Citizen Oversight and the Electoral Incentives of Criminal Prosecutors

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Popular wisdom suggests that only by securing convictions can elected prosecutors cultivate the perception that they are tough on crime. This article considers why voters might use conviction rates to evaluate prosecutors and whether justice is subverted as a consequence. Citizens lack information about individual cases and prosecutor behavior. We model voter oversight of prosecutors in light of these difficulties. Voters use the promise of reelection given observed outputs to induce prosecutors to reduce uncertainty through investigation and subsequently to punish the guilty and free the innocent. The model demonstrates that an optimal voter strategy is always to reelect prosecutors who obtain convictions. Most importantly, even voters who most fear wrongful convictions should reward success at trial. Voter attitudes and beliefs instead influence rewards for cases concluded out of court, including plea bargains. Finally, we derive sanctions necessary to prevent prosecutors from suppressing evidence when doing so is politically tempting.

> The affirmative power to prosecute is enormous, but the negative power to withhold prosecution may be even greater, because it is less protected against abuse. . . . Especially important, in my opinion, is the complete lack of supervision of the typical city or county prosecutor. He is usually an elected official, and the theory is that he is responsible to the electorate. The reality is that nearly all his decisions to prosecute or not to prosecute, nearly all of the influences brought to bear upon such decisions, and nearly all his reasons for decisions are carefully kept secret, so that review by the electorate is nonexistent except for the occasional case that happens to be publicized. The plain fact is that more than nine-tenths of local prosecutors' decisions are supervised or reviewed by no one.
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> —Kenneth Culp Davis, *Discretionary Justice* (1969), pp. 188, 207–208

Perhaps no nonmilitary public official, save the police officer or prison guard, represents the potential coercive authority of the state so much as the prosecuting attorney. Although residual authority for determining punishment resides in the hands of judges and juries, prosecutors decide which cases and charges are brought forward and retain a large measure of control over the information those judges and juries review. In addition to representing the community in criminal trials and appeals, prosecutors also direct criminal investigations and arrange plea-bargains with criminal defendants. While prosecutors may use their substantial discretion in these matters to pursue the public interest, there exist longstanding concerns they might abuse this authority. A prosecutor can knowingly pursue cases of questionable merit, investigating individuals who are likely innocent.

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Even absent eventual indictment, this power constitutes a formidable incursion in the lives of citizens. A prosecutor can also decline to press charges for myriad reasons, despite a defendant's apparent guilt (Forst 1993). Prosecutors can also arbitrarily discriminate in their treatment of individuals suspected of similar crimes (Radelet and Pierce 1985; Paternoster 1984).

The vast majority of chief, state, and local felony prosecuting attorneys in the United States, unlike their counterparts in policing and corrections, are elected (over 95 percent according to a 1998 Justice Department report). Do elections allow voters to hold prosecutors accountable for their actions? Weber expressed concern that popular elections would jeopardize the neutral and efficient functioning of the bureaucracy (Weber 1921). More recently, scholars have found that elected regulators perform differently from appointed ones (Besley and Coate 2000). Davis, in the above quotation, argues that elections are poor mechanisms for citizen control because the legal process is highly complex and much of the prosecutor's work is done in secret. In fact, it is frequently impossible for the public to determine whether the prosecutor has acted at all. Confounding this monitoring problem, both the public and prosecutor rarely know the true guilt or innocence of defendants. These factors combine to produce an environment of enormous uncertainty with respect to prosecutorial activity.

At the same time, popular wisdom suggests that prosecutors, when seeking reelection, must cultivate the public image that, as guardians of public safety, they are "tough on crime."[1] This imperative manifests itself in the tendency for incumbent prosecutors to seek and eventually advertise high conviction rates. By itself, however, the conviction rate is an exceptionally poor measure of prosecutor performance. A prosecutor may pad her record by dropping or settling cases she is unlikely to win in court. She might also be tempted to knowingly prosecute an innocent defendant if a conviction is likely (Zacharias 1991). Unfortunately, it is only in rare cases, usually where evidence of misconduct surfaces after the fact, that the public can determine whether a prosecutor pursued that course of action.[2]

If conviction rates are problematic indicators of prosecutorial performance, two puzzles emerge. First, why do they play so prominent a role in district and county attorney elections? And second, is justice subverted as a consequence? We answer these questions by examining the relationship between the prosecutor and the public (represented by a pivotal voter) as a problem of mechanism design. Prosecutors are elected bureaucrats responsible for guiding cases through the judicial system. It is difficult, however, for voters to observe directly the merits of different cases and whether elected officials comply with public preferences. In light of these difficulties, we investigate techniques voters might use to monitor prosecutor conduct and reduce moral hazard. Under most conditions, voters have no choice but to rely on outcome-based performance measures like conviction rates to assess prosecutor performance.

Given this limitation, we show how the voter who conditions his choice of whether to retain an incumbent prosecutor on observed outcomes manipulates the prosecutor's incentives to exert effort investigating individual defendants, appropriately punish the guilty, and exonerate the innocent. Surprisingly, an optimal voter strategy in all cases is always to reelect prosecutors who obtain convictions and to punish those who lose at trial. This finding holds *even if* it is impossible to tell whether the prosecutor worked hard at uncovering the truth about a particular crime or was merely lucky in securing a conviction. Moreover, this strategy is superior to any other, irrespective of how tough on crime the voter is, and irrespective of how much information the voter has about individual cases.

After discussing several permutations of our basic model, we extend our approach. First, we consider voter response to observed plea bargains. If the voter rewards plea bargains too generously, knowledgeable defendants will extract favorable concessions from prosecutors who cannot commit to trial. If they punish plea bargains too severely, they forfeit the potential cost-saving and risk-reducing features of this institution. Second, we identify minimally effective sanctions necessary to deter prosecutor misconduct. We demonstrate that when voters are well informed about individual cases, sanctions are unnecessary. When voters are poorly informed, however, sanctions must be more severe when prosecutors and their staff are *more competent* and *better paid.* Finally, we explore the implications of our findings for the oversight of prosecutors and the design of the criminal

[1]Private citizens believe most criminal defendants are guilty and support harsher punishments. In a March 17, 1995 Gallup Poll, 57 percent of respondents supported the statement that ". . . a defendant in a criminal trial should be required to prove his or her innocence." Likewise, 77 percent of the respondents to the 1996 General Social Survey claimed the courts were not harsh enough with criminals, while 71 percent supported the death penalty.

[2]This is the case in well-publicized scandals surrounding the conviction and subsequent exoneration in DuPage County, Illinois of Rolando Cruz and Alejandro Hernandez, and in Dallas County, Texas of Randall Adams. The DuPage County case involved prosecutors who conspired with police to fabricate evidence of a confession. The Dallas case was profiled in the movie *The Thin Blue Line.*

justice system more generally. We also discuss the potential insufficiency of elections as means to encourage prosecutors to pursue justice.

The Voter and the Prosecutor

We begin by considering public preferences about crime policy. Throughout we will assume that voters desire that prosecutors "pursue justice." Justice is achieved when a defendant receives an appropriate punishment for his activities. Citizens must therefore be concerned with two types of criminal justice errors: overpunishment (Type I errors, given the null hypothesis is innocent until proven guilty) and underpunishment (Type II errors). Importantly, a voter in this conception obtains no intrinsic benefit from a conviction per se.[3] Rather, his relative weighting of the costs of Type I and Type II errors captures his attitudes about retribution. A strongly retributivist voter will experience a high cost associated with accidentally letting off the guilty and a comparatively low cost associated with accidentally convicting the innocent.

Our conception of public preferences is rooted in a Rawlsian understanding of criminal justice (Rawls 1971, 241). Ex ante, citizens would like to avoid being unfairly singled out for punishment. At the same time, they would also like to live without fear of being victimized by the criminal acts of others. To satisfy these needs, they seek to design institutions that assign proportional punishments for criminal behavior while protecting the innocent from unwarranted prosecution. While our framework is grounded in normative political philosophy, we make no normative claims about the appropriateness or fairness of existing criminal law. Proportional punishment, however, is a minimal requirement for efficient deterrence. If all criminal activities carried the same punishment, criminals would have an incentive to commit more serious crimes to evade prosecution, e.g., murdering witnesses of a petty theft. More generally, the deterrent value of the criminal justice system is undermined, at least in the long run, when it is error-prone (Polinsky and Shavell 2000, 60). Deterrence-minded citizens cannot be overly tolerant of Type I errors, because they, like Type II errors, weaken the link between crime and punishment.

Given citizen attitudes about criminal justice, how can voters conform prosecutor behavior to their preferences? The public faces two problems in monitoring and evaluating prosecutorial conduct. First, citizens cannot, except in rare cases, observe the true innocence or guilt of a criminal defendant. If they could, the role of prosecutors and criminal courts more generally would be merely clerical. When prosecutors investigate crimes and make decisions about which cases to bring to trial, we expect that they will rely on their expertise as legal practitioners and the information they uncover in the course of their investigations to pursue justice. Citizens are not completely uninformed, however. Accounts in newspapers, information provided to the public by prosecutors and defense attorneys, and their personal evaluations of criminal defendants (and the evidence put forth against them) allow citizens to form judgments about the likelihood of innocence for different criminal defendants. Still, this is a far cry from certain knowledge about whether a defendant "did or didn't do it."

