Selecting Among Acquitted Defendants:
Procedural Choice vs. Selective Compensation

by

Andrew F. Daughety and Jennifer F. Reinganum*

Abstract

We consider two means for implementing the informational benefits of the "Scottish verdict" (a three-outcome verdict) in a two-outcome legal system. Leipold proposed allowing defendants to choose to be tried under the two-outcome or the three-outcome verdict. In equilibrium, all defendants choose the three-outcome verdict, which requires a wholesale shift of the legal system (something unlikely to occur in, for example, the U.S.). Alternatively, we consider selective compensation of acquitted defendants by the jury for those believed to deserve compensation. This results in reduced informal sanctions for those selected defendants and may also lead to enhanced accountability of prosecutors.

1 Introduction

In a previous paper[1] we provide a model of plea bargaining wherein rational Bayesian (but self-interested) outside observers impose informal sanctions on both defendants and prosecutors; informal sanctions are penalties applied outside (i.e., in addition to) the traditionally-designed justice system's formal sanctions (fines or incarceration). One important result in that paper is that, in contrast with the standard two-outcome verdict (acquit/convict), the "Scottish" verdict (which partitions acquittals into those whose case was "not proven" and those adjudged "not guilty")[2] increases socially available information about defendant guilt. This, in turn, reduces errors of misclassification of (and of misapplication of informal sanctions to) defendants and prosecutors by outside observers. In this paper we extend that analysis to consider how the informational properties of the Scottish verdict can be harnessed to improve the two-outcome (hereafter: standard) verdict with respect to better classification of acquitted

* Andrew F. Daughety (corresponding author), Department of Economics and Law School, Vanderbilt University; Jennifer F. Reinganum, Department of Economics and Law School, Vanderbilt University. Prepared for the 2015 JITE Conference "Beyond Privity," Edinburgh, Scotland, June 2015, sponsored by the Max Planck Institute on Collective Goods.

1 Daughety and Reinganum (2014); hereafter: DR2014.

defendants. That is, how might we transfer what we have learned to, for example, the American criminal justice system, so as to reduce the misapplication of informal sanctions on those who are likely to be truly innocent?

To address this we consider two proposals, one procedural and one involving selective compensation. The procedural proposal, a version of which appears in Leipold (2000),[3] is to allow defendants to choose between trial under the standard verdict and trial under the three-outcome verdict. As will be seen, the equilibrium involves the defendant always choosing the three-outcome verdict, regardless of his true guilt or innocence.

The second proposal (made and detailed here) would operate within the standard verdict model, but would allow a jury, upon acquitting the defendant, to make a pre-specified (by the state) award of compensation, based on whether the jury concluded that the defendant was highly likely to be innocent. We call this "selective compensation" since not all acquitted defendants would receive jury-directed awards. In this scheme, providing compensation acts as a signal similar to the Scottish jury's finding of "not guilty" while the lack of such an award by the jury to an acquitted defendant acts as a signal similar to the Scottish jury's finding of "not proven." That is, this proposal leads to a useful distinction among acquitted defendants, reducing informal sanctions for those selected to be viewed as "not guilty."

1.1 Informal Sanctions and an Overview of Previous Results

Informal sanctions on defendants take the form of reduced opportunities for trade (broadly-construed); that is, outside observers might decline to employ, rent housing to, provide program admission to, or otherwise associate with former defendants.[4] These informal sanctions

---

[2] See Duff (1999) for an extensive discussion of the Scottish criminal jury.

[3] Also, see Bray (2005) who proposes adding the "not proven" outcome to the U.S. system.

[4] The Equal Employment Opportunity Commission reports survey results that 92% of responding employers use criminal or background checks on all or some of job candidates (http://www.eeoc.gov/laws/guidance/arrest_conviction.cfm#IIIA; accessed January 24, 2015). Only one-fourth of the states actually prohibit the use of (pure) arrest information by employers when hiring (www.nolo.com/legal-

are taken as proportional to the outside observers' posterior belief that the (former) defendant is guilty of the charged offense, which is in turn dependent on the case disposition. For instance, in the standard setting wherein the case disposition at trial is either a conviction or an acquittal, this posterior belief of guilt is higher if the defendant was convicted rather than acquitted, due to a maintained assumption that a truly guilty defendant is more likely to be convicted than is a truly innocent defendant. Importantly, the posterior belief of guilt is still positive even if the defendant is acquitted (or the case is dropped).

We also consider informal sanctions on prosecutors because sometimes innocents do get swept up into the system, and some are prosecuted (and some of those convicted), while at other times guilty defendants go free. Informal sanctions on prosecutors can take the form of a reduced likelihood of re-election or a reduced likelihood of obtaining a high-paying private-sector job. Prosecutors are assumed to face two forms of informal sanctions; first, one that is proportional to the outside observers' posterior belief that the prosecutor convicted an innocent defendant, either through a plea bargain or at trial; and second, one that is proportional (at a possibly different rate) to the outside observers' posterior belief that the prosecutor let a guilty defendant escape punishment, either through an acquittal at trial or through a dropped case.[5]

In DR2014 we determine how informal sanctions affect the plea bargaining process between a prosecutor and a defendant charged with a specific crime, when the jury uses evidence and an exogenously-determined evidentiary standard to determine whether to convict or acquit. A conviction results in a formal sanction such as a fine or jail sentence, whereas an acquittal results in no formal sanction. However, since there is hidden information (the defendant's guilt)

---

encyclopedia/state-laws-use-arrests-convictions-employment.html; accessed January 24, 2015). Recently, online websites have begun posting "mug shots" (that is, booking photographs, which are public documents) and charging for their removal, even when all charges have been dropped Segal (2013). Thus, information about prior records is readily available and individuals have incentives to make use of it.

[5] For example, after serving as District Attorney for Brooklyn, NY, for 20 years, Charles "Joe" Hynes lost reelection due to voter dissatisfaction with both his failure to pursue child sexual abuse complaints in Brooklyn's Orthodox Jewish community as well as perception that

and the trial process is subject to error, an innocent defendant may be convicted or a guilty defendant may go free, so neither outcome provides a perfect classification of the defendant. Thus, outside observers have reason to make rational assessments about the likely guilt of the defendant, which means both outcomes result in the application of informal sanctions to varying degrees. We provide a characterization of the expected total misclassification loss for outside observers.

We show that there is a unique perfect Bayesian equilibrium in the game between the defendant and the prosecutor. In equilibrium innocent defendants always reject the equilibrium plea offer made by the prosecutor,[6] whereas guilty defendants strictly mix between accepting and rejecting the offer; this mixing is just sufficient to incentivize the prosecutor to always take any defendant who rejects the offer to trial.

We next extend the model to consider the Scottish verdict, as discussed earlier. Only in the event of a guilty outcome is a formal sanction involved; however, informal sanctions will be sensitive to whether a defendant is found not proven or not guilty. We find that, relative to the standard verdict, the Scottish verdict results in a higher expected loss at trial for a truly guilty defendant and a lower expected loss at trial for a truly innocent defendant. The additional information generated by dividing acquittals into not proven and not guilty also allows the outside observers to make better inferences about the defendant's guilt. That is, our interest in the Scottish verdict derives from the fact that by sorting acquitted defendants into a subgroup that is less likely to be guilty (those found to be not guilty) and into another subgroup of those who are more likely to be guilty despite having been acquitted (the not proven outcome, where

---

he was wrongfully convicting (innocent) defendants in other cases; see Flegenheimer (2012). After losing the Democratic primary, Hynes then ran in the general election as a Republican, and lost that election as well.

