Abstract

We examine how prosecutors of differing capabilities respond to evaluation criteria in choosing what cases to take to trial and what to plea bargain. We show how different criteria distort the mix of cases chosen for trial and that the direction of the distortion depends crucially on the tool used. Optimal evaluation metrices are derived that combine multiple measurements of performance and are shown to achieve the first-best outcome.

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How Should Prosecutors Be Evaluated?

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1 Introduction

In the United States public prosecutors typically face re-election.[1] While this may imply that having to face such elections makes prosecutors responsive to the 'will of the people' there is little formal work on how voters evaluate prosecutors[2]. The few studies done suggest that cases brought to trial receive a lot of weight in judging a prosecutor's quality (Wright, 2009). We investigate the question of whether evaluating prosecutors using what appear reasonable indicators of quality lead to distortions in the types of cases brought for trial and how differing methods of evaluation lead to different distortions. Given the preponderance of plea bargaining in the US, we look, in particular, at how the mix of cases tried in court versus plea bargained responds to how prosecutors are evaluated.

The tradeoff prosecutors face is between a costly trial which potentially has a greater sanction (for a given level of evidence) but opens up the possibility of a failure or plea bargain which saves the cost of trial and avoids acquittal but leads to a lower sanction. We examine how commonly considered measures of success at trial affect the decisions of the prosecutor in the mix of cases she chooses to take to trial. In particular, we examine if they lead to 'too much' or 'too little' plea bargaining. It turns out that the answer

[1] The three states that do not re-elect prosecutors are Alaska, Connecticut, and New Jersey (Perry, 2006). Furthermore, we adopt the term prosecutor to denote the official who advocates for the public in felony cases. Across the United States they take a variety of names including District Attorney (as in North Carolina) and Commonwealth Attorney (as in Virginia). Federal prosecutors (U.S. Attorneys) are appointed by the Attorney General.

[2] While we could not find any formal work which considers the re-election incentives of prosecutors, work on re-election of regulators by Besly and Coate (2003) suggest that elected regulators respond more to consumer incentives.

crucially depends on the metric used. Evaluating prosecutors on the basis of their being able to obtain stiff sentences is shown to lead to an insufficient amount of plea bargaining and an excessive number of trials. Desiring to be retained, prosecutors increase their aggregate sentence length by taking cases to trial where the difference between the expected sanction from trial and that obtained via plea bargaining is too small to justify the costs. Alternatively, if success in court is used to measure the prosecutor's quality, then an excessive amount of plea bargaining and too few cases are brought to trial. A prosecutor, to improve her conviction rate, may withhold cases from trial where the gain in the expected sanction from court is otherwise justified given the costs.

This leads one to raise the question as to what is the best metric to use to evaluate prosecutors. It is shown in the environment considered that there exist a number of measures which are able to achieve the first best outcome. If used in combination with each other the two considered eliminate the distortions and achieve the first best outcome. For example, the conviction rate a higher quality prosecutor obtains in the first best outcome can be required by the retention agents. A lower skilled prosecutor would have to withhold many cases from court to achieve this rate of success. As a consequence, the aggregate sentence length achieved would be less since many cases would be plea bargained at lower sentences. Therefore, requiring, also, a sufficiently high aggregate sentence length successfully separates high and low quality leading them to choose the first best amount of prosecution.

This result emphasizes that the focus on success in trial however measured, rather than overall performance, leads to a bias in the optimal mix of

cases tried and plea bargained. Thus, we formalize the intuition in Wright (2009) that focus on trials distorts incentives and that looking at total performance (which includes plea bargain deals) is a good way to evaluate prosecutors. The point about looking at conviction rates is made in Rasmusen, Raghav and Ramseyer (2009) as well which says any system which pays attention to conviction rate rather than number of convictions is liable to abuse. However, using the number of cases as a criteria as suggested by them will lead to strategically choosing to prosecute on the lowest and most easily provable charge. Bibas (2009) acknowledges that evaluation tools are incomplete and manipulatable. He proposes performance-based compensation to encourage line prosecutors to serve their constituents. Boylan (2005) analyzing data of chief federal prosecutors and their subsequent careers finds results that suggest prosecutors maximize sentence length as opposed to conviction rates. Glaesar, Kessler, and Piehl (2000) find evidence that career concerns affect the decisions of U.S. Attorneys and, specifically, has lead to an increase in the federalization of drug crimes. In an environment where a prosecutor selects the amount of effort to exert Garoupa (2009) argues that mandatory prosecution might well be more appropriate than selective prosecution. Thus, along with his call for reductions in prosecutor's insulation it is shown here that the optimal evaluation must consider the distortions the choice of signal may cause.

This is not the first work to consider signalling in the pretrial activities of agent's in the judicial system. Reinganum (1988) models the prosecutors choice between dismissal, plea bargaining, and prosecution at trial by considering the asymmetric information regarding the strength of the evidence

known by the prosecutor. The plea offer made by the prosecutor itself acts as a signal. Reinganum (2000) considers the opportunity for a defendant to use his offer during plea bargaining to signal the severity of the harm he caused, which may be revealed during the trial. These models are used to evaluate the effect of policy (restrictions to prosecutorial discretion and sentencing guidelines respectively) on the plea bargaining process. Here we are interested on how retention policies affect such choices. [cite Leshem and Reinganum and Wilde (86)]

The results also contribute to the expansive literature on plea bargaining. Plea bargaining's value has been argued to have been to reduce the costs of the legal system (Landes, 1971), screen guilty from innocent defendants (Baker and Mezzetti, 2001; Bjerk, 2007), and to act as insurance for risk averse individuals (Grossman and Katz, 1983). We provide a new explanation for the distorted use of plea bargaining. In environments where it is optimal to save the costs of trial and negotiate a plea a prosecutor may choose not to and take the case to trial. She does this because of career concerns. The opportunity for a greater sanction arising in court improves her record and aids in her retention. While many have emphasized the incentives placed on the defendant's lawyer (Delacote and Ancelot, 2009; Ferrer, 2009; Leshem, 2009) the results highlight the need to the prosecutor's incentives as well.

In terms of modeling, this paper has similarities with the literature on 'incumbent challenger' models (starting from Ferejohn, 1973, see Besley, 2006 for an overview of the literature) which looks at the agency issues involved in the election of elected representatives. Such models have been used to analyze a host of situations including budget cycles (Rogoff and Siebert,

1988, Rogoff, 1990), persistence of inefficient policy (Majumdar and Mukand , 2004), transfers to interest groups (Coate and Morris, 1995) and persistence of conflict (Bandyopadhyay and Oak, 2010). Similar to our model, this literature examines what distortions arise as a result of trying to understand the quality of politicians from the actions they take in office. Our model predicts an excessive behaviour in line with most results in the literature. However, unlike most such models we are able to characterize optimal contractswhich give us the first best using a combination of performance measures.