Second, even the most informed voters cannot observe all prosecutor behavior. The possibility that voters lack adequate information to evaluate incumbent performance is well known in political science (Lupia 1992; Lupia and McCubbins 1998), and incumbents may alter their behavior in light of this possibility (Arnold 1990; Austen-Smith 1993). Evaluation of criminal prosecutors may be challenging to even the most informed and sophisticated voters. When a prosecutor makes a formal decision to move a case forward, the public can observe this decision and the outcome of any legal proceedings.[4] When a case goes to trial, a defendant is either convicted or acquitted and this outcome is part of the public record. When a case is settled through a plea bargain, a defendant will go before a court in an allocution hearing, and the plea may, depending on the state, become part of the public record. Public review of cases that are not brought forward, however, is more difficult. If a (potential) defendant has been arrested or formally arraigned, or if a grand jury indictment has been made public, then private citizens can observe that a suspect has been identified but not punished. In cases where a suspect is never identified, the public has the least information. Citizens may know only of the crime that has been committed, and perhaps, through journalistic accounts, of the obstacles a prosecutor faces in an ongoing investigation.

In addition to the formal discretionary power to try or drop a case, prosecutors also have a large influence on the continuing investigation of criminal cases. It is in the course of an investigation (while preparing for trial or seeking to develop a case) that a prosecutor can uncover

[3]As will become apparent below, allowing this kind of benefit would only strengthen our results.

[4]As a consequence of strategic behavior by the prosecutor, the decision to go to trial largely presages a guilty verdict. For instance, 87 percent of defendants charged with a federal crime were convicted in fiscal year 1998 (New York Times 2000). In some states, a prosecutor must secure an indictment from a grand jury in order to proceed to a felony trial, a hurdle widely perceived as low given evidentiary standards at that stage.

evidence that fully exonerates or implicates a suspect. In other words, while the prosecutor and the public rarely possess full information about a particular case at its outset, the prosecutor, by virtue of her position, may conceivably obtain it by exerting effort. It is difficult, however, for the public to monitor whether a prosecutor undertakes additional investigation. A prosecutor who, through her efforts, fully discerns the truth may handle a case differently than one who does not, but the public will generally be unable to distinguish between a conviction generated by this knowledge and one generated by luck alone. Similarly, it is difficult for the public to determine whether a prosecutor competently manages the pursuit of justice. A well-intentioned and hard-working prosecutor who is nonetheless a poor litigator will be ineffective in the pursuit of justice, but the public can only observe the effects of this incompetence.

Overall, uncertainty about the innocence of criminal defendants and the behavior of prosecutors combine to produce a problem of oversight. Citizens cannot determine whether a prosecutor fairly punished the guilty while letting the innocent go free because they cannot observe the true guilt of each defendant. Likewise, they cannot ascertain whether a prosecutor competently and industriously undertook a search for potentially exculpatory or damning evidence because they cannot measure the effectiveness and vigor with which a prosecutor develops cases. Because direct evaluation of the pursuit of justice is infeasible, the public must employ alternative indicators of prosecutor performance. These proxy measures could take several forms.

First, citizens could endeavor to overcome the selection problem and choose competent prosecutors whose preferences toward retribution mirror their own. This approach has its limits. Most obviously, it is difficult to judge a potential prosecutor's ideological commitment to justice or her competence. Additionally, the selection of a like-minded expert prosecutor does not fully obviate the need to encourage hard work. A justice-minded public would prefer that a prosecutor thoroughly investigate a seemingly guilty defendant's claim of innocence to insure that the innocent are not accidentally convicted, but a prosecutor might find that further investigation is too time-consuming to bother with.

Second, the voter could seek to ascertain the prosecutor's impact on the crime rate. If the crime rate declines or remains at a tolerable level, the public would choose to reelect the incumbent prosecutor. The crime rate is a poor proxy of a prosecutor's pursuit of justice, however. Even assuming that prosecutors bear complete responsibility for crime control, a short-term decline in crime would only suggest prosecutors are convicting the guilty. It would tell the public nothing about the relative frequency with which these attorneys either knowingly or unknowingly prosecute the innocent. Moreover, prosecutors have only a very small effect on the actual level of crime. Demographic trends, the health of the economy, and the level of drug use all have an independent effect on the frequency of criminal acts (see Wilson 1983, 117–144). Prosecutors are also dependent on the police to make arrests and gather evidence, on judges to make rulings favorable to the state, and on juries to vote to convict the obviously guilty. Police incompetence, lenient trial judges, and reluctant juries all distort the causal link between the criminal prosecutor's behavior and the crime rate. Finally, while prosecutors are often locally elected, criminals are mobile and do not regard electoral boundaries. Even the most stringent prosecutor can oversee an area where crime increases because of the incompetence of her colleague in the next county.

Third, citizens could directly observe a prosecutor's case output to evaluate performance. Voters can observe a prosecutor's conviction rate, her performance in cases where plea bargains have been arranged, and the proportion of cases that are not brought to trial.[5] This method of evaluation deserves particular attention because in actual electoral contests, candidates advertise these figures. For example, one candidate opposing an incumbent prosecutor in Staten Island, New York, attacked her opponent by noting, "In 1997, they tried less than 30 cases, and our conviction rate has been the lowest in the city" (Hicks 1999). Similarly, in evaluating the performance of the Queens prosecutor, a reporter for the New York Times noted, "... Mr. Brown's office had a conviction rate of 71 percent in jury trials, about average in New York City, but below the 77 percent rate of the Manhattan and Brooklyn prosecutors' offices" (Toy 1999). In addition to the focus on the number of convictions a prosecutor obtains, candidates also focus on the number of cases brought to trial and the sentences imposed. A candidate for district attorney in Austin, Texas promised to "... increase by 50 percent the number of cases brought to trial" and seek harsher sentences for known criminals (Smith 1996).[6]

[5]In a similar vein, voters can observe the performance of a prosecutor in a single, high-profile case; See Walker 1985.

[6]Prosecutors are also keenly aware of the problem that plea bargains and differences in juries bring to the evaluation of a prosecutor's record. "... (T)he District Attorney's spokesman said the office tried 'tougher cases' than other district attorneys, in part because of the no-plea-bargain policy. But many lawyers and judges in the Bronx said the conviction rate in jury trials reflected the skepticism of Bronx jurors" (Waldman 1999). One proposed corrective to this apparent distortion of conviction rates is to count as convictions only those cases where prosecutors obtain a conviction (or arrange a plea of guilty) on the most serious count of an indictment (Ramos 1998).

The critical question in examining this mechanism for evaluating prosecutors is whether observed patterns of convictions, negotiated sentences, and dropped cases are informative of a prosecutor's success or failure in obtaining justice. A related question concerns whether rewarding certain outcomes more than others (e.g., convictions) encourages the prosecutor to wittingly tolerate injustice in pursuit of office. Similar problems arise in other efforts to encourage bureaucrats to pursue desired ends. The imposition of summons quotas for traffic officials, for example, might encourage them to issue questionable tickets to meet the quota and simultaneously discourage unmeasurable steps to improve public safety such as directing traffic (Diver 1980).

A Model of Prosecutorial Accountability

We consider the game between the prosecutor and her principal, in our model represented by some pivotal voter.[7] The voter uses the reward of office to encourage the prosecutor to pursue justice by minimizing the expected loss associated with Type I and Type II errors. Our core concern is whether a citizen who conditions his voting strategy only on case outputs can motivate the prosecutor to undertake the costly search for the truth about a defendant's guilt and subsequently pursue appropriate punishment for the guilty.[8] Initially, the prosecutor must rely on the evidence available to her from earlier stages of the criminal investigation process to evaluate a defendant's guilt. She may use this initial evaluation of guilt and the likelihood of success at trial to decide whether or not to proceed further and may invest additional time and effort to reduce her uncertainty about a defendant's guilt.

Our model employs two important assumptions. First, we do not explicitly consider the entry decision made by challengers in district/county attorney elections. Rather, the public simply decides whether to retain an incumbent prosecutor. Challenger entry is treated purely as a consequence of incumbent performance. Second, prosecutors must share exculpatory evidence with the defense. We readily acknowledge that prosecutors sometimes withhold evidence. Doing so, however, is a highly risky strategy. The prosecutor might lose at trial should the defense access the withheld information by other means or suffer the humiliation of a dismissal if the suppression is detected. Convicted felons in some states will be guaranteed a retrial if the district attorney is detected withholding evidence. Lastly, the prosecutor could face charges of suborning perjury or obstructing justice and could be disbarred for ethics violations. We derive effective sanctions to deter corrupt prosecutors below.