[6] In the primary model, all agents are risk- and ambiguity-neutral. In a separate section of DR2014 we show how risk- and/or ambiguity-aversion can lead some innocent defendants to plead guilty. We abstract from this issue in the current paper.

the evidence is deemed insufficient to satisfy the evidentiary standard, but the defendant does not appear to be not guilty), outside observers make fewer classification errors and therefore less frequently wrongly apply informal sanctions.[7] More precisely, in DR2014 we find that, relative to the standard verdict, the Scottish verdict results in: 1) a higher equilibrium plea offer; 2) the same equilibrium behavior by defendants (that is, innocent defendants always reject the plea offer and guilty defendants randomize between accepting and rejecting the plea offer with the same probability as in the two-outcome verdict); 3) the same equilibrium behavior by the prosecutor following a plea rejection – that is, she takes the case to trial with certainty; and 4) lower expected total misclassification loss for outside observers. Thus, the Scottish verdict is justice-enhancing.

1.2 Plan for the Paper

Section 2 provides the needed notation and model detail from DR 2014. We next consider two possible mechanisms for sorting (distinguishing) acquitted defendants in the sections that follow. In Section 3 we consider the procedural scheme, suggested by Leipold (2000). He envisions the choice between trial regimes as being made either before plea bargaining, or after plea bargaining but before trial. We find that the option to choose among regimes will not actually sort guilty and innocent defendants despite the differences discussed above as to comparing expected losses between the standard and Scottish verdicts; in equilibrium, all defendants will choose the Scottish verdict. In Section 4 we consider the selective compensation scheme and find that it does provide the desired sorting of acquitted defendants, but at a cost to society (that is potentially greater than the amount of compensation). Section 5 provides a brief summary of our results.

[7] One might ask: why stop at three outcomes - why not more? Theoretically this seems quite possible, but one should expect that the jury bears a cost of further refinement of the verdict and that this cost is likely to be strictly convex in the number of sub-categories. We do not

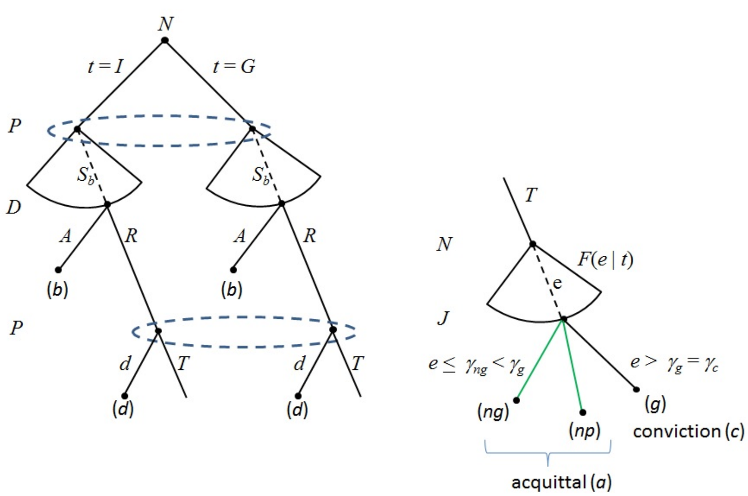
2 Review of the Previous Model and Results

In this section, we review the notation and basic model from DR2014 wherein there are two possible trial outcomes, and provide the formal results from that paper; we further review the extension of the model to the Scottish verdict.

2.1 Notation and Model Set-up

The Figure below, which is a modified version of one in DR2014, summarizes the information structure and timing of the game; the left-hand-side represents the plea bargaining portion of the game and the right-hand-side represents the trial portion.[8] We note here that there are four possible case dispositions {*a*, *b*, *c*, *d*} which represent, respectively, acquittal, bargain, conviction, and drop. The prosecutor ("she") will be represented by the symbol *P* while the defendant ("he") will be represented by the symbol *D*. *P*'s payoff represents expected utility so *P* will maximize her payoff, whereas *D*'s payoff represents expected loss, so *D* will minimize his expected loss.

Figure
Game with the Scottish Verdict



---

attempt to address the question of the optimal number of sub-categories.

[8] The "dashed" ellipses, where *P* is choosing an action, reflect *P*'s information sets (i.e., *P* does not know which node within the set she is actually standing at, since *P* does not know *D*'s type).

There are five stages in the game; in each stage one of the active "players" (P, D, and Nature, denoted N) takes an action. Following the case disposition, the outside observers impose informal sanctions based on their posterior assessments of the defendant's guilt. In Stage 1, Nature chooses D's type, which is Innocent (denoted I) with probability λ and Guilty (denoted G) with probability 1 - λ. Only D knows whether he is a G-type or an I-type; however, the probability λ is common knowledge and represents imperfections in the arrest process. In Stage 2, P makes a plea offer which is a formal sanction denoted S_b. In Stage 3, each type of D chooses whether to accept or reject the plea offer; the probability that a G-type rejects the plea offer is denoted ρ_G^D and the probability that an I-type rejects the plea offer is denoted ρ_I^D. In Stage 4, if D has rejected the plea offer, then P chooses whether to drop the case or take it to trial; let ρ^P denote the probability that P takes the case to trial (action T). In Stage 5, if the case goes to trial, then P and D individually suffer trial costs (denoted k^P and k^D, respectively),[9] and the outcome is decided by N in the guise of a jury (J) that convicts the defendant if the realized evidence exceeds an exogenously-specified threshold, or else acquits the defendant. The jury's decision-making is summarized as follows. At trial, J privately observes the evidence, denoted e, which is drawn from a distribution $F(e \mid t)$, where e is in [0, 1] and $t = G, I$. The jury convicts D if and only if $e > \gamma_c$, where γ_c is the exogenously-specified threshold for conviction (e.g., beyond a reasonable doubt); conviction results in the formal sanction for D of S_c. For the basic model, we only need to assume that $F(e \mid I) > F(e \mid G)$ for all e in (0, 1). This implies that an I-type is more likely to be acquitted than a G-type, as $F_I \equiv F(\gamma_c \mid I) > F_G \equiv F(\gamma_c \mid G)$.

We model outside observers (denoted as Θ) as having limited information on which to base their inferences about D's guilt or innocence; in particular, we assume that Θ observes only

---

[9] The costs captured in the term k^D include any direct costs of legal assistance as well as the disutility of pre-trial detention. Thus, k^D may be substantial, even when D is represented by a public defender.

the case disposition a, b, c, or d (and not the plea offer,[10] the levels of P's and D's payoffs, or the evidence draw). This allows Θ to form a posterior probability that D is a G-type, given the case disposition; this posterior belief[11] is denoted $\mu(t \mid y)$, where $t = G, I$ and $y = a, b, c, d$.

We assume that informal sanctions by Θ on D are proportional to Θ's posterior belief about his guilt. That is, following disposition y, D anticipates suffering informal sanctions in the amount $r^D\mu(G \mid y)$, where the exogenous parameter $r^D \geq 0$ denotes Θ's informal sanction rate for D.[12] This formulation implies that informal sanctions on D are higher the higher is Θ's posterior belief about his guilt. These informal sanctions are the result of Θ's self-interested decision to avoid transacting with individuals who may be guilty of this crime;[13] the more Θ believes in D's guilt, the more Θ avoids transacting with D.

Informal sanctions by Θ on P are also assumed to be proportional to Θ's posterior beliefs about D's guilt. If D is acquitted or the case against D is dropped, then P may have allowed a guilty defendant to go free. The relevant informal sanctions are given by $r_G^P\mu(G \mid y)$, for $y \in \{a, d\}$, where r_G^P denotes the sanction rate on P for freeing a G-type. On the other hand, if D is convicted or accepts a plea offer, then P may have punished an innocent defendant. The relevant informal sanctions are given by $r_I^P\mu(I \mid y)$, for $y \in \{b, c\}$, where r_I^P denotes the sanction rate on P for punishing the innocent. We assume that r_I^P and r_G^P are non-negative.[14]

---

[10] It is highly plausible that Θ would not observe a rejected plea offer. We assume that Θ observes the fact that D accepted a plea offer, but not the offer itself. We conjecture that, if Θ could observe the value of an accepted plea offer then, because there are only two types of D, this would not affect Θ's out-of-equilibrium beliefs, but we leave this as an item for future research.

[11] In particular, given any outcome, Θ will form these beliefs based on conjectures about ρ_G^D, ρ_I^D and ρ^P, and known parameters λ, F_G and F_I. See the Appendix for equations (A.1a)-(A.1d), where these beliefs are provided.