Section 2 presents the model. The first-outcome outcome is identified. Section 3 investigates the effects of two primary evaluation tools that could be used to measure the quality of an incumbent prosecutor: the aggregate sentence length obtained and the conviction rate. The equilibria are derived. The optimal contract is derived in Section 4. Section 5 concludes.

2 Model

To better understand how the evaluation of prosecutors affects the criminal justice system consider a two-period model. In the first period there is a single prosecutor of unknown quality who is to decide how to handle cases brought before her. Let the parameter θ denote the quantity and quality of evidence she has against the defendant in any given case. Assume $\theta \in [0, \theta_M]$ where $\theta_M < \infty$ and is exogenously given. Observing θ for a particular case the prosecutor has two options in which to choose from. She may either try the case by taking it to trial or she may engage in plea bargaining. Hence, the choice of whether to file charges and which charges to file has already been made. Assume that a 'large number' of cases come up in the

first period, which are either tried or plea bargained. One may think of the first time period as a term in office. For example, in North Carolina state district attorneys are elected to four year terms. At the end of the period the retention official looks at some measure of performance and either retains the prosecutor or replaces her. The retention official may be thought of as the median-voter in the upcoming election or an elected official, such as the state's Attorney General who makes the retention decision. If replaced a new prosecutor is chosen for the second period from a pool of available candidates. Hence, the second period can be thought of as the next term in office. We now consider the first period problem for a prosecutor who has to decide in a particular case whether to take it to trial or agree to a plea bargain.

Consider the option of taking the case to trial. Denote $S(\theta)$ as the sanction received if successful in the courtroom. For example, the sanction may represent the length of time the criminal is incarcerated. Assume the sanction is increasing in the evidence, $\frac{dS}{d\theta} > 0$, and that no evidence results in no sanction, $S(0) = 0$. The sanction is known and is exogenously set by, for example, sentencing guidelines. Alternatively, with judicial discretion, uncertain parole outcomes, and appeals this is best thought of as the expected sanction. Additionally, the probability the prosecutor is successful at trial depends on the quality of the prosecutor and the quality of the evidence. To keep the analysis simple suppose the prosecutor takes one of two types $q \in \{H, L\}$ which we call high and low respectively. She is high quality with probability $\gamma \in (0, 1)$ and low quality with probability $1 - \gamma$. A high-quality prosecutor wins at trial with probability $p_H(\theta)$, while if she is low quality she wins with probability $p_L(\theta)$. Assume $1 > p_H(\theta) > p_L(\theta) > 0 \ \forall \theta$ and

$\frac{dp_q}{d\theta} \geq 0 \; \forall q$. Finally, if she takes the case to trial a cost $C_p > 0$ is experienced, which for simplicity is assumed to not depend on the quality of the evidence or the prosecutor's ability.[3]

With regards to the plea bargaining option, denote $B(\theta)$ as the agreement that arises. As the prosecutor type is unknown the outcome under plea bargaining cannot be conditioned on type. Since there are costs associated with the trial then, absent any asymmetric information (cite) or optimism bias (cite), plea bargaining is successful. One might expect $\frac{dB}{d\theta} > 0$ so that better evidence against the defendant results in a tougher plea agreement, but it is only assumed that $\frac{dpS}{d\theta} > \frac{dB}{d\theta}$ and $B(\theta) > 0 \; \forall \theta$.[4] A natural plea agreement to consider is the one that arises as the Nash Bargaining Solution. In this case, $B(\theta) = \frac{p_i(\theta)S(\theta)+C_p+C_d}{2}$ where C_d is the cost to the defendant of going to trial. This assumption, though, is not required in the analysis.

Denote $w(B(\theta))$ as the welfare generated from a case that generates the plea bargain $B(\theta)$ and $w(p_q(\theta) S(\theta) - C_p)$ as the welfare generated from a case that goes to trial.[5] Assume w is a strictly increasing function. Denote $W(q)$ as the welfare generated over the entire term, or rather, the first-period welfare when the prosecutor is of quality q. To link the two concepts let $F : [0, \theta_M] \rightarrow [0, 1]$ denote the distribution function in which the quality/quantity

[3] It is also valuable to assume that the cost is not too high. If the cost to going to trial is excessively high, then it is possible that even with extremely good evidence, the expected utility to going to trial is less than the value of plea bargaining. Therefore, assume $C_p \leq p(\theta_M) S(\theta_M) - B(\theta_M)$.

[4] This simply means that the sanction from plea bargaining is positive and the sanction from increased levels of θ rises at a faster rate for going to trial than from plea bargaining.

[5] Note that welfare is defined on the expected sanctions. Since retention is based on the anticipated outcome in the future term, this assumption simplifies the analysis. Of course, the expected welfare realized equals the welfare of the expected sanction if w is a linear function, but this is not assumed.

of evidence from each case is (independently) drawn. $F(\theta')$ denotes the probability an arbitrarily selected case has an evidence parameter less than or equal to θ'. Assume that a large number of cases arise in the term and the that the number of cases disposed does not depend on the manner in which the prosecutor disposes of them so that the expected welfare from a case equals the average welfare generated from each case over the course of the term.[6] Given this assume first-period welfare equals the expected welfare from a randomly selected case. Thus, for example, if a prosecutor chooses to take every case to trial where $\theta \geq \overline{\theta}$ and plea out those with $\theta < \overline{\theta}$, then first-period welfare is

$$W(q) = \int_{\theta=0}^{\overline{\theta}} w(B(\theta))\, dF(\theta) + \int_{\theta=\overline{\theta}}^{\theta_M} w(p_q(\theta)\, S(\theta) - C_p)\, dF(\theta). \quad (1)$$

As a consequence, first-period welfare is greater if the more severe punishment is imposed. It is worthwhile to point out that this does not necessarily mean that society benefits from having every defendant punished with the harshest sanction possible, but rather that given the option to impose the high sanction deemed appropriate by the judge, sentencing board, legislature (via statute), etc. or to accept a plea offer welfare is greater if the prosecutor achieves the higher of the two. Similarly, this setup implies that the cost associated with going to trial is measured in the same units of measurement as the sanction (e.g. years in prison). Finally, denote $V(q')$ as the second-period welfare when the prosecutor is of quality q'. Assume for simplicity $\frac{dV}{dq'} > 0$. Consequently, total welfare is $W(q) + V(q')$.

[6] While an interesting and important issue to address, the discussion of case backlogs, judicial resources, and incentives used to encourage judicial actors to process more cases is not considered here.