The Structure of the Game

Figure 1 displays the structure of the simplest version of the full game between the prosecutor and the voter. The model, one of static mechanism design, has five stages. First, Nature determines the true guilt of the defendant with prior probability p. At this point, neither player observes the defendant's actual guilt. Nature also produces a signal $x_0 \in [0,1]$. The prosecutor combines her prior belief p with the information contained in the signal to arrive at an updated quantity, x, which represents both the posterior probability that the defendant is actually guilty and the probability that *absent further investigation* the defendant would be convicted at trial. (The logic behind treating the prior belief and case-specific information as distinct quantities is explained below.) We consider separately the situation in which the voter observes the case-specific information necessary to calculate x and one in which he knows only the distribution of case-specific information. Second, the voter derives a schedule of electoral rewards for the prosecutor consisting of three components: ϕ_c, ϕ_a, and ϕ_d. ϕ_c is the probability the voter will reelect the prosecutor if she secures a conviction. Likewise, ϕ_a is the probability of reelection given an acquittal and ϕ_d is the probability of reelection if the prosecutor drops the case.[9]

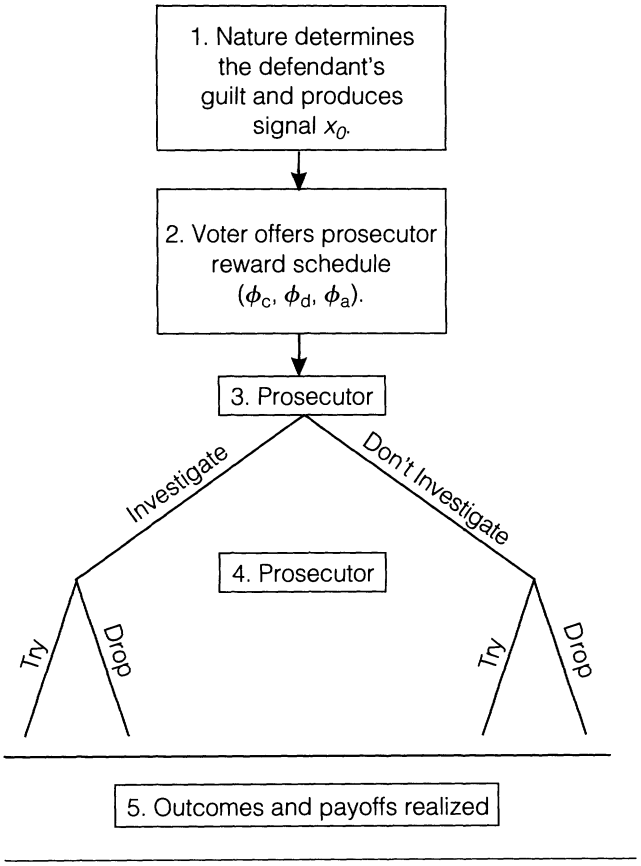
In the third stage, the prosecutor chooses whether or not to conduct the additional investigation that reveals the defendant's true guilt or innocence. If she does not investigate further she proceeds to the fourth stage,

[7]The pivotal voter is not necessarily the median. Voter strategies in our model are probabilistic, which confounds the median voter theorem even when ideology is unidimensional.

[8]Our model of the prosecutor's investigative role reflects the framework proposed in Miceli 1990.

[9]Readers may initially object to our formalization of the voter-prosecutor relationship on the grounds that the voter may not be able to credibly commit to the reward schedule after observing the prosecutor's behavior (Maskin and Moore 1999; Fudenberg and Tirole 1990). In the current setting, however, using the vote in such a way is credible. All prosecutors in the model are identical, caring only about the benefit of holding office and the costs of investigation and trial. In an election, each will claim to be the hardest worker, and all will promise to appropriately punish the guilty and protect the innocent. Because of this equivalence, the voter loses nothing by discarding an incumbent prosecutor to uphold a set of incentives, and doing so weakly dominates all other strategies. The adverse selection problem in district and county attorney elections is surely an interesting one, but it is beyond the scope of the current analysis.

FIGURE 1 The Elected Prosecutor Game



where she can drop the case or proceed to trial (an expanded version of the model allows the prosecutor to arrange a plea bargain). If she chooses a trial, the defendant is convicted with probability x and acquitted with probability $1-x$. If she investigates further, she pays the cost $e \geq 0$ for gathering the additional information but observes the true guilt or innocence of the defendant. Again, she enters the fourth stage of the game, this time fully informed of the defendant's guilt. Now, however, the outcome of the trial is certain because of the prosecutor's unimpeachable evidence. If the defendant is truly innocent the trial will end in an acquittal. Likewise, if the defendant is truly guilty he will be convicted if the case goes to trial.[10] Going to trial costs the prosecutor $c \geq 0$. In the final stage, the prosecutor and the voter receive their payoffs based on the outcome of the prosecution, the outcome of the election, and the true innocence or guilt of the defendant.

[10]Although a prosecutor does not have to use evidence that confirms a defendant's guilt, it will always be in her best interest to do so in equilibrium.

The "Economizing Guardian" Prosecutor against Nature

We first examine a decision model of prosecutor behavior. The purpose of this section is purely expository, so we make several simplifications. Most obviously, the voter does not participate, and the prosecutor is therefore not concerned with retaining office. In other words, we temporarily ignore the second stage of the game, and payoffs to the prosecutor are not conditioned by voter behavior. We also assume for the moment that the trial is costless, so that a prosecutor who discovers true guilt will have no incentive to avoid trial.[11] We wish to determine when the prosecutor will find it in her interest to conduct the further investigation necessary to reveal the truth. First, however, we must elaborate on her preferences. The prosecutor pays a cost (in expectation) from making mistakes associated with not gathering additional information. Mistakes can occur from convicting the innocent (Type I errors), or from letting the guilty escape punishment (Type II errors). Type I errors may occur when the prosecutor goes to trial without gathering additional information. Given that she follows this path, the probability of this kind of mistake is the probability the defendant is actually innocent $(1-x)$ multiplied by the probability that he is convicted (x). Type II errors can occur either when the prosecutor drops the case (if she fails to gather additional information or finds out that the defendant is guilty) or when she goes to trial unprepared and a guilty person is acquitted. In the former case, the probability of a Type II error is x if the prosecutor has not investigated further. In the latter case, the probability is $x(1-x)$, the same likelihood that a Type I error would occur if the uninformed prosecutor went to trial.

If a Type II error is committed, the prosecutor pays a penalty of m, which we normalize to one. If a Type I error is made, the prosecutor pays αm. She may thus care more about convicting the innocent than acquitting the guilty (in which case $\alpha > 1$), or more about acquitting the guilty than convicting the innocent ($\alpha < 1$). The meaning of the parameter α is best understood with reference to a familiar adage: "It is better to let α guilty persons go free than to convict one innocent person." Throughout this article we make the assumption that $\alpha \geq 1$.[12]

We are now in a position to specify the prosecutor's expected utility for different actions. Note that because

[11]Incorporating the trial cost drastically complicates the mathematics while producing no fundamental changes in the results.

[12]Allowing $\alpha < 1$ complicates the following discussion but does not substantially alter our findings.

the cost of Type II errors exceeds zero, the prosecutor will go to trial (and obtain a conviction) upon finding out the defendant is truly guilty and drop the case (or go to trial and obtains an acquittal) if the defendant is found to be truly innocent.

$$EU(\text{investigate}) = -e \quad (1a)$$
$$EU(\text{drop}|\text{do not investigate}) = -x \quad (1b)$$
$$EU(\text{try}|\text{do not investigate}) = -x(1-x)(1+\alpha) \quad (1c)$$

Under what conditions will the prosecutor investigate further to reveal the truth? First, we examine the decision of the prosecutor who has not gathered additional information whether to try or drop a case. This "partially informed" prosecutor is indifferent between these two actions when her posterior $x = \alpha/(1+\alpha)$. We will call this quantity x^*. If x is less than x^*, the partially informed prosecutor would simply drop the case. However, she may still find it in her best interest to investigate further, even if she would drop the case absent additional information. Specifically, the prosecutor will conduct further investigation when (1a) is greater than (1b). In other words, if $x < x^*$, investigate when $x > e$. Of course, for the prosecutor to ever "seek the truth" when x falls below x^*, e must also be smaller than x^*.

Consider next the situation where $x > x^*$ and the uninformed prosecutor would prefer to go to trial. In this setting, the prosecutor will investigate further when (1a) exceeds (1c). This occurs when

$$x < \frac{1}{2} + \sqrt{\frac{1}{4} - \frac{e}{1+\alpha}}. \quad (2)$$

Note that we have eliminated the second root of the quadratic.[13] For the prosecutor ever to seek additional information when $x > x^*$, it must be the case that the right hand side of equation (2) exceeds x^*. Conveniently, this is true when $e < x^*$, the same condition as when $x < x^*$.

The following decision rules therefore dictate play for the prosecutor: If $e > x^*$, never seek additional information, drop the case when $x < x^*$, and go to trial when $x > x^*$. If $e \leq x^*$, investigate when $e < x < 1/2 + \sqrt{1/4 - e/(1+\alpha)}$. If $x < e$, drop the case. If $x > 1/2 + \sqrt{1/4 - e/(1+\alpha)}$, try the case without gathering additional information. The comparative statics for this problem are straightforward. As the cost of investigation increases, the range of situations in which the prosecutor gathers information shrinks, regardless of what side of x^* the posterior x falls on. Also, as α (the relative cost of accidentally convicting the innocent) increases, the prosecutor gathers information for a larger range of xs and the threshold x^* increases. In other words, if the relative cost of making a Type I error increases, the naive prosecutor will be less likely to go to trial AND the returns to investigating will be higher.

[13]The second root may be eliminated because if $\alpha \geq 1$ then $x^* \geq \frac{1}{2}$. The second root would never exceed $\frac{1}{2}$.

The Elected Prosecutor Game with a Partially Informed Public

Next, we consider the full game where the voter must evaluate the prosecutor with only limited information about her behavior. The prosecutor in this game is "amoral." She cares only about the benefit of holding office (normalized to one) and the costs of her investigative efforts (e) and a possible trial (c). In this model, the prosecutor has no policy concerns about convicting the innocent or acquitting the guilty. The voter, like the prosecutor in the decision problem just described, however, does have concerns about miscarriages of justice. He incurs a cost of αm for a Type I error and m for a Type II error. We normalize m to one as above, because the voter's utility need not fall on the same scale as the prosecutor's.