[12] We view r^D as being positive, but it could be negative (which the model allows). A negative r^D might reflect a D seeking "street cred" by being perceived as guilty of the crime, if the relevant outside observers are gang members. In addition, r^D may reflect crime-specific attributes; for instance, a heinous crime is likely to have a higher value of r^D than a petty crime. Finally, other characteristics of D may affect the magnitude of r^D. For example, a D with a history of convictions for burglary who is charged with a new burglary may have a lower r^D than that of a first-time burglary defendant, whereas a career burglar charged with a very different crime (e.g., child molestation) might still have a very high r^D.

[13] In some states, employers can be held liable if they hire someone that they knew or should have known was potentially dangerous.

[14] As with r^D, r_I^P and r_G^P may vary with the crime in question and with observable attributes of P (and possibly D).

2.2 D's Payoffs

We first describe D's payoffs, which are written in terms of expected loss. First, suppose that D's case goes to trial; this can result in outcome c (conviction) or outcome a (acquittal). Then a D of type t expects the following loss:

(1) $\pi_T^D(t) = S_c(1 - F_t) + k^D + r^D\mu(G \mid c)(1 - F_t) + r^D\mu(G \mid a)F_t,\ t = G, I.$

This expression is interpreted as follows. Going to trial costs D the amount k^D regardless of the outcome. Conviction occurs with probability $(1 - F_t)$ and results in the formal sanction S_c plus the informal sanction $r^D\mu(G \mid c)$. Conviction is not a sure sign of guilt, since an I-type could have realized evidence sufficient to convict, so $\mu(G \mid c)$ will be less than one. Similarly, acquittal is not sufficient to conclude innocence, so Θ's belief $\mu(G \mid a)$ will be positive and D will bear the informal sanction $r^D\mu(G \mid a)$ in the event of acquittal, which occurs with probability F_t.

It is straightforward to show that $\pi_T^D(I) < \pi_T^D(G)$. That is, an I-type has a lower expected loss from trial than a G-type. This follows from our assumption that an I-type is more likely to be acquitted than a G-type ($F_I > F_G$), which further implies that Θ's belief in D's guilt is higher following a conviction than an acquittal (i.e., $\mu(G \mid c) > \mu(G \mid a)$).

There are two other outcomes for which we need to define D's payoff; in the event of an accepted plea bargain, or a dropped case, D's payoff does not depend on his true guilt or innocence. If P offers a plea bargain of S_b, then D can choose to accept (A) or reject (R) the offer. D's payoff from accepting the plea offer S_b is:

(2) $\pi_b^D = S_b + r^D\mu(G \mid b).$

That is, D suffers the formal sanction S_b plus the informal sanction imposed by Θ because, having accepted the plea offer (outcome b), they believe that he is a G-type with probability $\mu(G \mid b)$. If P drops the case, then D's expected loss is:

$$\pi_d^D = r^D \mu(G \mid d),$$

which reflects Θ's belief that D might be guilty even though the case was dropped.

Finally, since P may mix between going to trial (with probability ρ^P) and dropping the case (with probability $1 - \rho^P$) following a rejected plea offer, D's expected loss following rejection (given his type) is:

$$\pi_R^D(t) = \rho^P \pi_T^D(t) + (1 - \rho^P)\pi_d^D, \; t = G, I.$$

2.3 P's Payoffs

Next we describe P's payoffs, which are written in terms of gains. P's expected payoff from trial is complicated by the fact that P and Θ can have beliefs that can differ in principle (though not in equilibrium). D's decision to accept or reject the plea offer S_b will affect P's posterior belief that D is guilty, whereas the outside observer's posterior beliefs depend only on the disposition of the case. To capture this, let $\nu(G \mid R)$ (resp., $\nu(G \mid A)$) denote P's posterior belief that D is a G-type,[15] given that he rejected (resp., accepted) the plea offer S_b. Of course, in equilibrium, P's beliefs and Θ's beliefs must be the same (and must be correct).

P's payoff from going to trial can be written as:

$$(3) \qquad \pi_T^P = \nu(G \mid R)\{S_c(1 - F_G) - k^P - r_I^P\mu(I \mid c)(1 - F_G) - r_G^P\mu(G \mid a)F_G\}$$
$$+ \nu(I \mid R)\{S_c(1 - F_I) - k^P - r_I^P\mu(I \mid c)(1 - F_I) - r_G^P\mu(G \mid a)F_I\}.$$

This is interpreted as follows. Given that D rejected the plea offer, P believes that D is a G-type with probability $\nu(G \mid R)$. She then expects a conviction with probability $1 - F_G$ and an acquittal with probability F_G. If D is convicted, P obtains utility from the formal sanction S_c but Θ holds a posterior belief $\mu(I \mid c)$ that D is nevertheless an I-type, and imposes on P the informal sanction $r_I^P\mu(I \mid c)$. If D is acquitted, then Θ holds a posterior belief $\mu(G \mid a)$ that D is nevertheless a G-

[15] P's beliefs will also depend on the plea offer S_b, but this would needlessly complicate the notation so this dependence is suppressed. The form of these posterior beliefs is provided in the Appendix.

type, and imposes on P the informal sanction $r^P_G\mu(G \mid a)$. Regardless of the trial outcome (a or c), P pays the trial costs k^P. The second part of P's payoff, wherein she believes that D is an I-type with probability $v(I \mid R)$, is interpreted analogously.

P's payoff from an accepted plea offer is:

$$\pi^P_b = S_b - r^P_I\mu(I \mid b).$$

That is, P obtains utility from the agreed-upon formal sanction S_b but also suffers an informal sanction that reflects Θ's belief in the possibility that an innocent D accepted the offer.

As an alternative to trial, P has the option to drop the case following a rejected plea offer. In this case, her payoff reflects only an informal sanction from Θ, who believes with probability $\mu(G \mid d)$ that D is a G-type, so P has allowed a guilty defendant to go free. Thus, P's payoff from dropping the case is simply:

(4) $$\pi^P_d = -\, r^P_G\mu(G \mid d).$$

As indicated earlier, since P may mix between dropping the case and going to trial, P's expected payoff following a rejection by D is given by:

$$\pi^P_R = \rho^P\pi^P_T + (1 - \rho^P)\pi^P_d.$$

2.4 Equilibrium in the Standard Verdict Model

In DR2014 we find that there is a unique perfect Bayesian equilibrium in this model. Because P would prefer to drop the case rather than taking it to trial if she (and Θ) was convinced that D was innocent, and because P would prefer to go to trial against a G-type as compared to an I-type,[16] there must be a sufficient fraction of G-types in the pool of Ds rejecting the plea offer in order to incentivize P to take the case to trial following a rejection (as P cannot

[16] See the Appendix for three "Maintained Restrictions" on the parameters. This sentence reflects two of the restrictions; the third is that if plea bargaining were not allowed (or always failed), then P would prefer to take the case to trial rather than dropping it.

commit in advance to do so).[17] Thus, in equilibrium, *P* makes a plea offer that renders the *G*-type indifferent between accepting and rejecting the plea offer; the *I*-type always rejects this plea offer; and *P* takes the case to trial with probability 1 following a rejection, although *P* is indifferent between trial and dropping the case (that is, *P* is "barely incentivized" to take the case to trial following a rejection).

In order to make *P* indifferent between trial and dropping the case, the payoffs for *P* in equations (3) and (4) must be equal.[18] This means that the *G*-type must reject the plea offer with probability $\rho_G^D = \rho_G^{D0}$, where:

(5) $\rho_G^{D0} = - \lambda[(S_c - r_I^P)(1 - F_I) - k^P]/(1 - \lambda)[(S_c + r_G^P)(1 - F_G) - k^P]$,

which is easily shown to be a positive fraction.