2.1 First Best

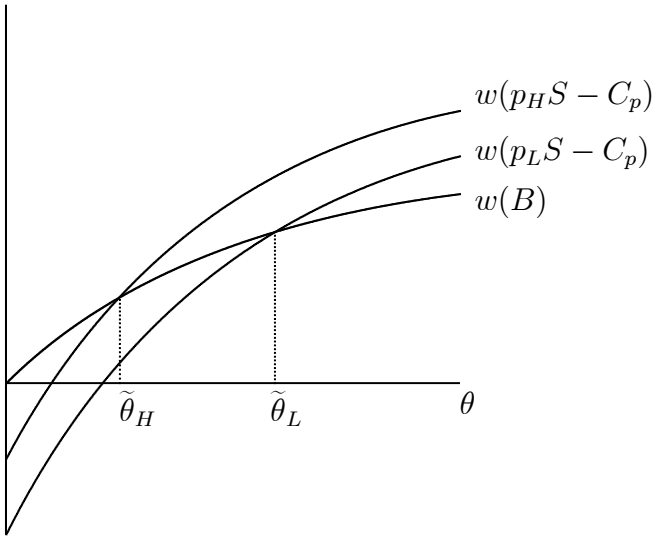
In this environment the first-best outcome can be described. Taking a case to trial maximizes the welfare generated from that case if $w\left(p_q\left(\theta\right)S\left(\theta\right)-C_p\right) > w\left(B\left(\theta\right)\right)$, or rather, if $p_q\left(\theta\right)S\left(\theta\right)-C_p > B\left(\theta\right)$. Since it is assumed that $\frac{dpS}{d\theta} > \frac{dB}{d\theta}$ and $S\left(0\right)=0<C_p$, it follows immediately that there exists a threshold value of θ, denoted $\widetilde{\theta}_q$, where welfare is equal between the two options.[7] The threshold value depends on the prosecutor's quality since the probability of conviction depends on her abilities. Consequently, $\widetilde{\theta}_L > \widetilde{\theta}_H > 0$. If $\theta > \widetilde{\theta}_q$, then $W\left(q\right)$ is increased when the case proceeds to trial. In this scenario the evidence is so great that the expected sanction is high enough to make the trial preferable. The plea bargain, which divides the surplus between the two parties, is insufficient.[8] If $\theta < \widetilde{\theta}_q$, then the best outcome is for the case to be decided by plea bargaining. The expected sanction is small and with the costs of the trial the resulting plea results in a better outcome. Figure 1 depicts the determination of these thresholds.

Additionally, the first-best outcome requires that if the prosecutor is of high quality, $q=H$, then she be retained since $V\left(H\right) > V\left(L\right)$. Also, if the prosecutor is of low quality, then a new prosecutor be selected since $EV = \gamma V\left(H\right)+\left(1-\gamma\right)V\left(L\right)$.

[7] With the assumption that $p_q\left(\theta\right)S\left(\theta\right)$ and $B\left(\theta\right)$ are continuous functions and C_p is bounded from above, the intermediate value theorem guarantees that these thresholds (and all thresholds derived throughout the analysis) exist.

[8] Clearly, an agreement of $B\left(\theta\right)=p_q\left(\theta\right)S\left(\theta\right)$ is always strictly preferred. While, for example, we do not explicitly model the bargaining process we presume the process divides the surplus. Consequently, in cases with better evidence the expected sanction obtained in court is greater even taking into consideration the costs of trial than what can be achieved at the negotiation table.

Figure 1: When to Prosecute



2.2 The Model with Asymmetric Information

Consider the principal-agent problem that arises where the retention official (e.g. median voter) wants to maximize total welfare, $W(q) + V(q')$, but does not know the quality of prosecutor or the quality of evidence of each particular case. With perfect information high-quality prosecutors who are more likely to be successful in the courtroom, should be retained, but low-quality prosecutors should be replaced. However, if there is a bonus for being retained the prosecutor may take steps necessary to remain in the position even if such measures are socially detrimental. We are interested in understanding when and if the desire to be retained distorts the outcomes of the judicial system and what retention officials can do to mitigate these imperfections.

Before the incentives of the prosecutors are addressed, recall that for

cases where $\theta > \widetilde{\theta}_L$ welfare-maximization requires that both high-quality and low-quality prosecutors go to trial, while for cases where $\theta \leq \widetilde{\theta}_H$ both types should plea bargain. Only if $\widetilde{\theta}_L \geq \theta > \widetilde{\theta}_H$ does optimal behavior differ - high-quality prosecutors should take the case to trial while a low-quality prosecutor should plea bargain. Since the former is more successful in court only her surplus from trial (the difference between the expected sentence and the sanction that can be achieved through plea bargaining) justifies the court costs. Suppose the quality of the prosecutor is unobservable to the retention agents. The retention agents, as stated, would like the sanction to be the highest of those possible and would prefer that the prosecutor in the second-period be of high quality. If they can identify the type of the prosecutor, then they can remove from office the low-quality prosecutor and retain a high-quality prosecutor.

To understand how the objectives of the principal affect the behavior of the agents suppose the benefit received by the prosecutor from a particular case is $u\left(P_q\left(\theta\right)\right)$ where $P_q\left(\theta\right)$ is the expected sanction; either $P_q\left(\theta\right) = p_q\left(\theta\right) S\left(\theta\right) - C_p$ or $P_q\left(\theta\right) = B\left(\theta\right)$. Her total utility, $U\left(q\right)$, then, aggregates the benefit derived in each case. As in the derivation of first-period welfare, assume that the expected utility of a randomly selected case equals the average utility generated over the term. Also, let $b > 0$ denote the bonus received by the prosecutor if and only if she is retained by the retention agents. One may think of the bonus as future wages earned, but could also represent the future gains from an altruistic prosecutor who when retained gains utility from prosecuting future cases (cite). Thus,

$$U\left(q\right) = \int_{\theta=0}^{\theta_M} u\left(P_q\left(\theta\right)\right) + b. \tag{2}$$

Hence, the prosecutor cares about obtaining the strongest punishment possible (net of any costs) as well as has the incentive to behave so as to be retained. To simplify the analysis assume, absent compensation, the preferences of the prosecutor are directly related to welfare, $u(P) = \alpha w(P)$ for $\alpha > 0$. Thus, the environment may be best thought of as addressing the decision making of the 'chief' prosecutor who is directly accountable to the voting public so that other than the desire to be retained has preferences that are aligned with societal well-being.

Consider the following scenario. Suppose $\theta \in \left(\widetilde{\theta}_H, \widetilde{\theta}_L\right]$. If the prosecutor is of low quality, then the first-best outcome is for her to plea bargain. If a high-quality prosecutor is expected to follow the first-best outcome, then the aggregate sanctions achieved by the two prosecutors from trial will differ and retention agents will be able to identify the skill of the prosecutor and dismiss one of low quality. Thus, her mix of plea bargain versus trial may be distorted to attempt to be retained. We will solve for the Perfect Bayesian equilibrium of this game under different evaluation criteria to assess the impact of the metric used.