Now the voter must decide what reward to give the prosecutor based on her observed performance. Here we assume that the voter observes the posterior x and either a conviction, an acquittal, or a dropped case. (In the next section we relax the assumption that the voter observes x.) One can think of x in this context as embodying the information revealed in the news media when the defendant is arrested, arraigned, or indicted. The problem for the voter is that he does not observe whether the prosecutor expended the effort necessary to determine the defendant's true guilt or innocence. A "lazy prosecutor" might accidentally convict the innocent or let the guilty go free. The voter's problem, then, is one of mechanism design: What incentives vis-a-vis the promise of reelection will induce the prosecutor to learn the truth and then pursue justice?

The prosecutor's expected utility must incorporate the voter's tendered electoral reward schedule $(\phi_c(x), \phi_a(x), \phi_d(x))$ (the probability of reelection given signal x and, respectively, an observed conviction, an observed acquittal, and an observed dropped case). For convenience, we omit the argument (x) in this section. Here the voter must employ two constraints. First, ϕ_d must be less than $\phi_c - c$ for all x. This restriction guarantees that if the prosecutor finds out the defendant is truly guilty, she will proceed to trial and convict him. Second, given the first restriction, ϕ_d must be greater than ϕ_a for

all x. If this were not the case, the prosecutor would always go to trial without gathering information. Gambling in court would guarantee a better payoff than learning the truth.[14] Both constraints imply that for the game not to end trivially with the prosecutor always dropping the case, c must not exceed ϕ_c. The prosecutor's expected utility for different actions may be describe as follows:

$$EU(\text{investigate}) = x(\phi_c - c) + (1-x)\phi_d - e \quad (3a)$$

$$EU(\text{drop|don't investigate}) = \phi_d \quad (3b)$$

$$EU(\text{try|don't investigate}) = x\phi_c + (1-x)\phi_a - c \quad (3c)$$

Equation (3a) relies on the fact that x represents the probability that further investigation will show the defendant is actually guilty. The prosecutor who learns true guilt will proceed to trial (at cost c) because $\phi_c - c > \phi_d$ and obtain a certain conviction. Likewise, $1-x$ is the probability that further investigation will reveal the defendant is actually innocent. Given that eventuality, the prosecutor will drop the case because $\phi_d > \phi_a$. Equation (3b) is straightforward. Equation (3c) relies on the fact that x is also the probability the prosecutor will prevail in court if she does not investigate further and $1-x$ is the probability she will lose.

Consider the prosecutor who does not gather additional information. She is indifferent between trying and dropping a case when

$$x = \frac{c + \phi_d - \phi_a}{\phi_c - \phi_a} \equiv x'^*. \quad (4)$$

If $x < x'^*$, an uninformed prosecutor would drop the case. In this situation, she will choose to investigate when (3a) exceeds (3b). This occurs when $x > e/(\phi_c - \phi_d - c)$. Given $x < x'^*$, the prosecutor will only ever investigate if e falls below a critical value. This new requirement is

$$e < \frac{(\phi_d - \phi_a + c)(\phi_c - \phi_d - c)}{\phi_c - \phi_a} \quad (5)$$

When $x > x'^*$, the prosecutor will investigate when (3a) is greater than (3c). This occurs when $x < 1 - e/(\phi_d - \phi_a + c)$. Given $x > x'^*$, it turns out that the constraint that must be met in order for the prosecutor ever to conduct further investigation is identical to the one in (5). Results in the appendix show that the constraint is made less restrictive by increasing ϕ_c, decreasing ϕ_a, and increasing ϕ_d when e falls below $(\phi_c + \phi_a - 2c)/2$, and decreasing ϕ_d when e lies above this quantity.

The voter's problem may be expressed as follows. Choose a triple (ϕ_c, ϕ_d, ϕ_a) to satisfy:

$$\frac{e}{\phi_c - \phi_d - c} < x < 1 - \frac{e}{\phi_d - \phi_a + c}, \text{ subject to (5)}$$

$$\text{and } \phi_c - c > \phi_d > \phi_a. \quad (6)$$

As in the decision problem, we find that the prosecutor can be influenced to seek the truth for intermediate values of x. For these intermediate values, the constraint that $\phi_c - c > \phi_d$ insures that should she learn the defendant is truly guilty, the prosecutor will go to trial and obtain a conviction with certainty. The constraint $\phi_d > \phi_a$ insures that should she learn the defendant is innocent, the prosecutor will drop the case.

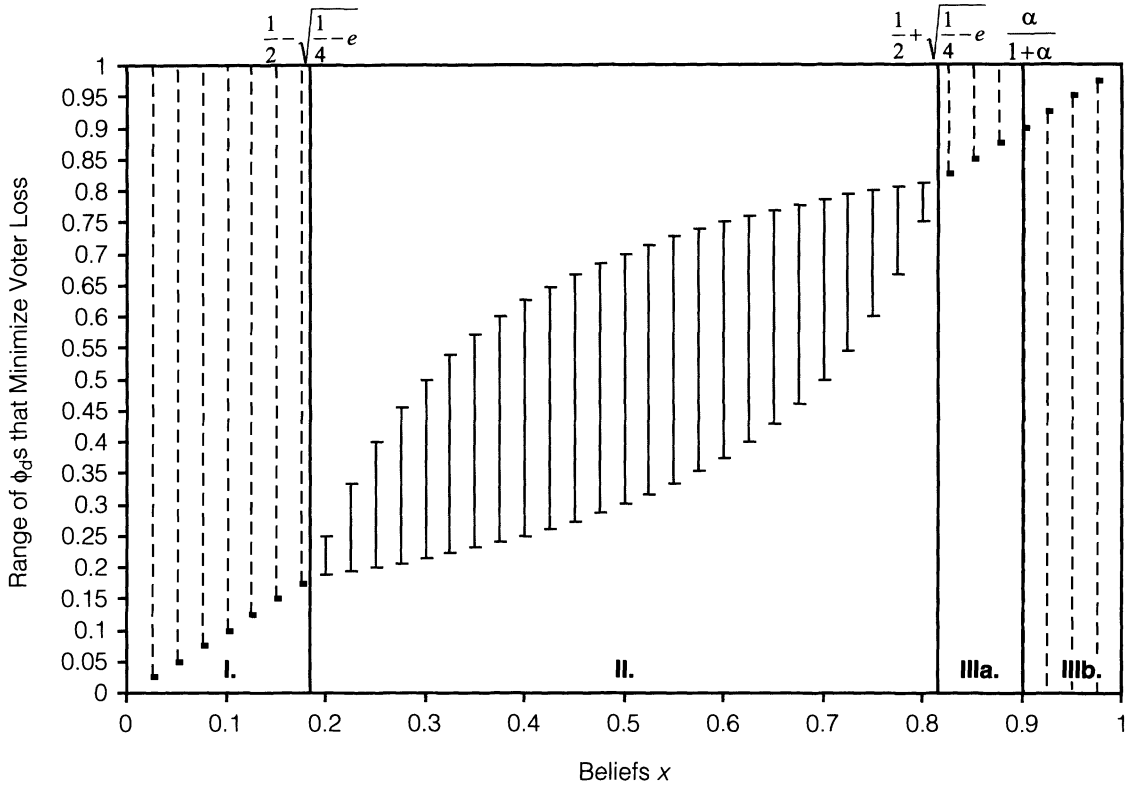
Comparative Statics. It will not be possible to formulate a reward schedule that induces the prosecutor to investigate for all xs (unless e is arbitrarily close to zero). For an intermediate range, however, the set of effective reward schedules will be characterized by a frontier of triples. Rather than fully describe the frontier, we instead examine some interesting features of the voter's set of optimal strategies. First, as x decreases, the voter must reward convictions proportionally more than dropped cases. Otherwise, the prosecutor will be encouraged to drop the case without expending the effort necessary to reveal the truth. However, regardless of the value of x, *the voter is never hurt by choosing always to reelect the prosecutor who secures a conviction* (i.e., $\phi_c(x) = 1 \forall x$).[15] Doing so simply reduces the range of cases the prosecutor would ordinarily drop without investigation, and increases the range of cases the prosecutor expends effort learning more about. The strategy of reelecting with certainty in the event of a conviction does not hurt the voter and is fully independent of both his beliefs about actual guilt and his preferences about criminal justice policy.

By the same logic, *the voter is no worse off never reelecting given an observed acquittal* (i.e. $\phi_a(x) = 0 \forall x$). This is important for two reasons. First, acquittal is the only outcome that fully reveals the prosecutor's shirking behavior in this version of the model. Second, because ϕ_d must fall between ϕ_a and ϕ_c, setting $\phi_a = 0$ potentially improves the power of the voter's incentive scheme

[14]Note that these constraints are not exogenous, but are derived from the voter's optimal strategy. Violating these constraints always increases the voter's loss.

[15]Recall that increasing ϕ_c (and decreasing ϕ_a) has the added benefit of making the effort constraint in (5) less restrictive.