In order to make the *G*-type indifferent between accepting and rejecting the plea offer (anticipating that trial will follow), it must be that the *G*-type's payoffs in equations (1) and (2) are equal. Since accepting the plea offer is a clear sign of guilt (in equilibrium all *I*-types reject; see footnote 6 above for modifications to allow some *I*-types to accept the offer), it follows that $\mu(G \mid b) = 1$. Thus, the equilibrium plea offer, $S_b(\rho_G^{D0})$, is such that: $S_b(\rho_G^{D0}) + r^D = \pi_T^D(G; \rho_G^{D0})$, where $\pi_T^D(G; \rho_G^{D0})$ is equation (1) with the beliefs evaluated at $\rho_G^D = \rho_G^{D0}$. Upon solving we obtain the equilibrium plea offer $S_b(\rho_G^{D0}) = \pi_T^D(G; \rho_G^{D0}) - r^D$. Notice that *P* must discount the plea offer to reflect the informal sanctions that *D* expects to incur by accepting it.

Finally, in DR2014, we also assume that the outside observers recognize that they will sometimes under-sanction, and sometimes over-sanction, defendants (and prosecutors) because trial does not distinguish perfectly between *G*-types and *I*-types. We derive the expected

---

[17] Early models of plea bargaining assumed that *P* was committed to taking any *D* who rejected the offer to trial; see Landes (1971), Grossman and Katz (1983) and Reinganum (1988). Using the same logic that Nalebuff (1987) developed in the civil lawsuit setting, Franzoni (1999), Baker and Mezzetti (2001), and Bjerk (2007) provide models wherein *P*'s inability to commit to trial results in an incentive constraint.

[18] In equating these two payoffs, we use $(\rho_G^D, \rho_I^D) = (\rho_G^D, 1)$ to construct both *P*'s beliefs and Θ's beliefs. Solving the resulting equation yields the formula for ρ_G^D given in equation (5).

misclassification loss for Θ, $M(\rho_G^{D0})$, and show that this expected loss is increasing in ρ_G^{D0}. Thus, the outside observer prefers a society with more successful plea bargaining. For a discussion of comparative statics results in this model, see DR2014.

2.5 Modifications of the Previous Model for the Scottish Verdict and Some Results

In DR2014, we extend the foregoing analysis so as to incorporate the Scottish verdict. We represent the Scottish verdict by the triple $\{ng, np, g\}$, with the obvious interpretation, and assume $\gamma_g \equiv \gamma_c$ (that is, the evidentiary standard for a conviction under the previous two-outcome verdict is used to find a defendant "guilty" under the Scottish verdict). Further, let γ_{ng} be the cutoff for not guilty versus not proven, where $0 < \gamma_{ng} < \gamma_g$. Thus, we extend the previous notation so that $F_t(\gamma_g) \equiv \Pr\{e \leq \gamma_g \mid t\}$ and $F_t(\gamma_{ng}) \equiv \Pr\{e \leq \gamma_{ng} \mid t\}$, for $t = G, I$. Finally, let $\Delta_t \equiv F_t(\gamma_g) - F_t(\gamma_{ng})$, $t = G, I$.

We now need somewhat more structure on the distribution of evidence $F(e \mid t)$. We assume that F is differentiable in e and that the strict monotone likelihood ratio property (*SMLRP*) holds:

ASSUMPTION: *SMLRP: $f(e \mid G)/f(e \mid I)$ is strictly increasing in e, for e in (0, 1).*

It is straightforward to show that Θ's posterior belief that D is a G-type,[19] having observed one of the mutually-exclusive outcomes ng, np, or g, satisfies: $\mu(G \mid ng) < \mu(G \mid np) < \mu(G \mid g)$; and that an I-type's expected loss from proceeding to trial is strictly lower than a G-type's expected loss from proceeding to trial, where $\tilde{\pi}_T^D(t)$ denotes the expected loss for a D of type t under the Scottish verdict:[20]

$$\tilde{\pi}_T^D(t) = S_c(1 - F_t(\gamma_g)) + k^D + r^D\mu(G \mid g)(1 - F_t(\gamma_g)) + r^D\mu(G \mid np)\Delta_t + r^D\mu(G \mid ng)F_t(\gamma_{ng}). \tag{6}$$

[19] See the Appendix for the specific formulas for these posterior beliefs, equations (A.2a)-(A.2e).

[20] We will use a tilda (~) to demarcate those payoffs, strategies, etc., that are developed for the Scottish verdict, so as to act as a visual

The ordering of payoffs indicated above means that the equilibrium still involves *I*-types always rejecting the plea offer and *P* (though indifferent) always taking any *D* who rejects a plea offer to trial, while *G*-types mix between accepting the plea offer and rejecting it with some probability ρ_G^D.

P's expected payoff from trial, extended to allow for the three outcomes, is:

$$(7) \quad \tilde{\pi}_T^P = \nu(G \mid R)\{S_c(1 - F_G(\gamma_g)) - k^P - r_I^P\mu(I \mid g)(1 - F_G(\gamma_g)) - r_G^P\mu(G \mid np)\Delta_G - r_G^P\mu(G \mid ng)F_G(\gamma_{ng})\}$$

$$+ \nu(I \mid R)\{S_c(1 - F_I(\gamma_g)) - k^P - r_I^P\mu(I \mid g)(1 - F_I(\gamma_g)) - r_G^P\mu(G \mid np)\Delta_I - r_G^P\mu(G \mid ng)F_I(\gamma_{ng})\}.$$

Although it is not at all obvious, it turns out that (after substituting for the beliefs $\nu(G \mid R)$ and $\mu(G \mid \cdot)$ in terms of the rejection rate ρ_G^D)[21] this function turns out to be independent of γ_{ng}, and precisely equals π_T^P in equation (3). This means that *P* is made indifferent between dropping and going to trial by the same ρ_G^D as in the standard verdict regime: that is, $\rho_G^D = \rho_G^{D0}$ provides the equilibrium rejection probability for a *G*-type. This happens because *P*'s computed expected payoffs from trial end up simply reflecting whether *D* is found guilty or is acquitted (i.e., found either not proven or not guilty).

The equilibrium plea offer under the Scottish verdict is given by $\tilde{S}_b(\rho_G^{D0}) + r^D = \tilde{\pi}_T^D(G;\rho^0)$, where $\tilde{\pi}_T^D(G;\rho_G^{D0})$ is equation (6) with beliefs evaluated at $\rho_G^D = \rho_G^{D0}$. Since $\gamma_g = \gamma_c$, the difference between $\tilde{\pi}_T^D(G;\rho_G^{D0})$ and $\pi_T^D(G;\rho_G^{D0})$ is equal to the difference between informal sanctions of $r^D\mu(G \mid np)\Delta_G + r^D\mu(G \mid ng)F_G(\gamma_{ng})$ and informal sanctions of $r^D\mu(G \mid a)F_G(\gamma_g)$. Under *SMLRP*, this difference is positive (see the online Technical Appendix to DR2014). That is, the equilibrium plea offer under the Scottish verdict is higher than the equilibrium plea offer under

---

cue when later making comparisons with similar terms developed for the standard verdict.

[21] We use $(\rho_G^D, \rho_I^D) = (\rho_G^D, 1)$ to construct Θ's beliefs, now employing equations (A.2a)-(A.2e), and *P*'s beliefs, as specified in the

the standard verdict, whereas they are both accepted with the same equilibrium probability. Finally, the expected misclassification loss for Θ, $\widetilde{M}(\rho_G^{D0})$, is now lower because the Scottish verdict does a better job at distinguishing between *G*-types and *I*-types.

In summary: 1) *G*-types prefer the standard verdict; 2) *I*-types prefer the Scottish verdict; 3) *P* prefers the Scottish verdict (as she obtains a higher plea offer with the same frequency); and 4) Θ prefers the Scottish verdict (as the expected loss from misclassification is lower).

