamma})$ , which is the proportion of offenders who choose to offer bribes. Assuming that the conditions (9–11) continue to hold, witnesses will either reject the bribe and testify, or accept it and refrain from testifying. The likelihood of violence conditional on testifying decreases, since

$$p_r = \frac{F(0)}{F(\tilde{\gamma})}.$$

The probability of testifying conditional on receiving an offer of a bribe is

$$q_r = 1 - G(p_r \delta + \alpha - \eta \sigma),$$

which rises as a result.

**Proposition 2.** *Greater judicial effectiveness results in an increased incidence of attempted bribery, but a decline in the proportion of bribes that are accepted, and a decline in the likelihood that witnesses who testify will be harmed.*

The effect on the overall rate of testimony, however, is ambiguous. If  $q_r$  is initially low and changes little in response to the decline in  $p_r$ , the increased incidence of attempted bribery may result in a decline in testimony and convictions. On the other hand if  $q_r$  is initially high (so bribes are frequently rejected) and is sensitive to changes in  $p_r$ , the overall rate of testimony and offender conviction will rise. To be precise, the overall rate of testimony (and hence conviction) is

$$t = q_r F(\tilde{\gamma}) + (1 - F(\tilde{\gamma})) = 1 - F(\tilde{\gamma}) G\left(\frac{\delta F(0)}{F(\tilde{\gamma})} + \alpha - \eta \sigma\right). \quad (13)$$

An increase in  $F(\tilde{\gamma})$ , arising for instance from harsher penalties for convicted offenders, raises  $t$  if and only if

$$\frac{g}{G} > \frac{F(\tilde{\gamma})}{\delta F(0)} = \frac{1}{p_r \delta}, \quad (14)$$

where  $g$  is the density function derived from  $G$ , and  $g/G$  is evaluated at the initial equilibrium. Thus harsher penalties are effective when the elasticity  $g/G$  is high and the danger of turning down a bribe  $p_r \delta$  is great.

### 5.2. Greater Voice

From the indifference condition for the marginal offender (12), the effect of an increase in the voice parameter  $\eta$  is to lower the threshold  $\tilde{\gamma}$  and hence the incidence  $F(\tilde{\gamma})$  of bribery, but with an increase in the likelihood of violence conditional on testimony:

$$p_r = \frac{F(0)}{F(\tilde{\gamma})}.$$

But this need not result in a lower rate of testimony conditional on being bribed, since

$$q_r = 1 - G(p_r \delta + \alpha - \eta \sigma).$$

**Proposition 3.** *Public outrage results in a decreased incidence of attempted bribery, but an increase in the likelihood that witnesses who testify will be harmed.*

The effect on the rate of testimony is again ambiguous. Testifying is less attractive because the expected cost of reprisals from the offender is greater, but not testifying is also less attractive because the expected cost of reprisals from public outrage is also greater.

Since greater media effectiveness reduces  $F(\tilde{\gamma})$  while harsher penalties increase it, greater media effectiveness always increases testimony when (14) fails and greater judicial effectiveness reduce testimony. But the direct effect of greater media effectiveness increases testimony holding  $F(\tilde{\gamma})$  constant. So there are instances when both greater media effectiveness and greater judicial effectiveness raise testimony, and there are no instances when neither does so.

Hence public outrage and greater judicial effectiveness have exactly opposite effects on the incidence of bribery and the likelihood of violence.

Even though both may lead to greater convictions and overall testimony, the channels through which they operate are very different. Voice is not simply another form of deterrence, it leads to qualitatively different outcomes.

### 5.3. *Wealth and Inequality*

In most of the cases that motivate this paper, the offender was rich and powerful, and the witnesses were not. Does this inequality matter?

Rich offenders have lower  $b(\gamma)$  schedules than poor offenders. In (12) a shift downward in the  $b(\gamma)$  schedule raises the bribe threshold  $\tilde{\gamma}$ . Richer offenders are more likely to offer bribes. Thus comparing rich and poor offenders, rich offenders act as if they face harsher penalties: they attempt more bribes, but fewer bribes are accepted, and they are less likely to harm witnesses who testify.