3 Prosecutor Evaluation

The question becomes how does this incentive to misrepresent affect the behavior of the prosecutor when she is of low quality and when she is of high quality. The retention agents, who do not have access to the information on her true type, may use a number of measures to evaluate the prosecutor to make their retention decision. How do different evaluation tools affect the prosecutor's behavior?

3.1 Sentence Length

One way in which the retention agents, whether they be the voting public or appointment officials, may assess the quality of the prosecutor is to look at the length of the sentences she is able to obtain. She may achieve sanctions through plea bargaining or through successes in the courtroom. Over the course of her term many cases with differing amounts of evidence come before her for a decision. Thus, the aggregate sanction imposed over the course of her term can potentially be used to assess her quality.

Define X as the aggregate sentence length obtained. As described, for each trial an independent draw of θ is taken from the distribution function F. The prosecutor selects a threshold value of θ, denoted $\overline{\theta}_q$ for her term. Since it is assumed that the difference between the expected sanction from trial and the plea bargain grows as the quality and quantity of evidence improves, any trial with a value of θ greater than $\overline{\theta}_q$ is taken to trial, while one with a value less results in a plea bargain. The threshold she chooses may depend on her quality. For those cases plea bargained the sanction $B(\theta)$ is received, while for those that go to trial the expected sentence of $p_q(\theta) S(\theta)$ is obtained. Therefore, the expected sanction generated is

$$X_q = \int_{\theta=0}^{\overline{\theta}_q} B(\theta)\, dF(\theta) + \int_{\theta=\overline{\theta}_q}^{\theta_M} p_q(\theta)\, S(\theta)\, dF(\theta). \tag{3}$$

Since it is assumed that a large number of cases are decided in a term, so that the expected sanction of a randomly selected case represents the actual aggregate sentence when the number of cases is normalized to unity.

3.1.1 Separating Equilibria

To understand the impact of this evaluation metric consider, first, the separating equilibria. In such equilibria the retention agents offer to retain the prosecutor if her aggregate sentence length matches or exceeds X^e supported by the belief that a prosecutor whose aggregate sanction is greater than or equal to X^e is type H and those below are type L. Which values of X^e are they be able to obtain in a separating equilibrium?

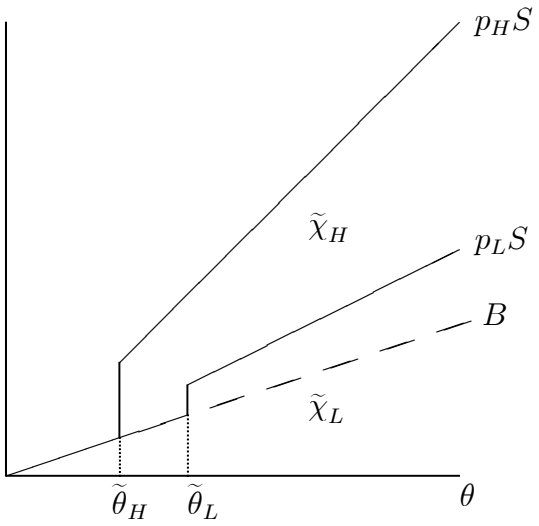
As a useful point of reference, consider the aggregate sanction that arises in the first-best outcome. When $\overline{\theta}_H = \widetilde{\theta}_H$ her aggregate sentence length is

$$\widetilde{X}_q = \int_{\theta=0}^{\widetilde{\theta}_q} B(\theta)\, dF(\theta) + \int_{\theta=\widetilde{\theta}_q}^{\theta_M} p_q(\theta)\, S(\theta)\, dF(\theta). \tag{4}$$

If $\theta \leq \widetilde{\theta}_H$, then the prosecutor plea bargains, regardless of her type, and receives the sentence $B(\theta)$.[9] For $\theta \in \left(\widetilde{\theta}_H, \widetilde{\theta}_L\right]$ a high-quality prosecutor goes to trial and a low-quality prosecutor plea bargains. Since $\frac{dpS}{d\theta} > \frac{dB}{d\theta}$ and $p_H(\theta)\, S(\theta) - B(\theta) > 0$, a high-quality prosecutor generates a greater aggregate sanction over this interval. Finally, for $\theta > \widetilde{\theta}_L$ the prosecutor takes the case to trial regardless of her type. Since high quality wins with a greater probability the expected sanction obtained is greater. Consequently, $\widetilde{X}_H > \widetilde{X}_L$. Thus, since a prosecutor of high quality wins at trial with a higher probability and takes more cases to trial, sentence length is a reasonable

[9] The model presented here assumes the plea agreement is independent of the prosecutor's type. In some scenarios, it may seem more reasonable to assume that the plea bargain is greater for a high-quality prosecutor. For example, as mentioned previously, if the Nash Bargaining Solution is used, then the default outcome is greater if she is of (known) high quality and, consequently, the sanction agreed to is greater. It is assumed it to be invariant to quality because the defendant does not know the prosecutor's type and, thus, bargaining is not conditioned on it. Instead, the average quality may be used.. Assuming $B_H(\theta) > B_L(\theta)$ only enhances the results presented.

Figure 2: Sentence Length



metric to use. Figure 2 illustrates the derivation of $\widetilde{X}_q$.

We assume that self separation is not an equilibrium. Specifically, both types of prosecutors are willing to achieve the aggregate sentence length $\widetilde{X}_H$ to be retained. This assumption simply requires that

$$b \geq \underline{b} \equiv \int \left[u\left(B\left(\theta\right)\right) - u\left(p_L\left(\theta\right) S\left(\theta\right) - C_p\right) \right] dF\left(\theta\right). \tag{5}$$

so that the gain to being retained justifies the additional prosecution.[10] Thus, X^e must be greater than $\widetilde{X}_H$. Additionally, since for any fixed compensation the utility of the prosecutor is monotonically increasing in welfare, a high-quality prosecutor is interested, if she retains her job, in achieving the lowest aggregate sentence length that achieves her retention, or rather, $X = X^e$.

[10]The total utility of selecting $\overline{\theta}_L = \widetilde{\theta}_H$ is from (3) $\int_0^{\widetilde{\theta}_H} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\widetilde{\theta}_H}^{\theta_M} u\left(p_L\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right) + b$, while the total utility of selecting $\overline{\theta}_L = \widetilde{\theta}_H$ (the best option if not retained) is $\int_0^{\widetilde{\theta}_L} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\widetilde{\theta}_L}^{\theta_M} u\left(p_L\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right)$. Setting the former greater than the latter and simplifying generates (5).