3 Procedural Choice as a Means for Sorting Among Acquitted Defendants

Leipold (2000) proposes that defendants be allowed to choose whether to proceed under the standard verdict or a three-outcome verdict, with the third outcome being one of "innocence."[22] He focuses on the defendant's choice of procedure (i.e., choose the standard verdict or, from our perspective, the Scottish verdict) being made immediately following the defendant's being charged, but also considers the possibility that it is made immediately before going to trial. He argues (p. 1340) that:

> " ... anything that makes the right to a trial more valuable (here, the possibility of vindication) also means that defendants will demand more to relinquish that right. Anything that makes a trial more costly for the government (a possible finding that an innocent person was charged) should increase what a prosecutor is willing to pay to avoid trial. Thus, under the proposal a defendant should demand more in charge or sentencing concessions before pleading guilty, and prosecutors should be more willing than before to make additional concessions."

Translated into our terminology and framework, he predicts that in the three-outcome regime, as compared to the standard regime: (1) the trial option will be more attractive to *D* (owing to the chance of vindication); and (2) the three-outcome regime is more costly for *P*; and (3) both of these imply that *P* will make a lower plea offer in the three-outcome regime.

Appendix. Equating *P*'s payoff from trial with her payoff from dropping the case, and solving for ρ_G^D, yields exactly the same formula as in equation (5).

[22] We avoid using the word "innocence" as a verdict outcome which, after all, is based on inference; we reserve this word for *D*'s type *I* (which the jury cannot observe). In the three-outcome case we will think of Leipold's use of the word "innocence" as meaning "not guilty" in

With regard to item (1), we showed in DR2014 that trial is more attractive only for innocent defendants, as they are more likely to end up in the "not guilty" category than are guilty defendants. Trial is a less attractive option for guilty defendants, who are more likely to end up in the "not proven" category than are innocent defendants. With regard to item (2), we find that (in equilibrium) the prosecutor's expected payoff from trial is the same in both regimes. Finally, with respect to item (3), since the plea offer is tailored to the trial prospects of the guilty type, the plea offer is higher in the three-outcome regime than in the standard regime.

However, this comparison between the two exogenous regimes ignores the possible informational effects that flow from the choice of regime itself.[23] If we consider the choice by D between the standard verdict and the Scottish verdict, we obtain the following result.

PROPOSITION 1: *There is a unique (refined) equilibrium wherein D, independent of type, chooses the Scottish verdict. In that equilibrium, all I-types reject the plea offer while the fraction* ρ_G^{D0} *of G-types reject the plea offer, where that plea offer is* $\widetilde{S}_b(\rho_G^{D0}) = \widetilde{\pi}_T^D(G; \rho_G^{D0}) - r^D$. *Furthermore, P chooses trial if D rejects her plea offer.*

Notice that this holds despite the previously-observed result that, relative to the standard verdict, *G*-types are worse off under the Scottish verdict whereas *I*-types are better off under the Scottish verdict. It also holds whether the choice is made immediately before plea bargaining or immediately before trial. The basic intuition is that while *G* might seemingly wish to defect to choosing the standard verdict, *I* does not, so choosing the standard verdict reveals *D* to be a *G*-type, making *D* yet worse off. Thus, for example, if the choice is made before plea bargaining, then *P*'s plea offer and the outside observer's beliefs will treat *D* as a *G*-type for sure.

---

the Scottish verdict sense: a suitably high probability, based on the evidence, that *D* is far from the set of those who will be convicted.

[23] Although Leipold recognizes that juries might draw an adverse inference from a defendant's choice not to seek vindication, he argues that juries can be instructed to draw no inference from the defendant's choice of regime (pp. 1343-1344). However, he does not fully incorporate the effect of adverse inferences by *P* and *Θ*, which will have a significant impact on the plea offer and on post-trial informal

The proof is somewhat long and a bit convoluted, because we must allow for a number of alternative candidate equilibria which must be evaluated.[24] As an example of the analysis, consider the purported equilibrium in the Proposition, wherein *D* chooses whether he will be tried under the standard verdict or the Scottish verdict, and assume this choice is before any plea bargaining occurs. Suppose that both a *G*-type and an *I*-type choose the Scottish verdict; thus the mixture among those choosing the Scottish verdict is the same as the prior mixture (that is, a fraction λ are *I*-types and 1 - λ are *G*-types). Then their anticipated payoffs are given by the Scottish verdict equilibrium wherein an *I*-type rejects the offer (for sure), as does a *G*-type with probability ρ_G^{D0}. Now consider what happens if a *D* deviates to choosing the standard verdict (an out-of-equilibrium move). If *P* and Θ believe that this deviation comes from both types in the prior mixture, then *D*'s anticipated payoffs are given by the standard verdict equilibrium wherein an *I*-type rejects the offer (for sure), as does a *G*-type with probability ρ_G^{D0}.

Holding beliefs constant this way means that this deviation would be attractive to the *G*-type but not to the *I*-type. Updating beliefs marginally in the direction of the *G*-type would leave this preference ordering unchanged. No matter how much these beliefs were updated in the direction of the *G*-type, the *I*-type would not find the deviation attractive. Indeed, if these beliefs were updated sufficiently in the direction of the *G*-type, even the *G*-type would not find the deviation attractive. In particular, updating beliefs to place all of the probability on type *G* would deter *G* from making this deviation. This is because (following the deviation) *P* would make the plea offer[25] of $S_b = S_c(1 - F_G(\gamma_g)) + k^D$, which is larger than the plea offer in the Scottish verdict (see the Technical Appendix for this offer). On the other hand, updating beliefs

sanctions.

[24] Due to space limitations, we have placed the entire proof and a discussion in a Technical Appendix on the web, available at http://www.vanderbilt.edu/econ/faculty/Daughety/DR-SelectingAmongtheAcquitted-TechApp042015.pdf

[25] Technically, the plea offer is: $S_b = S_c(1 - F_G(\gamma_g)) + k^D + r^D\mu(G \mid g)(1 - F_G(\gamma_g)) + r^D\mu(G \mid ng)F_G(\gamma_g) - r^D$. However, if *P* and Θ believe that *D* is type *G* with probability 1 following this deviation to the standard verdict, then the last three terms sum to zero.

marginally in the direction of the *I*-type would also leave this preference ordering unchanged. No matter how much these beliefs were updated in the direction of the *I*-type, the *G*-type would find the deviation attractive. Indeed, if these beliefs were updated fully in the direction of the *I*-type, then even the *I*-type would find signaling his innocence through this deviation attractive (as *P* would ultimately drop the case and Θ would not impose sanctions).

However, whenever an *I*-type would be willing to make this deviation, a *G*-type would strictly prefer to make the deviation. The D1 equilibrium refinement (Cho & Kreps, 1987) then requires that out-of-equilibrium beliefs attribute this deviation to type *G*. Basically, if both types are (in equilibrium) choosing the Scottish verdict, then deviating to the standard verdict is a clear signal of type *G* (under the refinement), which is then met with harsh informal sanctions and a higher plea offer. This is sufficiently disadvantageous to deter type *G* from deviating to the standard verdict from the Scottish verdict. Even though *G* prefers that *both D*-types be subject to the standard verdict, he will not unilaterally choose it if the *I*-type is not compelled to choose it as well. Thus, there is a (refined) equilibrium wherein both types of *D* choose the Scottish verdict. As discussed in the Technical Appendix, this configuration (wherein both types choose the Scottish verdict) is the unique equilibrium when the choice is made before plea bargaining and this is also true if the choice is made after a rejection of the plea offer and after *P* has decided to proceed to trial (i.e, just before trial).