Richer witnesses would value the non-pecuniary benefits of testimony  $\beta$  relatively more than the pecuniary benefits of bribery  $\alpha$ . This is reflected in a rightward shift of the  $G$  distribution. Richer witnesses do not affect the propensity of offenders to bribe (12) but they are more likely to testify after they have rejected a bribe:  $q_r$  is higher. Overall, then, the rate of testimony (13) rises as the wealth of witnesses rises.

These comparative statics results presume that conditions (9–11) continue to hold. But conditions (9) and (10) both have  $b$  on the left hand side and  $G$  on the right. As offenders get poorer and witnesses get richer, the left hand side rises and the right hand side falls. Thus the existence of the witness-tampering equilibrium we have described depends on inequality between offenders and witnesses. Growing inequality can give rise to witness tampering even without any changes in legal institutions.

## 6. Conclusion

In many ways the witness tampering cases that have motivated our analysis reveal the strength of the Indian judicial system. Civilians were bribed and threatened, not prosecutors or judges. Poor people were bribed because it was feared that their testimony would be credible. And the media exposed it. A lot has to be going right for witness tampering to be publicly acknowledged problem. We have shown, moreover, that effective legal institutions do not eliminate witness tampering and may even exacerbate it.

A major open question that remains is the following: what determines the willingness of the media to expose witness tampering and the willingness

of ordinary people to testify in the face of threats, specific or amorphous? Public outrage is seldom entirely spontaneous; it is often intentionally provoked. This may be done by media outlets to increase circulation or ratings, or by politicians for electoral advantage. Understanding this process, and therefore understanding how the contentiousness of Indian politics gives rise to such cases is an important missing piece of our analysis.

The central message of this paper is that legal institutions alone are not enough to produce justice. In terms of Albert Hirschman's memorable formulation, effective judicial systems require a balance of exit and voice. Open competition in politics and the media facilitates and amplifies the expression of voice, keeping blatant miscarriages of justice at least occasionally in check.

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### Appendix

#### *Proof of Proposition 1.*

Consider a candidate equilibrium such that, for some  $\tilde{\gamma} > \bar{\gamma}$  all offenders with  $\gamma < \tilde{\gamma}$  offer a bribe and those with  $\gamma \geq \tilde{\gamma}$  do not. At any such equilibrium,  $p_n = 0$  and  $q_n = 1$ . Assume for the moment that (4) holds, so  $q_a = 0$ . (We show below that this is consistent with equilibrium). From (7) and (8), and the fact that  $F(\tilde{\gamma}) < 1$ , we have

$$p_r > F(0),$$

and

$$p_a > p_r.$$

Hence from (3) and the assumption that (4) holds and  $q_a = 0$ ,

$$q_r = 1 - G(p_r\delta + \alpha - \eta\sigma) < 1 - G(F(0)\delta) \quad (15)$$

Now for any  $\gamma \leq 0$ ,

$$\pi_n = -(\rho + \gamma)$$

and, since  $q_a = 0$ ,

$$\begin{aligned} \pi_b &= -q_r(\rho + \gamma) - (1 - q_r)(b(\gamma) + \eta\rho) \\ &\geq -(1 - G(F(0)\delta))(\rho + \gamma) - (1 - q_r)(b(\gamma) + \eta\rho) \\ &\geq -(1 - G(F(0)\delta))(\rho + \gamma) - (b(\gamma) + \eta\rho) \\ &\geq -(\rho + \gamma) + G(F(0)\delta)(\rho + \gamma_{\min}) - (b(\gamma) + \eta\rho). \end{aligned}$$

Hence an offender with  $\gamma < 0$  will choose to bribe if

$$b(0) + \eta\rho < G(F(0)\delta)(\rho + \gamma_{\min}),$$

which is (9).