This is equivalent to setting a threshold, θ_H^e, below $\widetilde{\theta}_H$ and increasing her aggregate sentence length by trying in court some defendants who in the first-best outcome would have received a plea offer. For this to be an equilibrium she must be willing to push for these harsher sanctions. If she chooses not to achieve X^e, then since she is not retained the best choice for her is $X = \widetilde{X}_H$. Therefore, selecting θ_H^e is preferable if

$$\int_{\theta=0}^{\theta_H^e} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\theta_H^e}^{\theta_M} u\left(p_H\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right) + b \quad (6)$$

$$\geq \int_{\theta=0}^{\widetilde{\theta}_H} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\widetilde{\theta}_H}^{\theta_M} u\left(p_H\left(\theta\right) S\left(\theta\right)\right) - C_p) dF\left(\theta\right)$$

Consequently, there exists a threshold level of θ for the separating equilibrium, denoted θ_H^s, where if $\theta_H^e \geq \theta_H^s$, then the high-quality prosecutor is willing to take enough cases to court to remain in her position. This corresponds to a level of X, denoted X_H^s $(> \widetilde{X}_H)$.

Now consider the incentives of the prosecutor of low quality. If she does not attempt to increase X to X^e, then she will not be retained. Since her preferences are proportional to welfare it follows that if she chooses not to achieve X^e she selects $X = \widetilde{X}_L$ by adopting $\overline{\theta}_L = \widetilde{\theta}_L$. Alternatively, she may choose to misrepresent her type by taking more cases to court and plea bargaining less. Since she is less successful in court, even more cases must be tried than if she is more skilled. Thus, to obtain X^e her threshold, $\overline{\theta}_L$, must be set at a value less than θ_H^e. Denote the value of θ that generates $X = X^e$ as θ_L^e. Therefore, X^e can be supported as a separating equilibrium if

$$\int_{\theta=0}^{\theta_L^e} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\theta_L^e}^{\theta_M} u\left(p_L\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right) + b \quad (7)$$

$$\leq \int_{\theta=0}^{\widetilde{\theta}_L} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\widetilde{\theta}_L}^{\theta_M} u\left(p_L\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right)$$

as well. Again, denote θ_L^s as the level that equates (7) and a corresponding level X_L^s. Thus, a low-quality prosecutor is unwilling to mimic the high-quality prosecutor if $\theta_L^e < \theta_L^s$, or rather if $X^e > X_L^s$.

As a consequence, if $X^e > \widetilde{X}_H$ a separating equilibrium exists so long as $X^e \in [X_L^s, X_H^s]$. It must be verified that this interval exists. As $p_H\left(\theta\right)$ is greater than $p_L\left(\theta\right)$ for all cases, it must be that $\theta_H^s < \theta_L^s$. It follows immediately, then, that $X_H^s > X_L^s$. Thus, the interval is non-empty. Additionally, it follows from the assumption of $b > \underline{b}$ that $X_L^s > \widetilde{X}_H$.

Proposition 1 *Suppose retention agents use the aggregate sentence length to retain prosecutors. There exists a range of aggregate sanctions,* $[X_L^s, X_H^s]$*, in which separating equilibria exist. Furthermore, all separating equilibria involve too many trials and an insufficient amount of plea bargaining.*

As a consequence of Proposition 1 using aggregate sentence length to distinguish high-quality prosecutors from low-quality ones, the incentives encourage a prosecutor of high quality to engage in an excessive number of trials to improve the length of her obtained sentences. The increase in the number of trials has to be so great that a low-quality prosecutor is unwilling to plea bargain so few cases. Interestingly, in these equilibria it is the low-quality prosecutor that selects the welfare-maximizing number of trials.

3.1.2 Pooling Equilibrium

Of course, this is not the only type of equilibrium possible. It may well be that pooling equilibria exist. In a pooling equilibria both types achieve

an aggregate sentence length $\overline{X}$ and the retention official believes that a prosecutor who achieves $\overline{X}$ or above is type H with probability γ and type L with probability $1-\gamma$. What outcomes can arise in such an equilibrium?

First, a high-quality prosecutor if retained finds the first-best outcome, $\widetilde{X}_H$, most desirable since her preferences include society's well-being. If the retention agents attempt to achieve a pooling outcome at an aggregate sentence length less than this level, then a high-quality prosecutor simply deviates to the first-best outcome and retains her position. Thus, there is no pooling equilibrium where $\overline{X} < \widetilde{X}_H$.

Hence, consider outcomes where the retention agents require the aggregate sentence length be greater than or equal to $\widetilde{X}_H$ to be retained. For such an outcome to be a pooling equilibrium each agent must be unwilling to deviate. Since the outcome results in a greater aggregate sanction than what the prosecutor prefers it to be, regardless of her type, then only deviations to aggregate sentences less need be considered. If the retention agents believe that any such deviations are done by low-quality prosecutors, then they will choose not to retain one who makes the choice. Thus, a pooling equilibrium requires that deviating to $\widetilde{X}_q$, the most preferred outcome, results in a lower utility than achieving X^e and begin retained. Hence,

$$\begin{aligned} & \int_{\theta=0}^{\theta_q^e} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\theta_q^e}^{\theta_M} u\left(p_q\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right) + b \qquad (8) \\ \geq & \int_{\theta=0}^{\widetilde{\theta}_q} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\widetilde{\theta}_q}^{\theta_M} u\left(p_q\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right) \end{aligned}$$

where θ_q^e as before is the cutoff value of θ that if used, $\overline{\theta} = \theta_q^e$, obtains $X = \overline{X}$. Define θ_q^p as the value of θ that equates (8). A prosecutor of quality q is unwilling to pool with the other type if $\theta_q^e < \theta_q^p$. Let X_q^p denote the

aggregate sentence length obtained if $\overline{\theta} = \theta_q^p$. Thus, $\overline{X}$ can be supported as a pooling equilibrium only if $\overline{X} < X_q^p \ \forall q$. Since $p_H(\theta) > p_L(\theta) \ \forall \theta$, any aggregate sentence length a low-quality prosecutor is willing to achieve to be retained a high-quality prosecutor is also willing to obtain it to remain in the position. Thus, $X_H^p > X_L^p$. Also, since it is assumed that the compensation received by being retained is not too small (so that self-separation is not an outcome) it must be that $X_L^p > \widetilde{X}_H$. As a result, the interval $\left[\widetilde{X}_H, X_L^p\right]$ is non-empty and describes the set of pooling equilibria.