Barbato (2005, Section 3.B) raises a fundamental problem with employing the Scottish verdict in the U.S. setting. After discussing a few unsuccessful efforts (primarily in Georgia and California) to include a not-proven outcome, Barbato cites a decision[26] by the U.S. Third Circuit Court of Appeals in an appeal requesting dismissal of an indictment following a trial on

---

[26] *United States v. Merlino*, 310 F.3d 137, 144 (3rd Cir. 2002).

predicate acts, with that trial marred by problems with jury instructions. The jury had responded to questions about whether various counts had been proven or not proven. The majority opinion held that it was unclear as to whether the jury response was based on unanimity (as should have been required) and was therefore not necessarily indicative of unanimous acquittal on the predicate counts in question. This example, plus the failed previous efforts, potentially suggest that a Scottish verdict is unlikely to be implementable in the U.S.[27]

4 Selective Compensation as a Means for Sorting Among Acquitted Defendants

As an alternative policy, we now consider the following modification of the standard verdict: after a jury[28] decides whether *D* is to be acquitted or convicted, but before announcing the outcome, it further considers whether or not to award state-specified compensation of *K* to *D* if the evidence fell into what we earlier referred to as the "not guilty" category for the Scottish verdict. That is, if $e \leq \gamma_{ng}$, the jury awards compensation in the amount *K* to *D*; if $\gamma_{ng} < e \leq \gamma_g$, then *D* is acquitted, but does not receive compensation.

We take *K* as exogenously determined, much as the sentence S_c is exogenously determined, and one might argue for the joint choice by a central planner of (S_c, K).[29] One might expect that *K* is at least k^D, but it might also include other social losses (e.g., lost productivity from inefficient labor matching), so we assume that $K > 0$.[30] Three points are worth observing about the realism and value of this scheme. First, juries choose awards in civil cases every day; they receive guidance from suggestions made by the litigants, but there is no question that choosing whether to make an award (especially if the amount is pre-determined) is a

---

[27] At least one current U.S. Supreme Court Justice is on record as opposed to implementing the Scottish verdict; see Pinsky (1995) which includes a quote on this topic from an interview with Justice Antonin Scalia.

[28] This could, alternatively, be a judge in a bench trial, who fulfills the role of fact-finder. We use jury as synonymous with fact-finder.

[29] The choice by society of *K* and S_c is beyond the current paper's focus.

[30] Note that the social planner's problem involved in picking (S_c, K): 1) allows for $K = 0$ as a subcase; 2) presumably would pick $K > 0$ since the misclassification problems associated with informal sanctions would be reduced if the jury can signal information about *D*'s potential innocence through this means. Moreover, a standard verdict regime with $K = 0$ has no means to distinguish those who should be thought of as in

function they can perform. Second, it is the jury in this particular case that has heard the evidence and that is therefore likely to be best-positioned to make the award/no-award decision. Appellate courts generally give deference to the assessment of evidence by the fact-finder in a case (civil or criminal), since there is relevant content in the provision of evidence that has to do with the on-site evaluation of the credibility of the evidence, something that is not likely to be well-captured by the record of the trial. This is why such a two-stage assessment with the same fact-finder should be preferred to a separate (post-acquittal) trial to evaluate whether a defendant should be declared "innocent."[31] Third, the evidentiary standard being used by the jury is, once again, γ_{ng}, which is below "beyond a reasonable doubt" (γ_g) but otherwise taken (in the analysis) as arbitrary – that is, we are looking for results that do not depend upon a specific value of γ_{ng}.

4.1 D's Losses Under Selective Compensation

Expanding on the earlier notation from Section 2, let $\pi_T^D(t, K)$ denote the expected payoff from trial to a defendant of type t, if his loss is reduced by K should the jury choose to make an award of compensation. Since the award partitions the set of acquitted defendants as discussed above, then it is straightforward to show that:

(8) $$\pi_T^D(t, K) = \tilde{\pi}_T^D(t) - KF_t(\gamma_{ng}),\ t = G, I,$$

where $F_t(\gamma_{ng})$, $t = G, I$, is the probability that the jury observes $e \leq \gamma_{ng}$, and therefore awards compensation. Recalling the earlier assumption that $F(e \mid I) > F(e \mid G)$, this means that while the expected compensation for a G-type is less than that for an I-type, G-types still may benefit from a lucky draw of e and therefore receive compensation if they choose to go to trial.

Using equation (8) and holding ρ_G^D fixed, it is now simple algebra to show that the "gap"

the not guilty category and those that should be thought of as in the not proven category.

[31] California allows for this procedure (with the second step a bench trial); see Leipold (2000), Section I.B.4. As Leipold notes, this procedure imposes a very high burden of proof on the defendant and is rarely used.

between the losses for a G-type and an I-type are ordered for the alternative verdict regimes as follows:

$$\pi_T^D(G, K) - \pi_T^D(I, K) > \tilde{\pi}_T^D(G) - \tilde{\pi}_T^D(I) > \pi_T^D(G) - \pi_T^D(I) > 0.$$

That is, the net expected loss to a G-type versus an I-type is largest under the selective compensation model, next largest under the Scottish verdict, and smallest (but still positive) under the standard verdict.

We later consider the effect of K on P's payoff; for now assume there is no such effect.[32] How does K affect the equilibrium plea offer? Despite the above ordering, this turns out to depend upon the parameters of the problem. To see why, recall that a D of type G incurs a larger expected loss under the Scottish verdict than under the standard verdict because more precise information is revealed by the Scottish verdict, and this leads to a higher equilibrium plea offer under the Scottish verdict when compared with the standard verdict. The selective compensation verdict also involves more information release, but this can be counter-balanced by the size of K, so the overall effect of K on a G-type's expected loss, and therefore on the size of the equilibrium plea offer (in comparison with the standard verdict) depends upon the parameters of the problem. More precisely, as long as K does not affect P's payoff (we return to this issue below), then it can be shown that, for fixed ρ_G^D, $\pi_T^D(G, K) \gtrless \pi_T^D(G)$ if and only if:

$$K \lessgtr K^0 \equiv r^D\{\mu(G \mid np)\Delta_G + \mu(G \mid ng)\, F_G(\gamma_{ng}) - \mu(G \mid a)F_G(\gamma_g)\}/F_G(\gamma_{ng}),$$

where the term in braces is the informational gain, and is therefore positive. In other words, if K is sufficiently small, then $\pi_T^D(G, K) > \pi_T^D(G)$, allowing for equilibrium plea offers under the selective compensation verdict to be higher than those under the standard verdict. If K is

[32] This means that the equilibrium rejection probability is still ρ_G^{D0}.

sufficiently large, this result is reversed, so plea offers under selective compensation have to be reduced in level from those under the standard verdict: a "premium" is used to induce a G-type to accept the plea offer.

4.2 P's Payoff Under Selective Compensation

Now consider how compensation of D may affect P. It is possible that, since K is provided by the state, there is an effect of K on P. Perhaps the state requires that P's office must cover some or all of the award K. Or, if that is not the case, a more subtle cost might come from the electorate or P's superiors: if P frequently brought cases wherein the jury awarded compensation to D, someone campaigning for P's job might make the argument (to the electorate, or to P's superiors) that P was doing a poor job.[33] This would provide a means for increasing P's accountability (to the electorate or to her superiors) for proper performance of her job in terms of her choices to bring cases to trial.

We incorporate the possibility of this effect of K on P's payoff as follows. First, denote P's payoff under selective compensation, with an arbitrary probability that a G-type rejects the plea offer of ρ_G^D, as $\pi_T^P(\rho_G^D, \alpha K)$, where α is a non-negative parameter reflecting the degree to which P's payoff is reduced by K. Thus, if P's payoff is unaffected by K (as was assumed near the end of the previous subsection) then $\alpha = 0$. If P is effectively charged for the full level of compensation (e.g., her office must pay the compensation), then $\alpha = 1$. One could imagine circumstances wherein $0 < \alpha < 1$ (perhaps the electorate is forgetful about some cases wherein D received compensation) or perhaps $\alpha > 1$ (perhaps the electorate penalizes P yet more than K; this would be a sort of "punitive damages" story). Note that we have augmented the notation with the G-type's rejection probability, ρ_G^D, since we will need to find the equilibrium rejection

[33] For example, if this policy was in use over many jurisdictions, a P's record in a jurisdiction could be compared with those of Ps in other, similar, jurisdictions.

probability with P's payoff now influenced by K. Again, since the selective compensation verdict involves the release of information that occurs under the Scottish verdict, we employ equation (7) from the Scottish verdict discussion in Section 2 and obtain:

$$\pi_T^P(\rho_G^D, \alpha K) = \tilde{\pi}_T^P(\rho_G^D) - \alpha K\{F_G(\gamma_{ng})v(G \mid R; \rho_G^D) + F_I(\gamma_{ng})v(I \mid R; \rho_G^D)\},$$

where the right-hand-side is explicitly shown as a function of ρ_G^D. Equation (4) gives the expected payoff to P from dropping; this has not changed (though it too depends upon ρ_G^D) and as was discussed in Section 2, the equilibrium value of ρ_G^D is found by making P indifferent between the expected trial payoff, $\pi_T^P(\rho_G^D, \alpha K)$, and the expected payoff from dropping. This tedious exercise in algebra yields the equilibrium rejection probability for a G-type, denoted $\rho_G^D(\alpha K)$, as:

(9) $\rho_G^D(\alpha K) = - \lambda[(S_c - r_I^P)(1 - F_I(\gamma_g)) - k^P - \alpha K F_I(\gamma_{ng})]/(1 - \lambda)[(S_c + r_G^P)(1 - F_G(\gamma_g)) - k^P - \alpha K F_G(\gamma_{ng})]$.

