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Legal Change and the Social Value of Lawsuits

Thomas J. Miceli
University of Connecticut

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University of Connecticut

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341 Mansfield Road, Unit 1063
Storrs, CT 06269–1063
Phone: (860) 486–3022
Fax: (860) 486–4463
http://www.econ.uconn.edu/

Abstract

This paper integrates the literatures on the social value of lawsuits, the evolution of the law, and judicial preferences to evaluate the hypothesis that the law evolves toward efficiency. The setting is a simple accident model with costly litigation where the efficient law minimizes the sum of accident plus litigation costs. In the steady state equilibrium, the distribution of legal rules is not necessarily efficient but instead depends on a combination of selective litigation, judicial bias, and precedent.

Journal of Economic Literature Classification: K40, K41

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Legal Change and the Social Value of Lawsuits

1. Introduction

This paper combines three distinct literatures to examine the efficiency of the legal process for resolving disputes. The first literature concerns the social versus private value of lawsuits, an issue first raised by Shavell (1982).[1] The question here is whether plaintiffs have the correct (i.e., socially efficient) incentives to use the legal system to seek compensation for their accident losses. The answer turns on the cost of litigation relative to its ability to induce efficient accident prevention. In particular, strict liability is beneficial because it induces injurers to take care, thereby reducing the accident rate, but it can only perform this function if victims are willing to file costly lawsuits. Thus, if the cost of litigation outweighs the savings from accident prevention, no liability will be the preferred rule.[2]

An important social purpose of lawsuits not addressed in this literature is their lawmaking function. Trials perform this function by periodically allowing judges to evaluate existing legal rules (precedents) and possibly replace them with more efficient rules. Whether or not this "favorable selection" occurs, however, depends on what types of case go to trial, and what biases, if any, judges have.

A large literature has arisen to answer these questions. It began with Posner's early conjecture that common law judges actively promote efficiency. The basis of his argument is that, because common law judges "cannot do much…to alter the slices of the pie that various groups in society receive, they might as well concentrate on increasing its

[1] Also see Menell (1983), Kaplow (1986), Rose-Ackerman and Geistfeld (1987), and Shavell (1997, 1999).
[2] Another possible advantage of no liability, besides saving on litigation costs, is to provide victims with an incentive to take care (Miceli, 2008).

size" (Posner, 2003, p. 252). Dissatisfied with this argument, however, Rubin (1977) and Priest (1977) identified market-like (invisible hand) forces that tend to propel the law toward efficiency based on the self-interested behavior of litigants rather than the conscious efforts of judges.[3] Specifically, they argued that because inefficient rules result in higher costs for litigants, they are more likely to end up at trial where they can be adjudicated and, provided that judges are not biased *against* efficiency, eventually replaced by more efficient rules. This important insight is referred to as the "selective litigation hypothesis." Rubin and Priest, however, did not embed their analysis in an equilibrium model of legal change, and so stopped short of providing a complete characterization of the equilibrium distribution of legal rules. The model of legal change in this paper remedies this deficiency by deriving the steady state distribution of legal rules in a simple accident model.

The final component of the analysis involves explicitly re-introducing judges into the legal process. Whereas a literature on judicial decision making has developed,[4] it has not succeeded in drawing a firm link between the motivation of judges and the nature of legal change. A recent effort to bridge that gap, however, is offered in the companion papers by Gennaioli and Shleifer (2007a,b). In their models, judges are potentially biased for one side or the other in a legal dispute, and so, to the extent that they have the power (or the inclination) to depart from precedent,[5] they can affect the direction of legal change. These models represent an important contribution to the literature on the

[3] The relegation of judges to the background was partly due to a lack of good models explaining judicial behavior, but also partly a conscious effort to identify a mechanism for legal change apart from judicial decision making.
[4] See, for example, Higgins and Rubin (1980), Cohen (1991), Miceli and Cosgel (1994), and Posner (1995, Chapter 3).
[5] The authors distinguish between "overruling" precedent, and "distinguishing" a new law from precedent. The difference is not important for present purposes.

evolution of the law because they are the first to incorporate judicial preferences in a meaningful way into the analysis of legal change. The current paper borrows heavily from the characterization of potential judicial bias by Gennaioli and Shleifer, but it goes beyond their models by combining judicial bias and precedent with the Rubin-Priest selective litigation effect to characterize the equilibrium distribution of legal rules.

The main conclusion of the current paper is that the law will not generally evolve completely toward any one rule, but will reach a steady state equilibrium under which the distribution of rules depends on both the nature of judicial bias and the selective litigation effect.[6] The argument is developed as follows. Section 2 sets up the simple unilateral care accident model on which the analysis is based. Section 3 derives the steady state equilibrium of the model, and Section 4 examines its efficiency properties. Section 5 then extends the analysis to the case where injurer care affects the victim's damages as well as the probability of an accident, and Section 6 considers the bilateral care case. Finally Section 7 concludes.