Alternatively, if $\overline{X} > \widetilde{X}_H$, then it may be reasonable for retention agents to believe that a deviation to $\widetilde{X}_H$ is done by a high-quality prosecutor. With these beliefs no pooling equilibrium other than $\overline{X} = \widetilde{X}_H$ exists. As is typical in signalling models the size of the ste of pooling equilibria depends on the belief regarding deviations to non equilibrium outcomes.

Proposition 2 *Suppose retention agents use the aggregate sentence length to retain prosecutors. If they believe a deviation to a lower aggregate sentence length is done by a low-quality prosecutor, then there exists a range of aggregate sanctions,* $\left[\widetilde{X}_H, X_L^p\right]$*, in which pooling equilibria exist. If they believe such deviations are done by a high-quality prosecutor, then the unique pooling equilibrium is for the prosecutor to obtain an aggregate sentence length of* $\widetilde{X}_H$*. Furthermore, all pooling equilibria involve too many trials and an insufficient amount of plea bargaining.*

As a consequence of Proposition 2 if using aggregate sentence length, but failing to distinguish between high-quality and low-quality prosecutors, a prosecutor of low quality is encouraged to engage in an excessive number

of trials to improve the length of her obtained sentences. Interestingly, if the retention agents believe that lower aggregate sentence lengths come from a low-quality prosecutor, then there exist equilibrium where both types of prosecutors engage in an insufficient amount of plea bargaining. Alternatively, with more reasonable beliefs high-quality prosecutors engage in the first-best amount of prosecution.

It is also instructive to consider the first-period welfare generated in these equilibria. Since $\frac{dpS}{d\theta} > \frac{dB}{d\theta}$ $\forall\theta$ welfare generated by a prosecutor of a given type not only peaks at $\widetilde{X}_q$, but is strictly increasing for $X < \widetilde{X}_q$ and strictly decreasing for $X > \widetilde{X}_q$. Among the potential pooling equilibria, clearly $\overline{X} = \widetilde{X}_H$ generates the greatest welfare; a high-quality prosecutor engages in the welfare-maximizing number of trials, while a low-quality prosecutor, who chooses an excessive amount of trials in all pooling equilibria, selects the least amount of litigation amongst the equilibria outcomes. Among the potential separating equilibria, $X^e = X_L^s$ generates the greatest welfare. A low-quality prosecutor selects the first-best outcome and a high-quality prosecutor, who is engaging in an insufficient amount of plea bargaining in all separating equilibria, chooses the fewest number of trials. Finally, comparing the welfare-maximizing pooling equilibrium to the welfare-maximizing separating equilibrium it is again clear that the best equilibrium when aggregate sentence length is used to evaluate the prosecutor is the pooling equilibrium $\overline{X} = \widetilde{X}_H$. Interestingly, notice that expression (7) is equivalent to (8) and, therefore, $\theta_L^p = \theta_L^s$, which, consequently, implies that $X_L^p = X_L^s$. Therefore, each pooling equilibrium results in a lower aggregate sentence length than any separating equilibrium. As an immediate result, then, all pooling equilibria

generate a greater amount of first-period welfare. It is worth emphasizing, though, that this considers only the welfare generated in the first period. The effect on total welfare is ambiguous. The value to the separating equilibria is that the quality of the prosecutor can be ascertained. Poor public officials can be identified and removed. While the quality of the replacement prosecutor is uncertain, the expected value of her quality is greater. Therefore, identifying which equilibrium is best depends crucially on the probability the replacement is of high quality, γ. If this probability is high, then the separating equilibrium may, in fact, maximize net welfare. If this probability is low, then net welfare is highest if a pooling equilibrium is achieved.

3.2 Conviction Rate

Another way retention agents may judge the quality of the prosecutor is to measure her success in court. Of those cases she decides to take to trial, the proportion in which she is successful is defined as her *conviction rate*.[11]

Formally, then, define r as the proportion of trials in which a positive sanction is earned. Again, the prosecutor selects a threshold value $\overline{\theta}_q$ for her term. Since $\frac{dp}{d\theta} > 0$ any case with a value of θ greater than $\overline{\theta}_q$ is taken to court, while one with a value less is plea bargained. Given this threshold the conviction rate can be determined. It is

$$r_q = \int_{\theta=\overline{\theta}_q}^{\theta_M} p_q(\theta)\, dF(\theta). \tag{9}$$

[11] In the framework considered the conviction rate is equal to one minus the acquittal rate and, consequently, evaluating based on the conviction rate is equivalent to evaluating based on the acquittal rate. The environment does not consider the differention between whether or not the defendant was"charged as convicted", which is argued to be a better measurement of success (Wright and Miller, 2002).

As before, to keep the analysis straightforward assume the number of cases dealt with is sufficiently large so that the expected conviction rate equals the realized conviction rate.

Again, consider the conviction rate at the first-best outcome, denoted $\widetilde{r}_q$. Since the threshold quality/quantity of evidence associated with the first best is $\widetilde{\theta}_q$ (as derived in Section 2.1), it follows that $\widetilde{r}_q = \int_{\theta=\widetilde{\theta}_q}^{\theta_M} p_q(\theta)\, dF(\theta)$. A high-quality prosecutor is more successful with the cases she takes to court than a low-quality prosecutor. Also, since $\widetilde{\theta}_H < \widetilde{\theta}_L$, a high-quality prosecutor takes to court cases with weaker evidence than a prosecutor who is of low quality. Thus, it is not necessarily clear whether $\widetilde{r}_H$ is greater or less than $\widetilde{r}_L$. To simplify the analysis and focus on sensible outcomes assume $\widetilde{r}_H > \widetilde{r}_L$ so that quality and success go hand-in-hand. Such an outcome would arise when the level difference between $p_H(\theta)$ and $p_L(\theta)$ for higher values of θs (values where the prosecutor takes the case to trial regardless of her quality) is sufficiently greater than the success a high-quality prosecutor can obtain in cases with weak evidence.[12]

3.2.1 Separating Equilibrium

Consider, first, the existence of separating equilibria if her conviction rate is used to determine whether she is retained. Suppose the retention agents keep the prosecutor if the conviction rate is above r^e and dismiss her if the conviction rate is less than r^e. Which values of r^e generate a separating equilibrium?

[12] Formally, the improvement in success for cases both types take to court, $\int_{\widetilde{\theta}_L}^{\theta_M} [p_H(\theta) - p_L(\theta)]\, dF(\theta)$, must be greater than the success experienced by a high-quality prosecutor in only those cases she takes to trial, $\int_{\widetilde{\theta}_H}^{\widetilde{\theta}_L} p_H(\theta)\, dF(\theta)$.