FIGURE 2 Optimal Voter Rewards to Prosecutor for Dropping a Case (ϕ_d) for Different Beliefs x (Given Voters Have Trial-specific Information, $e = 0.15$, $c = 0.05$, $\alpha = 9$)



In region I, the voter fails to induce the prosecutor to gather additional information, and proposes a reward for dropping the case high enough to induce her to do so. In region II, a range of rewards for dropping will induce the prosecutor to learn the truth. In region III, the voter again fails to induce effort. In IIIa, he proposes a reward for dropping high enough to spur her to do so, and in IIIb, low enough to get her to go to trial.

by widening the range of acceptable values for ϕ_d.[16] Assuming the voter sets ϕ_c to one and ϕ_a to zero, we may restrict our attention to ϕ_d. First, note that the constraint in (5) reduces to $e < (\phi_d + c)(1 - \phi_d - c)$ under these conditions. Solving for ϕ_d, we find that to satisfy the constraint, the voter must choose ϕ_d such that

$$\frac{1}{2} - c - \sqrt{\frac{1}{4} - e} < \phi_d < \frac{1}{2} - c + \sqrt{\frac{1}{4} - e}. \qquad (7)$$

As the cost of trial rises, the voter must reward dropped cases progressively less to induce the prosecutor to expend effort. Note that there is now an explicit upper bound on the value of e. If the cost of investigating is greater than a quarter of the benefit of retaining office, the prosecutor never gathers information. Given $e < 1/4$, the voter must choose a ϕ_d within the range specified in (7). Otherwise, the prosecutor will never learn the truth, irrespective of x. As the cost of effort approaches 1/4, the region in which inducement is possible shrinks around $x = 0.5 - c$.

Figure 2 displays, for a given effort cost ($e = 0.15$), trial cost ($c = 0.05$), and voter ideology ($\alpha = 9$), the range of ϕ_ds that maximize the voter's utility. (There is nothing unique about this set of parameter values.) In the middle region (II), a range of ϕ_ds exist that will satisfy equation (6) given x. Note that the voter cannot convince the prosecutor to investigate for more extreme values of x (those in regions I and III). Given that the voter fails to induce effort for these values, she, like the prosecutor in the decision model, prefers that her uninformed agent drop cases when $x < \alpha/(1+\alpha)$, and try when x exceeds this amount. Note that if $\phi_c = 1$ and $\phi_a = 0$, the uninformed prosecutor's decision rule from equation (4) reduces to "Drop if $x < \phi_d + c$." If x falls below $\alpha/(1+\alpha)$ and the prosecutor cannot be induced to

[16] In practice, for the range of xs where the voter can induce the prosecutor to seek out the truth, a variety of ϕ_as greater than zero will induce the prosecutor to learn the truth. Strictly speaking, these are Pareto improving in that they increase the attractiveness of the reward offer to the prosecutor without hurting the voter. However, for this range of xs, variation in ϕ_a is moot, as acquittals will never be observed in equilibrium.

learn the truth, the voter prefers she drop the case. This behavior is induced by setting $\phi_d > x - c$. This always occurs in region I, because its right boundary (which some algebra reveals to be $1/2 - \sqrt{1/4 - e}$) falls below 1/2, and $\alpha/(1+\alpha) \geq 1/2$ by assumption. Given a sufficiently high α, the voter may also want the uninformed prosecutor to drop cases in part of region III (in the figure, this subregion is labeled IIIa). When x exceeds $\alpha/(1+\alpha)$, the voter prefers that the uninformed prosecutor goes to trial. She can induce this by setting $\phi_d < x - c$, as occurs in region IIIb. Additional calculation reveals that a partition of region III as depicted in the figure will only occur when $e > \alpha/(1+\alpha)^2$. When e falls below this value, all of region III will resemble IIIb.

Reducing the Voter's Information

In the previous section, we assumed that both the voter and the prosecutor observe the case-specific signal $x_\circ$ and used it to calculate a posterior x. We now consider the instance in which the prosecutor observes the case-specific information, but the voter does not. The voter's knowledge of $x_\circ$ is instead characterized by a prior distribution, $f(x_\circ)$. One can think of this distribution as a mixture of two separate distributions, one that generates signals from the distribution $f_g(x_\circ)$ given the defendant is actually guilty (with prior guilt probability p), and one that produces signals from the distribution $f_i(x_\circ)$ given the defendant is actually innocent (with probability $1-p$), such that $f(x_\circ) = pf_g(x_\circ) + (1-p)f_i(x_\circ)$. These distributions and the quantity p are known to both the prosecutor and the voter, so the prosecutor's posterior estimate of guilt (and the likelihood of conviction) given the observed signal, per Bayes' Rule, is simply $x = \Pr(\text{guilty}|x_\circ) = pf_g(x_\circ)/f(x_\circ)$.

Now, the voter's objective is to minimize the expected loss associated with Type I and Type II errors. He accomplishes this by proposing a reward schedule, the triple (ϕ_c, ϕ_d, ϕ_a) that minimizes expected loss:

$$EL_{voter} = \int_\circ^{\frac{e}{\phi_c - \phi_d - c}} x f(x_\circ) dx_\circ + \int_{1-\frac{e}{\phi_d - \phi_a + c}}^{1} x(1-x)(1+\alpha) f(x_\circ) dx_\circ,$$

given $x = pf_g(x_\circ)/f(x_\circ)$, and subject to (5)

$$\text{and } \phi_c - c > \phi_d > \phi_a. \tag{8}$$

(Note that because the voter cannot observe the case specific signal, strategies are no longer conditional on it.) The first integral represents the expected loss to the voter associated with the Type II errors that might occur when the prosecutor drops a case without gathering information. The second integral represents the expected loss that comes from Type I and Type II errors, either of which might occur should a prosecutor bring a case to trial without gathering additional information.

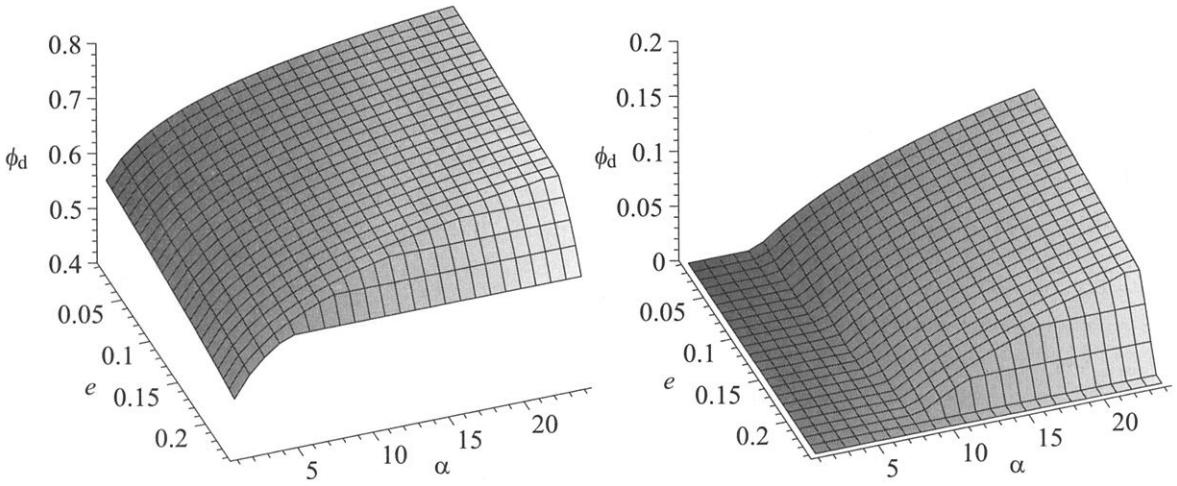
Recall from the previous section that the region for which the prosecutor gathers information is always expanded by increasing ϕ_c and by decreasing ϕ_a. Therefore, if the voter lacks trial-specific information he will by necessity set $\phi_c = 1$ and $\phi_a = 0$ to maximize the span of the region. This greatly simplifies both the objective function and the first constraint. Assume, for purposes of clarification, the probability density function of the signal distribution given guilt is increasing right-triangular on the interval $[0,1]$, $f_g(x_\circ) = 2x_\circ$; and the pdf of the signal given innocence is decreasing right-triangular, $f_i(x_\circ) = 2 - 2x$. If $p = 0.5$, then $f(x_\circ)$ is uniform and $x = x_\circ$. Given this parameterization, the voter's objective simplifies to

$$EL_{voter} = \frac{e^2}{2(1-\phi_d - c)^2} + (1+\alpha)\left[\frac{1}{6} + \frac{(\phi_d + c - e)^3}{3(\phi_d + c)^3} - \frac{(\phi_d + c - e)^2}{2(\phi_d + c)^2}\right]. \tag{9}$$

Unfortunately, there is no known set of solutions to the objective function's first order condition. However, simulation across the range of feasible values for e, c, and α reveals that within the specified constraints, *EL* always appears to have a unique minimum. Figure 3 displays how the ϕ_d that minimizes equation (9) varies as a function of α and e in two settings. In the first setting, depicted in the left panel, trial is costless. As the voter's α increases, he increases the rewards to dropping the case to minimize the occurrence of Type I errors, accepting the fact that more guilty defendants will be set free as a consequence. At the same time, as the cost of investigation increases, the voter's optimal ϕ_d falls. For sufficiently high values of e, when a voter's α is sufficiently large, his ϕ_d reaches its upper constraint, $0.5 + \sqrt{1/4 - e}$.

In the right panel, optimal ϕ_ds are calculated in the case when the cost of trial is high, $c = 0.65$. The figure is at first glance similar to that on the left. The chief distinction is that now, the costliness of the trial has necessitated lowering ϕ_d (note the scale change on the vertical axis). Also, for a range of combinations of (e, α), the voter's optimal strategy absent the constraint $0 \leq \phi_a < \phi_d$ would necessitate setting ϕ_d to a negative quantity. With the

FIGURE 3 Strategies for the Uninformed Voter: Optimal Electoral Rewards to Prosecutors Who Drop Cases as a Function of Voter Preferences and the Cost of Investigating



In the left panel, trial is costless ($c = 0$). For high effort costs and voter liberalism, the reward for dropping cases reaches its upper constraint. In the right panel, trial is costly ($c = 0.65$). When voters are conservative or effort is costly, the reward for dropping cases "bottoms out" just above zero.

constraint in place, ϕ_d "bottoms out" infinitesimally above zero. Finally, in a separate simulation, we considered how varying the voter's prior belief about defendant guilt around the intermediate value of $p = 0.5$ would alter his strategy. Not surprisingly, as p increases, ϕ_d decreases. Voters who believe ex ante that defendants are guilty should not reward convictions more; rather, they should reward cases concluded out of court less.