A comparison between equation (5) in Section 2 and equation (9) reveals that: 1) the two equations only differ by the $\alpha K F_t(\gamma_{ng})$ terms in the numerator and denominator; and 2) this makes it immediate that when $\alpha = 0$, $\rho_G^D(0K) = \rho_G^{D0}$, which is the G-type's rejection probability in both the standard and Scottish verdict models. Recalling the discussion of plea offers at the end of the previous subsection, this means that when P's payoff is not influenced directly by K (i.e., $\alpha = 0$), a G-type will reject plea offers at the same rate under the standard, Scottish, and selective compensation verdicts. Moreover, it is easy to show that $\rho_G^D(\alpha K)$ is increasing in α: the greater the impact of K on P's payoff, the greater the incentive P has to increase the proportion of G-types seeking trial.

We summarize the selective compensation verdict result in the following Proposition.

PROPOSITION 2. *Let K be an exogenously-specified award from the state to D if the jury finds* $e \leq \gamma_{ng}$ *and assume that P incurs the loss* αK *if this award is made. Then:*

1) if $\alpha = 0$, *a G-type rejects the plea offer with probability* ρ_G^{D0}, *which results in the same* *expected misclassification loss as the Scottish verdict (which is lower than that of the standard verdict) and the same trial costs as the standard verdict. The plea offer could be higher or lower than in the standard verdict, depending on* $K \lesseqgtr K^0$.

2) if $\alpha > 0$*, a G-type rejects the plea offer with probability greater than* ρ_G^{D0}*, leading to higher trial costs than the standard verdict and greater total misclassification loss than under the Scottish verdict.*

Furthermore, to the degree that we interpret increasing α as reflecting increased effort to expose *P* to electoral (or supervisory) censure, this means that outside observers will increase their Bayesian beliefs $\mu(G \mid y)$, $y = ng$, np, or g, about the likely guilt of any *D* who goes to trial, thereby subjecting those *I*-types who have been arrested (and, in equilibrium, will always reject *P*'s offer and proceed to trial) to greater informal sanctions. This last, seemingly perverse result (that holding *P* more responsible for cases found "not guilty" leads to a greater imposition of informal sanctions on *I*-types) suggests two important caveats. First, we have not attempted to include effort on *P*'s part to reduce the likelihood that an *I*-type is dragged through the justice system. If *P* could apply effort to reduce the influx of *I*-types, the αK-incentive would encourage effort to achieve a reduction in λ, which would reduce the likelihood that it is an *I*-type who, though acquitted, is still subject to high informal sanctions.

Second, we have not considered what happens if *P*, and possibly *D*, were to receive new information (after plea bargaining but before trial) that suggests a higher probability that *D* is innocent.[34] There are a few papers in the literature that, while not considering informal sanctions or modifications of the jury's choices for a verdict, have considered the arrival of information

[34] In *Brady v. Maryland*, 373 U.S. 83 (1963), the U.S. Supreme Court ruled that information favorable to the accused is subject to disclosure. Recent opinions suggest this disclosure requirement is frequently unenforced in many cases (see the examples in the dissent by 9th Circuit Chief Judge Kosinski in *U.S. v. Olsen*, 2013 (dissent from order denying *en banc* review) and recent articles have started to document significant limitations being applied (see Johnson, 2015, and citations therein discussing carve-outs of the Brady rule that have developed over time)). Disclosure incentives for *P* is an interesting topic, but it is beyond the current article's focus (and would undoubtedly far exceed its

mid-process (see Franzoni, 1999, and Baker and Mezzetti, 2001). Acquiring new information could also be a function of *P*'s effort. Thus, in both caveats, effort might reduce the likelihood of an *ng*-outcome (thereby yielding a reduction in the compensation paid to defendants).

5 Summary of Results

It is a reality of social life that those caught up in the criminal process, even if simply arrested (and not convicted), can be subject to informal sanctions from members of society with whom they will interact (or transact) later. Landlords have many choices of potential tenants, firms have many choices of workers to hire, colleges have many applicants to choose among for admission, and so forth. Why take a risk on someone who has run afoul of the law, when there are so many others who have not (of course, possibly by luck)? The recent recognition[35] of the cost of the imposition of informal sanctions does not really address how to rectify this social loss. This is not a simple problem, as there are also good reasons for landlords, firms, colleges, and others to avoid those in the population who may not be trustworthy, as liability may attach if the tenant/worker/student in question does commit a crime which leads to harm.

Juries, while imperfect, can provide more information than the decision to convict or acquit a defendant. Scotland has used a three-outcome verdict for almost three centuries, and as we show in our previous paper, the subdivision of acquittal into finer categories yields information that can be used by outside observers to modify their assessments of defendant guilt or innocence in a manner that results in reduced classification error. This is why truly innocent defendants are better off (and truly guilty defendants are worse off) under such a scheme.

In this paper we show that simply providing defendants with the choice of trial under either a standard verdict or Scottish verdict did not provide a signal itself; instead, in equilibrium,

---

allowed page length!).

[35] See Fields and Emshwiller, 2014, for a discussion of the lifetime employment consequences of arrest records.

all defendants would opt for the three-outcome regime. This means that the entire jury system would need to convert to the three-outcome regime, which has informational advantages but might be unconstitutional and has definitely met resistance in the U.S.

We propose instead that when a crime is specified with a given penalty (fine or imprisonment) the legislature (or other relevant state authority) could also specify state-provided compensation that the jury could award if it felt that not only should the defendant be acquitted, but that he had (effectively) been wronged. Note that this is not an assertion that the prosecution was wrongful, simply that the result of the adversarial process made it clear to the jury that the defendant should not be left with the costs of defense and the informal sanctions that come from insufficient separation from possible defendants for whom there was more (but simply not enough) evidentiary support of their possible guilt. Being able to reduce (though probably not eliminate) unwarranted informal sanctions is a social gain.

We also observed that such a selective compensation scheme potentially comes with costs other than the payment of compensation (which, from a social perspective, need not itself be a cost as it may reduce the social loss from lost opportunities to match individuals with homes, jobs, etc.). To the degree that prosecutors will be penalized by the electorate based on the compensation bill they accumulate, this will result in an increase in the relative mix of truly guilty defendants (who are less likely to be in the "not guilty" set) who choose trial, making total trial costs rise. That is, the potential improvement in the accountability of prosecutors comes at a cost (generated by increased trials plus compensation costs). This will also mean that outside observers will update their Bayesian belief that those defendants going to trial are likely to be guilty (whether acquitted or convicted), thereby attenuating the ameliorating effect of selective compensation on the imposition of informal sanctions.

References

Baker, S., and C. Mezzetti (2001), "Prosecutorial Resources, Plea Bargaining, and the Decision to Go to Trial," *Journal of Law, Economics, and Organization*, 17(1), 149-167.