For such an outcome to be an equilibrium the prosecutor must be interested in attaining this conviction rate. Suppose $r^e \geq \widetilde{r}_H$ and denote, as before, θ_q^e as the cutoff in which a prosecutor of quality $q \in \{L, H\}$, if she sets $\overline{\theta}_q = \theta_q^e$, achieves $r = r^e$. Since $r^e > \widetilde{r}_H$ and $\frac{dp_q}{d\theta} > 0$, $\theta_q^e > \widetilde{\theta}_q$. Thus, a prosecutor's decision decomposes to a choice of increasing the number of cases in which she plea bargains to reach the high conviction rate and be retained or to forgo retention and select the amount of prosecution that maximizes her well-being, which is $\widetilde{\theta}_q$ since her utility is proportional to welfare. Thus, she is willing to remain in her position if

$$\begin{aligned} & \int_0^{\theta_q^e} u\left(B\left(\theta\right)\right) dF(\theta) + \int_{\theta_q^e}^{\theta_M} u\left(p_q(\theta)S(\theta) - C_p\right) dF(\theta) + b \qquad (10) \\ \geq & \int_{\theta=0}^{\widetilde{\theta}_H} u\left(B\left(\theta\right)\right) dF\left(\theta\right) + \int_{\theta=\widetilde{\theta}_q}^{\theta_M} u\left(p_q\left(\theta\right) S\left(\theta\right) - C_p\right) dF\left(\theta\right). \end{aligned}$$

Denote the value of θ in which (10) holds with equality as ϕ_q^s. Consequently, for a separating equilibrium to exist the proposed threshold must be less, or rather, $\theta_H^e \leq \phi_H^s$, for a high-quality prosecutor to be willing to increase her conviction rate to be retained. This corresponds to a conviction rate, denoted r_H^s, so that a separating equilibria must have $r^e \leq r_H^s$. Similarly, for a separating equilibrium to exist the proposed threshold must be greater, or rather, $\theta_L^e \geq \phi_L^s$, for a low-quality prosecutor to not be willing to increase her conviction rate to mimic a more skilled prosecutor. This threshold is associated with a conviction rate, r_L^s, where all separating equilibria are required to have $r^e \geq r_L^s$. Consequently, if $r^e \in [r_L^s, r_H^s]$, then r^e is a separating equilibrium.

Finally, it must be verified that this interval exists. Since $p_H\left(\theta\right) \geq p_L\left(\theta\right)$

$\forall\theta$, any conviction rate a low-quality prosecutor is willing to obtain to be retained; a high-quality prosecutor is also willing to achieve. Therefore, $r_L^s < r_H^s$. Additionally, it follows from the assumption of $b > \underline{b}$ that $r_L^s > \widetilde{r}_H$.

Proposition 3 *Suppose retention agents use the conviction rate to retain prosecutors. There exists a range of conviction rates, $[r_L^s, r_H^s]$, in which separating equilibria exist. Furthermore, all separating equilibria involve an insufficient number of trials and too much plea bargaining.*

If retention agents use the prosecutor's record of success at trial as a measure to evaluate quality and make the decision of whether or not to retain her, then one would expect in a separating equilibrium for too much plea bargaining to be used. A highly skilled prosecutor disposes of the cases with lacking evidence even if the quality and quantity of evidence is reasonable. She does this to increase her conviction rate and be retained. A poor prosecutor is unwilling is plea out so many cases and, knowing she will not be retained, selects the appropriate number of trials.

3.2.2 Pooling Equilibrium

The existence of pooling equilibrium where high and low-quality prosecutors achieve the same conviction rate can be identified. Denote $\overline{r}$ as the conviction rate proposed by the retention agents: a prosecutor is kept in office if the proportion of cases taken to trial that result in a nonzero sanction is greater than or equal to $\overline{r}$. What levels of $\overline{r}$ can be achieved as pooling equilibria?

As in the case when aggregate sentence length is used, any conviction rate less than $\widetilde{r}_H$ cannot arise as a pooling equilibrium. In such an outcome a prosecutor of high-quality would prefer to increase her conviction rate to $\widetilde{r}_H$.

Such a deviation results in both retention in the office and a higher utility from achieving her most preferred rate. Therefore, $\overline{r} \geq \widetilde{r}_H$.

Both types of prosecutors must be willing to obtain $\overline{r}$. Since $\overline{r} \geq \widetilde{r}_H$ consider deviations that reduce the conviction rate. For each type $\widetilde{r}_q$ is the deviation that maximizes utility (absent retention). As before, denote ϕ_q^p as the value of θ that equates the expected utility from prosecuting cases only above θ_q^p to the expected utility from prosecuting all cases with evidence better than the first-best cutoff $\widetilde{\theta}_q$ as in (10). If θ_q^e (the value of $\overline{\theta}$ that a prosecutor uses to achieve $\overline{r}$) is greater than ϕ_L^p, then a prosecutor of quality q is unwilling to achieve $\overline{r}$. Furthermore, denote r_q^p as the conviction rate that arises if the prosecutor uses the cutoff ϕ_L^p.

Consequently, for $\overline{r}$ to be a pooling equilibrium $\overline{r}$ must be less than r_L^p so the prosecutor is willing to increase her conviction rate to be retained. Similarly, a high-quality prosecutor must be willing to prosecute only those cases where $\theta \geq \phi_H^p$. If $\overline{r} = \widetilde{r}_H$, then trivially she is uninterested in deviating. Instead, if $\overline{r} > \widetilde{r}_H$, then she may prefer to deviate. If the retention agents believe that such a deviation is done by a high-quality prosecutor, then any $\overline{r}$ strictly greater than $\widetilde{r}_H$ fails to be a pooling equilibrium and $\overline{r} = \widetilde{r}_H$ is the unique outcome. If the retention agents believe that any deviation to a conviction rate less than $\overline{r}$ is done by a low-quality prosecutor, then a high-quality one must prefer achieving $\overline{r}$ (and being retained) to $\widetilde{r}_H$ (and not). In this case a high-quality prosecutor is willing to do so only if $\overline{r} \leq r_H^p$. Since high quality is identified as being more successful in the courtroom, it follows that $r_H^p > r_L^p$.

Proposition 4 *Suppose retention agents use the conviction rate to retain*

prosecutors. If they believe deviations to lower levels are done by low-quality prosecutors, then there exists a range of conviction rates, $[\widetilde{r}_H, r_L^p]$*, in which pooling equilibria exist. If they believe such deviations are done by high-quality prosecutors, then the unique pooling equilibrium is for the prosecutor to obtain a conviction rate of* $\widetilde{r}_H$*. Furthermore, all pooling equilibria involve an insufficient number of trials and too much plea bargaining.*

Just as is the case with the separating equilibria, pooling equilibria involve too much plea bargaining and too few trials. Here a low-quality prosecutor increases the number of cases she disposes of via plea bargaining to obtain the conviction record that a high-quality prosecutor is able to achieve.