Now consider offenders with  $\gamma \geq 0$ . For any such offender,  $\pi_n = -\rho$  and  $\pi_b$  is decreasing, with  $\lim_{\gamma \rightarrow \infty} \pi_b = -\infty$ . So there exists a unique  $\tilde{\gamma}$  for which  $\pi_n = \pi_b$ . (This follows from the continuity of  $\pi_b$  in  $\gamma$  at  $\gamma = 0$ .) To verify that  $\tilde{\gamma} > \bar{\gamma}$ , we need to show that the type  $\tilde{\gamma}$  strictly prefers to offer a bribe. Note that for this type, using (15) and  $q_a = 0$ , we have

$$\begin{aligned} \pi_b &= -q_r\rho - (1 - q_r)(b(\tilde{\gamma}) + \eta\rho) \\ &\geq -(1 - G(F(0)\delta))\rho - (1 - q_r)(b(\tilde{\gamma}) + \eta\rho) \\ &\geq -(1 - G(F(0)\delta))\rho - (b(\tilde{\gamma}) + \eta\rho) \end{aligned}$$

So type  $\tilde{\gamma}$  prefers to offer a bribe if

$$b(\tilde{\gamma}) + \eta\rho < \rho G(F(0)\delta),$$

which is (10). Suppose this holds, so  $\tilde{\gamma} < \bar{\gamma}$ . The likelihood that the witnesses will accept the bribe and refrain from testifying is given by (3). Witnesses who testify will do so after rejection or the bribe if

$$\frac{\alpha}{\delta} \leq p_a - p_r = \frac{F(\tilde{\gamma}) - F(0)}{F(\tilde{\gamma})}. \quad (16)$$

Since  $F(\tilde{\gamma}) \leq 1$  a sufficient condition for this is (11). Hence (4) holds and  $q_a = 0$  in equilibrium.  $\square$

#### *Equilibria without Intimidation.*

We have focused in the text on equilibria in which violent offenders intimidate witnesses. Without any restrictions on out-of-equilibrium beliefs, however, there exists a trivial (and implausible) equilibrium in which no

offender type offers a bribe, and a witness who received a bribe (off the equilibrium path) believes that it comes from an offender with  $\gamma > \bar{\gamma}$ . In this case the witness will simply accept the bribe and testify, believing that  $p_a = 0$ . Knowing this, no offender will offer a bribe. While this can be an equilibrium, the beliefs that sustain it are entirely implausible: since  $b(\gamma)$  is increasing, it would be far more reasonable to suppose that the offender making the offer had a very low value of  $\gamma$ . We make the conservative assumption that a witness receiving an offer of a bribe off the equilibrium path believes that the offender type is drawn from the distribution  $F(\gamma)$ , which corresponds exactly to the prior belief of the witness. In other words, the witness believes that the offer was made in error, and all types are equally likely to make such an error.

This is sufficient to rule out the equilibrium in which no bribes are offered. To see why, note that in any such equilibrium  $p_n = F(0)$  and hence  $q_n = 1 - G(\delta F(0))$  from (1). Hence the offender payoff, conditional on no offer of a bribe, is given by

$$\pi_n = -(1 - G(\delta F(0))) (\rho + \min\{0, \gamma\}).$$

If a bribe is offered, witness beliefs are  $p_a = F(\bar{\gamma})$  and  $p_r = F(0)$ . Hence from (3),

$$q_a + q_r = 1 - G(\min\{\delta F(\bar{\gamma}), \delta F(0) + \alpha\}).$$

Now consider an offender with  $\gamma = \gamma_{\min}$ . If  $\delta F(0) + \alpha < \delta F(\bar{\gamma})$ , then  $q_a = 0$  and this offender's payoffs satisfy

$$\pi_b - \pi_n = (G(\delta F(0) + \alpha) - G(\delta F(0))) (\rho + \gamma_{\min}) > 0,$$

so this offender type prefers to offer a bribe. Similarly, if  $\delta F(\bar{\gamma}) \leq \delta F(0) + \alpha$ , then  $q_r = 0$  and this offender's payoffs satisfy

$$\pi_b - \pi_n = (G(\delta F(\bar{\gamma})) - G(\delta F(0))) (\rho + \gamma_{\min}) > 0.$$

Again this offender prefers to offer a bribe, contradicting the hypothesis that no bribes are offered in equilibrium.

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