Plea Bargaining and Imperfect Investigation

The models specified in the previous sections do not permit the prosecutor to arrange a plea bargain with the defendant. This simplification is problematic, insofar as a plea bargain is the most common outcome in actual criminal cases (U.S. Department of Justice 1999). In this section, we allow the prosecutor to bargain with the defendant. The outcome of this bargain is a sentence z at or below the expected punishment associated with a trial.

First we examine the motivations of defendants. Irrespective of actual guilt, a defendant wishes to minimize his expected punishment. If the loss to the defendant associated with a maximum sentence is normalized to one, and the defendant knows the prosecutor's signal, then a risk neutral defendant would be indifferent between a sentence of x and a trial by an uninformed prosecutor, and would strictly prefer a sentence less than x. (For notational simplicity, we assume the defendant just barely prefers a sentence x to a trial with an expected sentence of x. If a trial is at all costly to the defendant, or if he is risk-averse, this is an accurate assumption.) Thus, if the prosecutor can credibly commit to a trial (see Baker and Mezzetti 2000), she will always be able to arrange a plea bargain to a sentence $z \leq x$. If the prosecutor cannot commit to try the defendant if he rejects the offered plea, the defendant should hold out for a less punitive sentence. The prosecutor's ability to credibly threaten a trial therefore depends on the voter's reward schedule, which we assume is common knowledge.

Second, we consider how voters evaluate a plea bargain. This requires relaxing an important simplifying assumption from the basic model. Specifically, if a prosecutor's investigative effort fully revealed the guilt or innocence of a defendant, then a plea bargain would reveal shirking behavior on the part of the prosecutor, and the voter could punish her accordingly. In such a case, reelection-minded prosecutors would never arrange pleas. If investigation only sometimes reveals the truth, however, then the voter will find it in his interest to reward plea-bargains in some situations. Let $\sigma \in (0,1)$ represent the probability that an investigation is revelatory. The parameter might represent the quality of the available evidence, the competence of the police aiding in the investigation, exogenous constraints on search, or a host of other factors. In any case, because investigations are imperfect, a prosecutor may not be fully informed either because she shirked or because her investigation was unfruitful.

The voter wishes to minimize both overpunishment and underpunishment. Given constant returns to scale in

the degree of these two potential errors, the voter's expected loss associated with a plea bargain to punishment z is

$$EL_{voter}(\text{Plea of } z|x) = \alpha z(1-x) + (1-z)x. \quad (10)$$

The first term represents the expected loss associated with z units of overpunishment (the individual is innocent with probability $1-x$), while the second term represents the loss corresponding to $1-z$ units of underpunishment. If the prosecutor can secure a plea $z=x$, the voter will be indifferent between an uninformed trial and a plea bargain to x. Both have an expected loss equal to $(1+\alpha)x(1-x)$. At what point would the voter prefer the prosecutor plea bargain to x or go to trial uninformed rather than drop the case outright? Given that the expected loss to the voter of a dropped case given signal x is the signal itself, the voter prefers dropping the case when

$$x < (1+\alpha)x(1-x)$$
$$0 < x < \frac{\alpha}{1+\alpha} = x^*.$$

Note that x^* is identical to the uninformed "economizing guardian" prosecutor's cutpoint in the earlier decision problem. This cutpoint holds for any $0 < z \leq x$. Below x^*, the public prefers the prosecutor drop the case to negotiating any sentence $z > 0$. Above x^*, the voter's loss is decreasing in z. Thus, if the prosecutor must arrange a plea bargain, the voter prefers she negotiate the maximum sentence the defendant will accept, $z = x$.

Let $\phi_r(z)$ represent the voter's "plea bargain response function," a mapping of a settlement outcome z to a reelection probability. $\phi_r(0)$—the reward for a "plea to zero"—is equivalent to ϕ_d in the simpler model. Below x^*, the voter can encourage the uninformed prosecutor to drop the case rather than offering a plea bargain. He accomplishes this by making $\phi_r(0)$ greater than $\phi_r(z)$ for all $z \in (0, x^*]$. The uninformed prosecutor, whose plea bargain options range from zero to x, will thus be encouraged to lower any plea offer to zero.

Above x^*, the voter wants the uninformed prosecutor to obtain the maximum possible sentence. This implies that in the range $(x^*, 1]$, the voter's plea bargain response will be increasing in z. Now we note some additional characteristics of $\phi_r(z)$. First, above x^* the voter never wants to reward the prosecutor any more for a plea bargain than her expected payoff for an uninformed trial, $x\phi_c + (1-x)\phi_a - c$. At first this may seem puzzling, given that the voter is indifferent between the uninformed trial and a plea bargain to its expected sentence. However, if the prosecutor ever prefers arranging a plea bargain to an uninformed trial, she will be tempted to offer a plea lower than x (at the voter's loss) to avoid the trial. In effect, the prosecutor's threat to a defendant of proceeding to trial rather than taking a plea less than x is not credible if there is some bargain $z < x$ for which $\phi_r(z) > x\phi_c + (1-x)\phi_a - c$. If the voter instead makes the reward for a plea bargain of z equal to the reward for the uninformed trial with $x = z$, then the uninformed prosecutor is indifferent between going to trial and settling for cases in the range above x^* (and she strictly prefers a trial to any plea $z < x$). Moreover, if $\phi_r(r) > x\phi_c + (1-x)\phi_a - c$ the voter will find it more difficult to induce the prosecutor to seek out the truth. The less attractive an uninformed trial or plea to x is, the easier it is for the voter to encourage the prosecutor to learn the truth.

It is straightforward to demonstrate that the conditions under which the prosecutor will endeavor to learn the truth and the voter's optimal strategy are *identical* to those derived in the previous section, with the exception that e must be replaced by e/σ. As long as $e/\sigma < 0.25$, the voter can induce the prosecutor to attempt an investigation for a range of cases in which the voter considers search most potentially rewarding. Just as in the simpler model, rewarding convictions and punishing acquittals by setting $\phi_c = 1$ and $\phi_a = 0$ is still optimal for any voter. Substituting, this implies that the plea bargain response function $\phi_r(z) \leq z - c \; \forall z > x^*$. Also, as α increases, e decreases, or σ increases, the reward for a dropped case, ϕ_d, increases.

In most circumstances, the support of x will be divided into five regions instead of just three. For the lowest values of x, the prosecutor will drop the case outright. In the second region, the prosecutor investigates, and drops the case if the investigation fails to produce new information. In the third, she investigates, and goes to trial uninformed if the investigation fails to reveal. In the fourth region, she simply goes to trial uninformed. In the fifth region, above x^*, she either goes to trial uninformed or, if $\phi_r(z) = z - c$, randomizes between the uninformed trial and the plea bargain. If α is sufficiently low, however, x^* may fall inside the investigation region. In that case, there will be a range of cases for which the prosecutor investigates and then potentially randomizes between trial and plea bargaining if the investigation fails to produce a more definitive signal.

The voter's indifference between plea bargains and uninformed trials is generated by two factors. The first is the assumption of constant returns to scale in the voter's expected loss from overpunishment and underpunishment. If the voter believes that punishment has diminishing returns, then his risk aversion will cause him to reward plea bargains higher than uninformed trials in

some cases. This conception of plea bargains as a risk-sharing device echoes Grossman and Katz (1983) and Reingenaum (1988). Likewise, if the voter, and not just the prosecutor, bears a cost for going to trial, he will also encourage the prosecutor to settle rather than going to trial uninformed (Landes 1971; Adelstein 1978). There is a shadow cost associated with both of these possibilities, however, and that comes in the prosecutor's ability to commit to a trial if the defendant refuses a particular plea agreement. The prosecutor will be encouraged by the higher plea bargain response function to arrange more lenient sentences rather than go to trial. Note, however, that as long as the voter is willing to pay the trial cost to insure a *truly guilty* person receives the maximum sentence, our core results do not change.

Discussion

Our analysis began with two related puzzles. First, why do voters apparently rely on conviction rates to assess prosecutorial performance? One common answer, that voters are tough on crime and demand convictions for purposes of deterrence, contains an embedded assumption that the public will tolerate convicting the innocent. The model presented here suggests that rewarding convictions is an optimal strategy for even the most liberal voters. Readers who object to our characterization of public preferences regarding criminal justice will note that allowing voters to enjoy some intrinsic benefit from convictions irrespective of actual guilt or innocence would only strengthen this result. Second, does rewarding convictions and punishing acquittals distort the prosecutor's incentives in such a way as to subvert justice? Our initial suspicion was that doing so would encourage prosecutors to pad their records with easy wins, and take cases they knew to be dubious to trial if they believed they had a good chance of prevailing in court. The analysis, however, demonstrates that these fears may be overstated. The tendency of prosecutors to "go for the easy win" is sometimes unavoidable, but we demonstrate that rewarding convictions does not encourage such behavior. Rather, it encourages prosecutors to investigate marginal cases they would otherwise drop or try blindly. To the extent that a voter's attitudes and beliefs influence his voting strategy, they are reflected in the manner in which he rewards or punishes the prosecutor's *outside-the-courtroom* behavior. In our model, this is captured most fundamentally by the likelihood the voter reelects given he observes a dropped case or plea-bargain.