Again, it is instructive to consider the first period welfare generated in these equilibria. As before, all pooling equilibria generate a greater welfare than any separating equilibrium. The conviction rate in a pooling equilibrium is less and closer to the first best than any one of the separating equilibria. Again, as well, the value in the separating equilibria is that the quality of the incumbent prosecutor can be detected. High-quality prosecutors can be retained, while poor ones can be removed. Thus, second-period welfare is greater leaving an ambiguous result on total welfare.

4 Optimal Contract

The previous analysis identifies the outcomes that can be achieved if only a single metric is used to evaluate the prosecutor. However, this may not be the best that can be achieved under asymmetric information. Retention agents may use a combination of the two evaluation criteria to evaluate the

prosecutor. Is there a metric that combines the two measurements to improve net welfare?

The answer to the question is yes. In fact, in this environment there exist a set of cutoff measures that can achieve the first-best outcome. The intuition for this result is rather straightforward and instructive. As shown in the previous analysis an important feature of the two evaluation tools (aggregate sentence length and conviction rate) is that they, independently, lead to distortions in opposing directions. The use of aggregate sentence length encourages prosecutors to inflate this measurement by taking to court those cases where the expected sanction is greater than could be achieved via plea bargaining, but may not be justified given the additional costs incurred. In short, too many cases go to trial. The use of the conviction record provides prosecutors the incentive to inflate this metric by keeping cases with a lower probability of success out of the courtroom. Hence, too few cases go to trial. By requiring the prosecutor to succeed in both dimensions, and success in a dimension comes at the expense of success in the other dimension, a separating equilibrium in which prosecutors of all levels of skill select the first-best outcome can be achieved.

To illustrate this intuition we propose a specific evaluation metric that combines the two previously analyzed. Many such combinations, though, could be constructed. Therefore, consider the following "contract". To be retained in office the retention agents require the aggregate sentence length be at least $\widetilde{X}_H$ (so that $X^e = \widetilde{X}_H$). Clearly, a high-quality prosecutor finds it in her best interest to take to trial cases if and only if $\theta > \widetilde{\theta}_H$ $(= \theta^e_H)$, as previously shown. As discussed, though, a low-quality prosecutor has the

incentive to mimic a better prosecutor by taking more cases to trial so as to achieve $\widetilde{X}_H$ herself. To do this, though, her conviction rate, r_L^e, is quite low. More formally, $r_L^e < r_H^e = \widetilde{r}_H$. Therefore, if the retention agents also require the conviction rate to be at least as great as r^* for any $r^* \in (\widetilde{r}_L, \widetilde{r}_H]$, then the behavior of a high-quality prosecutor would remain unchanged since she is achieving $\widetilde{r}_H$ by using $\overline{\theta} = \widetilde{\theta}_H$. A prosecutor of low quality is unable to achieve both $X \geq \widetilde{X}_H$ and $r \geq r^*$. Since retention is not possible, she selects her most preferred outcome, which is the first-best outcome. Thus, the first best is achieved with such a combination metric.

As stated, there are many measures that can achieve the first-best outcome. As another example, one that requires $r \geq \widetilde{r}_H$ along with $X \geq X^*$ where $X^* \in \left(\widetilde{X}_L, \widetilde{X}_H\right]$ generates the first best. What is common among all of these contracts is that the agent meets or exceeds the standard with one metric, while the agent meets or just falls short in the other metric. The shortcoming in the second measurement must allow for success to be attainable for the high-quality agent, while unobtainable for the poor one. Again, it is also worthwhile to point out that the unique feature of the two measurements is that they are substitutes: increasing the conviction rate comes at the expense of shorter aggregate sentence lengths. If two measures were used that were complements, conviction rate and acquittal rates for example, one should not expect to be able to achieve the first best as mimicking the skilled prosecutor in one measurement coincides with success in the other measurement.

5 Conclusion

A number of measures can be used to evaluate the performance of public prosecutors. Such tools serve as signals to the retention agents conveying information on the unknown skill of the incumbent. This opens up the possibility of distortions in the criminal justice system. In a rather straightforward theoretical model the nature of these potential distortions is investigated. Two evaluation criteria are considered and each, independently, is shown to affect the number of cases taken to court relative to those plea bargained and the direction of the effect depends on which is used. Importantly, it is shown that an optimal contract does indeed exist. Such a contract combines the conviction rate and the aggregate sentence length to effectively distinguish high-quality and low-quality prosecutors.

There are a number of features of the model that are integral to the results provided. First, in the absence of retention motivations prosecutors have society's well-being as their primary motivation. Consequently, a tool that eliminates the distortions caused by the evaluation immediately leads the prosecutor to select the first-best outcome. The environment considered does not incorporate ideology, for example. Additionally, the assistant prosecutors who are hired by the elected, 'head' prosecutor may have objectives that differ substantially. They may be interested in improving themselves in the external labor market. For example, a less-experienced attorney may be interested in taking a particular case to court to gain courtroom experience that is valuable to private sector law firms. Second, the driving feature of the two measurements considered is that they are, in essence, substitutes; improving one's performance in one variable reduces performance in

the other. If prosecutors differ in their ability, then lower quality agents are unable to mimic higher quality individuals in both dimensions. Third, there are numerous considerations not included in the analysis. Examples include the decision of whether to file charges, which charges to file, the allocation of cases within a prosecutor's office, the inclusion of lesser offenses, and whether convictions as charged are achieved. Expanding the environment will enrich the analysis, but should preserve the distortions created by the evaluation process, which is the primary result identified here. Similarly, another important feature of prosecutorial performance is the effort exerted. Bibas (2009) emphasizes the importance of investigation, research, diligence, zeal, and integrity. A complete analysis will incorporate incentives for effort into the optimal contract in the signalling environment.

The work highlights the potential distortions caused by reasonable evaluation tools and describes the optimal contract that can be set by retention agents. The results do not describe, though, how such a contract is to be implemented. In the U.S. a vast majority of states use plurality voting to retain an incumbent or install the challenger. Potentially it falls on the candidates themselves, the media, and special interest groups to bring to light the merits and deficiencies of the incumbent prosecutor. White (2009) highlights potential inadequacies with the information available to the public via the popular press. Consequently, incumbents are retained with a very high probability and many run in uncontested elections.[13] It is unclear in the environment studied whether prosecutors appointed, elected in a nonpartisan

[13] A sample of ten states over ten years is collected. He finds that incumbents who seek reelection are retained in 95% of elections and 85% of these general elections are uncontested.

contest, or elected in a partisan contest are more likely to be evaluated by an optimal contract. These uncertainties are left for future investigation.

6 References

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