Barbato, J. M.(2005), "Scotland's Bastard Verdict: Intermediacy and the Unique Three-Verdict System," *Indiana International & Comparative Law Review*, 15(3), 543-581.

Bjerk, D. (2007), "Guilt Shall not Escape of Innocence Suffer: The Limits of Plea Bargaining When Defendant Guilt is Uncertain," *American Law and Economics Review*, 9(2), 305-329.

Bray, S. (2005), "Not Proven: Introducing a Third Verdict," *The University of Chicago Law Review*, 72(4),1299-1329.

Cho, I.-K., and D. L. Kreps (1987), "Signaling Games and Stable Equilibria," *Quarterly Journal of Economics*, 102 (2), 179-221.

Daughety, A. F., and J. F. Reinganum (2014), "Informal Sanctions on Prosecutors and Defendants and the Disposition of Criminal Cases," http://www.vanderbilt.edu/econ/faculty/Daughety/DR-InformalSanctionsandCaseDispositions-Revised052015.pdf, retrieved July 20, 2015.

Duff, P. (1999), "The Scottish Criminal Jury: A Very Peculiar Institution," *Law and Contemporary Problems*, 62(2), 173-201.

Fields, G., and J. R. Emshwiller (2014), "As Arrest Records Rise, Americans Find Consequences Can Last a Lifetime," *Wall Street Journal*, August 18, 2014: http://www.wsj.com/articles /as-arrest-records-rise-americans-find-consequences-can-last-a-lifetime-1408415402, retrieved April 4, 2015.

Franzoni, L. A. (1999), "Negotiated Enforcement and Credible Deterrence," *The Economic Journal*, 109(458), 509-535.

Grossman, G. M., and M. L. Katz (1983), "Plea Bargaining and Social Welfare, *The American Economic Review*, 73(4), 749-757.

Johnson, T. (2015), "What You Should Have Known Can Hurt You: Knowledge, Access, and Brady in the Balance," *Georgetown Journal of Legal Ethics*, 28(1), 1 - 38.

Landes, W.M. (1971), "An Economic Analysis of the Courts," *Journal of Law and Economics*, 14(1), 61-108.

Leipold, A. D. (2000), "The Problem of the Innocent, Acquitted Defendant," *Northwestern University Law Review* 94(4), 1297-1356.

Nalebuff, B. (1987), "Credible Pretrial Negotiation, *The RAND Journal of Economics*, 18(2), 198-210.

Pinski,, M. I., “When Juries Need a 3rd Choice: Not Proven,” *Orlando Sentinal*, August 20, 1995, http://articles.orlandosentinel.com/1995-08-20/news/9508180787_1_not-proven-verdict-proven-verdict-innocent (retrieved April 4, 2015).

Reinganum, J. F. (1988), “Plea Bargaining and Prosecutorial Discretion,” *The American Economic Review*, 78(4), 713-728.

Appendix

Construction of Outside Observer's Posterior Beliefs as to D's Guilt

Let $\rho_G^{D\Theta}$ and $\rho_I^{D\Theta}$ denote Θ's conjectures about the probability that the G-type and I-type, respectively, reject the plea offer. Technically, Θ has a conjecture about S_b as well as about D's strategies, but it is not needed for the beliefs and we suppress this to avoid further clutter. Formally, the mathematical descriptions of Θ's beliefs given below presume that the strategy profile is fully-mixed, so that all nodes in the game are visited with positive probability, allowing us to use Bayes' Rule to provide the indicated formula. As we will see, $\rho^P = 1$ is part of the equilibrium of the game, so that the outcome d is an out-of-equilibrium outcome, and the value for $\mu(G \mid d)$ will need to be otherwise specified, since d will not be visited in equilibrium. Moreover, P's strategy, ρ^P, does not affect the beliefs because it (or $1 - \rho^P$) multiplies each relevant numerator and denominator and thereby drops out of the analysis.

(A.1a) $\mu(G \mid a) = \rho_G^{D\Theta}(1 - \lambda)F_G/[\rho_G^{D\Theta}(1 - \lambda)F_G + \rho_I^{D\Theta}\lambda F_I]$;

(A.1b) $\mu(G \mid b) = (1 - \rho_G^{D\Theta})(1 - \lambda)/[(1 - \rho_G^{D\Theta})(1 - \lambda) + (1 - \rho_I^{D\Theta})\lambda]$;

(A.1c) $\mu(G \mid c) = \rho_G^{D\Theta}(1 - \lambda)(1 - F_G)/[\rho_G^{D\Theta}(1 - \lambda)(1 - F_G) + \rho_I^{D\Theta}\lambda(1 - F_I)]$;

and

(A.1d) $\mu(G \mid d) = \rho_G^{D\Theta}(1 - \lambda)/[\rho_G^{D\Theta}(1 - \lambda) + \rho_I^{D\Theta}\lambda]$.

The Prosecutor's Posterior Beliefs as to D's Guilt

For arbitrary probabilities that a D of type $t = G, I$ rejects a plea offer made by P, P uses Bayes' theorem and the strategies to provide an updated assessment of D being a G upon observing the choice R:

$$v(G \mid R) = \rho_G^D(1 - \lambda)/[\rho_G^D(1 - \lambda) + \rho_I^D\lambda].$$

Since, in equilibrium, an I-type always rejects, $\rho_I^D = 1$, which simplifies the above posterior. Clearly, $v(I \mid R) = 1 - v(G \mid R)$.

Maintained Restrictions

We maintain the following reasonable restrictions on the parameters.

MR0: *P strictly prefers to go to trial against a D she believes to be a G-type in comparison with one she believes to be an I-type. Formally, this reduces to assuming that (given* $\rho_G^{D\Theta}$, $\rho_I^{D\Theta}$, *and the corresponding associated beliefs for* Θ*):* $S_c - r_I^P\mu(I \mid c) + r_G^P\mu(G \mid a) > 0$.

MR1: *If P and Θ know (or commonly believe) that D is of type I, P strictly prefers to drop the case. Formally, this reduces to:* $(S_c - r_I^P)(1 - F_I) - k^P < 0$.

MR2: *If P and Θ know (or commonly believe) that the fraction of type G among those that reject the plea offer is the same as the prior, then P strictly prefers trial to dropping the case. Formally, this reduces to:* $(1 - \lambda)[(S_c + r_G^P)(1 - F_G) - k^P] + \lambda[(S_c - r_I^P)(1 - F_I) - k^P] > 0$.

Construction of Outside Observer's Posterior Beliefs as to D's Guilt for the Scottish Verdict

Let $\rho_G^{D\Theta}$ and $\rho_I^{D\Theta}$ denote Θ's conjectures about the probability that the G-type and I-type, respectively, reject the plea offer. Then:

(A.2a) $\mu(G \mid g) = \rho_G^{D\Theta}(1 - \lambda)(1 - F_G(\gamma_g))/[\rho_G^{D\Theta}(1 - \lambda)(1 - F_G(\gamma_g)) + \rho_I^{D\Theta}\,\lambda(1 - F_I(\gamma_g))]$;

(A.2b) $\mu(G \mid np) = \rho_G^{D\Theta}(1 - \lambda)\Delta_G/[\rho_G^{D\Theta}(1 - \lambda)\Delta_G + \rho_I^{D\Theta}\lambda\Delta_I]$;

(A.2c) $\mu(G \mid ng) = \rho_G^{D\Theta}(1 - \lambda)F_G(\gamma_{ng})/[\rho_G^{D\Theta}(1 - \lambda)F_G(\gamma_{ng}) + \rho_I^{D\Theta}\,\lambda F_I(\gamma_{ng})]$;

(A.2d) $\mu(G \mid b) = (1 - \rho_G^{D\Theta})(1 - \lambda)/[(1 - \rho_G^{D\Theta})(1 - \lambda) + (1 - \rho_I^{D\Theta})\lambda]$;

and

(A.2e) $\mu(G \mid d) = \rho_G^{D\Theta}(1 - \lambda)/[\rho_G^{D\Theta}(1 - \lambda) + \rho_I^{D\Theta}\lambda]$.