Refinements and Qualifications

Defendant guilt and case quality. Some scholars have argued that case quality largely determines whether a prosecutor proceeds to trial (Forst 1995; Albonetti 1987). In this article, we have treated the likelihood of conviction and the likelihood of guilt as identical. If the two are separate quantities, however, rewarding convictions could conceivably encourage prosecutors to invest effort in improving the former without learning about the latter. One may approach this problem in several ways.

First, we could consider the means by which, apart from seeking the truth, the prosecutor can boost her chances of prevailing in court. For example, the testimony of eyewitnesses may vastly improve the prospect of conviction, despite mounting evidence of its unreliability (Loftus 1979; Wells and Bradfield 1998). A prosecutor familiar with this research might invest effort in securing eyewitnesses, even though she believes them to be unreliable. In general, elections are too blunt a mechanism to prevent prosecutors from engaging in such behavior—if prosecutors are rewarded based on outputs, they will do their best to generate those outputs. However, the fact that some agency loss will inevitably occur through this behavior need not upset our basic results. Put another way, an agent's ability to manipulate a monitoring technology may detract from the system, but will not necessarily warrant the principal's rejecting it outright.

The voter who is unaware of potential manipulation will behave as though case quality and the likelihood of conviction were synonymous. If he is cognizant of such efforts, the voter will simply recognize that it is easier for the prosecutor to obtain a conviction than previously thought. Earlier, we assumed the probability of conviction without further investigation was x. If prosecutors can artificially inflate case quality some amount ε above the probability of guilt x, then the voter will substitute $x+\varepsilon$ for x in his estimation of the prosecutor's expected payoff for an uninformed trial. As long as investigation promises the *possibility* of revealing true guilt or innocence (and sanctions for withholding exculpatory evidence are in place), there will be no effect on the voter's rewards for convictions and acquittals. The practical effect will instead be to raise the reward for dropped cases (and possibly plea bargains).

Compensating in this manner is more challenging if certain defendants are easier (or harder) to convict than others. The voter's problem becomes one of appropriately weighing cases in which the optimal rewards for the prosecutor varies across case types. Imagine two defendants are guilty with equal probability. Only one defendant, however, can afford to hire a competent defense at-

torney. Ceteris paribus, the wealthy defendant is harder to convict than the poor one. If the voter offers a reward schedule sufficient to make the prosecutor investigate the wealthy defendant, he may inadvertently encourage her to railroad the poor one. By the same token, if the voter's strategy creates incentives to treat the poor defendant fairly, the prosecutor may simply drop the weaker case against the wealthy defendant. Which does the voter prefer? It depends on both his relative weighting of error costs (α) and beliefs about the distribution of case types. If α is high or poor defendants are common, letting a few wealthy defendants go free may be preferable to convicting the innocent.

Vengeance, prejudice, and the voter. Voters are not blindly retributive in our model, seeking punishment irrespective of actual guilt or innocence. There are two plausible criticisms of this conception. First, it ignores sociological factors, such as the impact of a defendant's race, on citizen preferences about the outcome of individual cases. One might believe, for example, that a white supremacist simply desires to incarcerate as many black men as possible. Second, we do not explicitly consider the attitude, held by voters and prosecutors alike, that a criminal defendant, even if he is innocent of the crime of which he is currently accused, is probably "guilty of something." Far from disputing the veracity of these points, we consider them to be plausible descriptions of individual attitudes. We believe, however, that prejudice on the part of the voter or prosecutor is better understood with reference to beliefs than primitive preferences. In other words, to the extent that the racist desires to see black men incarcerated, he does so because he believes them more likely to be guilty of the crime of which they have been accused (or of other crimes of which they have not been accused). These beliefs are best captured by the voter's prior beliefs about guilt. As we have demonstrated above, the prejudiced voter does not reward convictions any more than the nonprejudiced voter does. Instead, he rewards resolutions occurring outside the courtroom less.

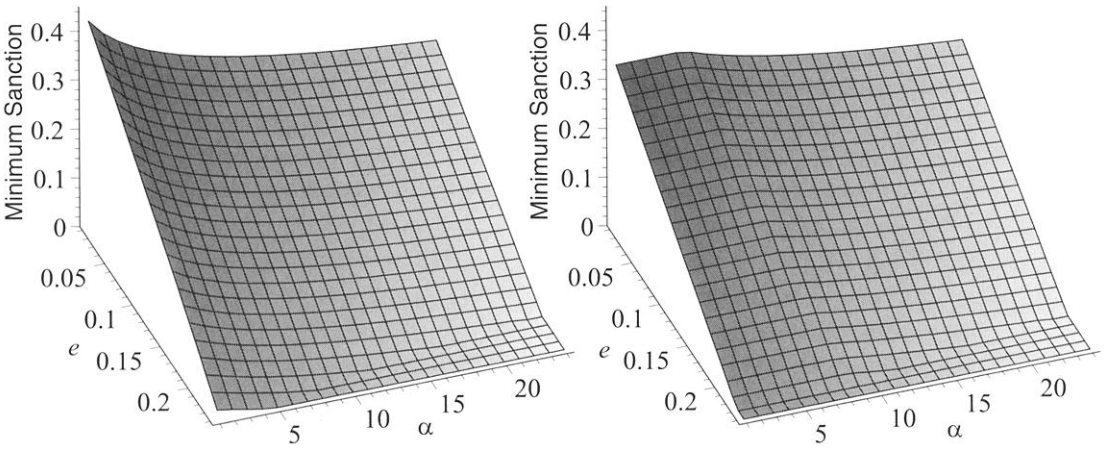
Remoralizing the prosecutor. We assume in our model that the district attorney is interested only in the discomfort of working and the rewards of reelection. A more nuanced approach would give the prosecutor a conscience, i.e., preferences for justice. At first glance, this refinement would not substantially alter our findings. A prosecutor who is concerned about error would be easier to persuade to undertake the costly search for the truth than an amoral one because she herself cares about making mistakes. However, an adverse selection problem might emerge in which the voter and prosecutor weigh the relative cost of Type I and Type II errors differently. Suppose the voter's α exceeded the prosecutor's and the voter didn't observe case-specific information. In that case, the prosecutor's own preferences for proceeding to trial would weaken the effectiveness of the voter's promise of reelection given an observed dropped case.

Institutional Implications

Sanctions for prosecutorial misconduct. Our model hinges on the ability of defense counsel to obtain exculpatory evidence uncovered by the prosecutor during her investigation. As discussed above, a variety of formal and informal punishments exist to prevent prosecutors from withholding such information. Are these sufficient? Ignoring the implications of wrongfully punishing prosecutors, it is possible to calculate the minimum sanction that will induce the prosecutor to share exculpatory evidence. If the prosecutor is risk neutral, that sanction will just exceed the rewards to withholding evidence *when doing so would be most tempting*, divided by the probability of detection.

Assume that voters are indifferent between uninformed trials and plea bargains to their expected sentences. We are concerned with the case in which the prosecutor with initial signal x learns the defendant is truly innocent but proceeds to trial with the original evidence. The potential reward for suppression is the difference between the expected benefit of a trial and that of a dropped case. Given $\phi_c = 1$ and $\phi_a = 0$, this difference is $x - c - \phi_d$. Consider the case in which the voter observes case-specific information. One obvious way to make suppression unpalatable to the prosecutor is to make trials costly. Doing so does not restrict the range of cases over which the prosecutor gathers information. Suppose, however, that manipulating trial costs is not an option. If the voter gives the *minimum* ϕ_d necessary to induce the prosecutor to investigate (which equals $(e + cx - c)/(1 - x)$ over the range in which investigation can be induced), it turns out that withholding is most tempting when $x = 1 - \sqrt{e}$. Substituting that quantity into the potential reward, the minimal effective sanction becomes $\left(\sqrt{e} - 2e\right)\Big/\sqrt{e}$, divided by the probability of detection. This quantity is always positive (and thus the sanction is always necessary) over the domain of permissible es. If the voter gives the *maximum* ϕ_d necessary to induce an investigation when this is possible (which equals $(x - xc - e)/x$), then the threat of suppressed evidence is not an issue. Even in the case where trial is costless, the value to the attorney of suppressing evidence is *always negative* given

FIGURE 4 Deterring Prosecutor Misconduct: Minimally Effective Sanctions for Suppressing Exculpatory Evidence When Voters Lack Case-Specific Information



In the left panel, trial is costless (c = 0). In the right, it is costly (c = 0.65).

that an investigation has taken place. In other words, a sanctioning mechanism will not be necessary if the voter rewards the prosecutor with the maximum ϕ_d necessary to induce an investigation.

Next consider the situation in which the voter lacks case-specific information. The benefit to withholding is still $x - c - \phi_d$, where ϕ_d is now that derived optimally from (8), and not conditioned on x. Suppression is most tempting, then, at the maximum x for which the prosecutor would gather information. As derived above, this occurs at $x = 1 - e/(\phi_d + c)$. Figure 4 displays minimally effective sanctions for withholding evidence as a function of the cost of investigative effort and voter preferences, given the parameters of the simulation above and perfect detection of prosecutor misconduct. As the reward for dropping cases increases (when effort costs or voter liberalism increases), the sanctions can be less harsh because the relative payoff for misconduct decreases. An increase in the cost of the trial necessitates lowering the reward for dropped cases. By itself, the lower reward would increase the attractiveness of withholding evidence, but this effect is more than made up for by the prosecutor's increased desire to avoid trial. The net result of a costly trial, then, is to reduce the minimally effective sanction necessary to deter evidence suppression.

If the detection of misconduct is certain, then effective penalties for misconduct need not be exorbitant. Given that detection is almost certainly both difficult and costly, however, appropriate penalties may have to exceed by many times the value to the prosecutor of holding office.

Another approach to sanctions is to assume that they are insufficient and examine voter behavior in light of that fact. For example, enforcement costs may be exorbitant. If penalties are inadequate, then the voter *may*, under certain circumstances, lower his rewards for convictions below $\phi_c = 1$, and raise their rewards for acquittals above $\phi_a = 0$. Suppose there is an exogenous expected sanction s below the minimally effective one derived above. Withholding exculpatory evidence obtained during an investigation and proceeding with the original evidence x gives the prosecutor an expected payoff of $x\phi_c + (1-x)\phi_a - c - s$. Given she has investigated and determined the defendant is innocent, she will withhold that evidence rather than drop the case when

$$x\phi_c + (1-x)\phi_a - c - s > \phi_d$$
$$x > \frac{c + s + \phi_d - \phi_a}{\phi_c - \phi_a} \equiv x_s. \tag{11}$$

If sanctions are insufficient, x_s will lie within the investigation region. For some constellations of parameters, the range of cases in which the prosecutor withholds evidence may be reduced by *decreasing* ϕ_c and *increasing* ϕ_a. Thus, the voter's objective function must be recalibrated to account for the Type I errors that may occur when the prosecutor withholds evidence, and weigh those against the Type II errors that result from reducing ϕ_e. Two observations are in order. First, the voter would prefer the prosecutor investigate and withhold evidence than go to trial uninformed. The former action carries with it the possibility of Type I errors, while the latter is

associated with both Type I and Type II errors. Both occur with probability $x(1-x)$.

Second, to remove the prosecutor's temptation to withhold, sanctions must be larger when her "competence" (σ) is larger and the cost of investigation (e) is smaller. In other words, *withholding exculpatory evidence is more of a problem when investigations are effective and inexpensive for the prosecutor*—not, as one might believe a priori, when the prosecutor is led to desperate measures by troubled investigations. A small σ and large e push x_s outside the investigation region. In those cases, the prosecutor never gets the chance to withhold evidence, simply proceeding to trial uninformed. This outcome, while undesirable, is not exacerbated by insufficient penalties.

The appropriateness (and insufficiency) of prosecutorial elections. When examining the usefulness of elections as mechanisms to induce justice-seeking behavior on the part of the prosecutor, it is appropriate to compare elected prosecutors not against a utopian ideal, but rather against alternative possible arrangements. One such arrangement would make the prosecutor a political appointee of another elected official. Rhode Island and Delaware employ such a mechanism (the chief prosecuting attorney in each state serves under an elected attorney general). If a governor can remove these prosecutors from office, then none of the results of our model change. The governor can use the threat of removal in exactly the same fashion as the pivotal voter would. Local elections of criminal prosecutors, like local elections of any official, allow communities to induce behavior by prosecutors closer to their own preferences. Another possibility is to employ tenured civil servants as prosecutors. If a prosecutor were insulated from hiring or firing, then only her own professionalism would encourage her to seek out the truth and appropriately punish the guilty and protect the innocent. If the degree of professionalism is low, however, the public's loss could be exacerbated. Not only would the prosecutor in this circumstance rarely reduce uncertainty through investigation or proceed to trial, but her lack of a credible trial threat would permit even those defendants who were almost certainly guilty to obtain overly lenient (from the voter's perspective) settlement offers.

The electoral incentives of criminal prosecutors are therefore potentially useful in encouraging the pursuit of justice. They may not, however, be sufficient. As we demonstrated in the previous section, appropriate sanctions for prosecutor misconduct are critical. If they are inadequate, there may be situations in which the prosecutor exerts investigative effort, detects true innocence, but proceeds to trial anyway. Second, voters must have information about a prosecutor's performance. The anecdotal evidence introduced earlier suggests that incumbent prosecutors do tout their conviction rates, while their opponents argue these rates are tainted by the fact that many cases are dropped or settled via plea bargains. Scheingold's (1991) examination of twenty-five years of media coverage of crime in one town suggests a similar discourse about conviction rates. Nonetheless, there is clearly room for more systematic inquiry into the types of information voters' have when evaluating prosecutors. If voters cannot observe cases that are disposed of outside of the courtroom, they cannot figure out which cases are being settled or dropped. A prosecutor can pad her record if she is able to keep the public from realizing that potential cases are never even processed. Again, if the criminal justice system is insufficiently transparent, this method of evaluation will fail. In this regard, challengers with access to detailed performance information play the role of auditor, advertising the prosecutor's performance outside the courtroom as well as inside it. Prosecutors seeking to retain office will likely follow the electoral incentives outlined in this paper if only to deter this scrutiny.

If voters can access this information, do they use it? On this question, the jury is still out (no pun intended). But, our article at least offers some hope that voters can use conviction, acquittals, and dropped cases to help evaluate candidates for office. Unlike congressional or presidential elections, local prosecutor elections are likely to be situations in which voters have very little information about the merits of different candidates. In this sense, elections for prosecutor are like those for trial court judges (cf. Baum 1993; Dubois 1984; Kiel, Funk, and Champagne 1994; Aspin 1998, 1999). Further, the "causal chain" linking the official's behavior and actual outcomes such as the crime rate is difficult to discern (Arnold 1990; Wilson 1989, 163–164). Output measures such as conviction rates may simply be a means by which voters can rely on shortcuts to make decisions in low information settings (Lupia 1992).

Conclusion

The prosecutor's power stems in large part from her role as gatekeeper in the criminal justice system. Juries convict, judges sentence, and wardens incarcerate, but it is the prosecutor who at the outset of a criminal case selects those individuals who will enter the system. Because chief prosecutors are virtually always elected officials, the

extent to which they are accountable to the public is an essential component of democratic governance. Moreover, because the prosecutor exercises such formidable coercive authority over individuals, the extent to which her desire to maintain office might distort her incentives to accurately match punishment to crime is an essential component of procedural and substantive justice.

The model of the relationship between the prosecutor and the public we have presented reveals that voters can use the incentive of reelection to induce the prosecutor to learn the truth about individual cases, helping to mitigate against the problem of wrongful convictions and acquittals and thereby promoting justice. This occurs when information about the likely guilt or innocence of a defendant is relatively ambiguous to the prosecutor and the outcome of a trial under these circumstances is similarly uncertain. When the defendant appears almost certainly guilty or innocent, however, the voter will in general not succeed in making the prosecutor exert much effort. Fortunately, if the voter can observe some information about a defendant's guilt, he can still compel the uninformed prosecutor to try or drop cases as he would in her shoes. This relationship holds even though voters cannot directly observe the true guilt or innocence of individual defendants, nor the level of effort exerted by the prosecutor herself.

Perhaps most importantly, our model predicts that voters will always reward prosecutors for obtaining convictions and punish them for acquittals. This strategy holds irrespective of either how tough on crime voters want prosecutors to be, or how much information voters have about individual cases. Rewarding convictions increases the likelihood that prosecutors will seek out the truth, without necessarily inducing prosecutors to pursue innocent defendants overzealously. The model predicts that lowering the electoral rewards for convictions would not cause prosecutors to pursue fewer frivolous cases. Instead, it would impel them to drop more cases they would otherwise spend time investigating thoroughly. Our findings are not all good news, however. We find that unless the cost of investigation is negligible, prosecutors will sometimes pad their records with easy wins. Rewarding convictions, however, does not encourage this behavior. Also, a diligent prosecutor will sometimes not be reelected when she fails to secure convictions, even though she faithfully sought out the truth and the public opposes unwarranted convictions.

Overall, this framework for considering voter oversight of prosecutor behavior provides important insights into the politics of district and county attorney elections. Convictions and acquittals, as well as dropped cases, can be useful in assessing prosecutor performance. Voters, even liberal ones, are not fools to reward prosecutors who obtain convictions. Other than folk wisdom about the importance of conviction rates, little is known about citizen oversight of these important elected officials. Examining data on the relationship between prosecutor performance and reelection is clearly an important next step.

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Appendix
The Effort Constraint in Inequality (5) Is Increasing in ϕ_c, Decreasing in ϕ_a, and Nonmonotonic in ϕ_d

The right side of equation (5), which we will call r, expands to

$$r = \frac{\phi_d\phi_c - \phi_d^2 - 2c\phi_d - \phi_a\phi_c + \phi_a\phi_d + c\phi_a + c\phi_c - c^2}{\phi_c - \phi_a}.$$

Then

$$\frac{\partial r}{\partial \phi_c} = \frac{(\phi_a - \phi_d - c)^2}{(\phi_c - \phi_a)^2} \text{ and } \frac{\partial r}{\partial \phi_a} = -\frac{(\phi_c - \phi_d - c)^2}{(\phi_c - \phi_a)^2}.$$

In light of the constraint $\phi_c - c > \phi_d > \phi_a$, the first quantity is positive for any triple (ϕ_c, ϕ_d, ϕ_a), and the second is always negative. Additionally,

$$\frac{\partial r}{\partial \phi_d} = \frac{\phi_c - 2\phi_d + \phi_a - 2c}{\phi_c - \phi_a}.$$

The constraint is increasing in ϕ_d when $\phi_d < (\phi_c + \phi_a - 2c)/2$, and decreasing when ϕ_d exceeds this quantity.

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[Footnotes]

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