2. The Model

To provide and explicit basis for the lawmaking process, we consider a unilateral care accident model in which potential injurers and victims interact a fixed number of times (or with a fixed probability) over a given time interval, where each interaction is a "potential accident."[7] (Time is thus measured by the interaction rate.) In anticipation of each interaction, injurers (defendants) choose a level of care, x, where x determines the probability of an accident, $p(x)$, per interaction (i.e., per unit of time), and $p'<0$, $p''>0$. In

[6] This point was first made by Miceli (2009).
[7] Section 6 extends the analysis to bilateral care accidents.

the event of an accident, the victim (plaintiff) suffers a random loss, L, which we assume is uniformly distributed on $[0, \bar{L}]$ with expected value $\bar{L}/2$.[8] The plaintiff observes her loss, but the defendant does not, though he knows the distribution of losses. If an accident occurs, the plaintiff decides whether or not to file suit. If she files, the plaintiff and defendant engage in pretrial bargaining which results in a settlement or a trial. We examine the pre-trial period in reverse sequence of time, beginning with the settlement decision.

2.1. The Settlement Decision

Given the defendant's inability to observe the plaintiff's specific losses, he makes a take-it-or-leave-it offer S, which the plaintiff accepts or rejects.[9] If she accepts, the case ends. If she rejects, the case goes to trial, where the plaintiff expects to win with probability w (to be specified below). Thus, the expected value of trial to a plaintiff who has suffered a loss of L is

$$V_p(w) = wL - C_p, \tag{1}$$

where C_p is the plaintiff's cost of a trial.

Given (1), a plaintiff of type L will accept the defendant's settlement offer of S if and only if $S \geq V_p(w)$, or if and only if

$$L \leq \frac{S + C_p}{w} \equiv \hat{L}(w), \tag{2}$$

where the critical value, $\hat{L}(w)$, is decreasing in w. Thus, for any given settlement offer, the higher is the plaintiff's probability of winning at trial, the less likely is a settlement.

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[8] In Section 5 we extend the analysis to allow the defendant's care also to affect the magnitude of plaintiff losses.

[9] The settlement model employed here is originally due to Bebchuk (1984).

Consider next the determination of the defendant's optimal settlement offer, S^*. Recall that the defendant is assumed not to be able to observe the particular loss of the plaintiff prior to trial, but he knows w. Thus, he chooses S to minimize his expected costs. Specifically, the defendant's problem is to

$$\min_{S} F(\hat{L})S + \int_{\hat{L}(w)}^{\bar{L}} (wL + C_d)\,dF(L), \tag{3}$$

where C_d is the defendant's trial cost. The first order condition defining S^* is given by

$$F(\hat{L}) = f(\hat{L})(C_p + C_d)/w. \tag{4}$$

For the case where F is uniform, this condition yields

$$S^* = C_d. \tag{5}$$

Thus, the optimal settlement offer is simply equal to the defendant's trial costs. Substituting this into (2) yields the equilibrium threshold for plaintiffs:

$$\hat{L}^*(w) = \frac{C_p + C_d}{w}. \tag{6}$$

It follows that the probability of a trial, given an accident, is

$$T(w) = 1 - F(\hat{L}^*(w))$$

$$= 1 - \frac{C_p + C_d}{w\bar{L}}, \tag{7}$$

where $\partial T / \partial w > 0$. Thus, a higher plaintiff win rate increases the probability of a trial, given the occurrence of an accident.

Finally, we assume that S^* exceeds the filing costs of plaintiffs (which we take to be zero). Thus, all plaintiffs, whether or not they expect to go to trial, will file suit in the event of an accident.[10]

2.2. The Accident and Trial Rates

As noted above, the probability of an accident for each injurer-victim interaction is determined by the defendant's choice of care. Define $A^*(w)$ to be the minimized costs of the defendant during the settlement-trial stage. That is, $A^*(w)$ is the minimized value of (3). Thus, prior to each interaction, the defendant chooses x to solve

$$\min_x x + p(x)A^*(w). \tag{8}$$

The resulting first order condition is

$$1 + p'A^*(w) = 0, \tag{9}$$

which defines the optimal care level, $x^*(w)$. Differentiating (3), and applying the Envelope Theorem, we find that

$$\frac{\partial A^*}{\partial w} = -f(C_p + C_d)\left(\frac{\partial \hat{L}^*}{\partial w}\right) + \int_{\hat{L}^*}^{\bar{L}} L\,dF(L) > 0, \tag{10}$$

which implies that $\partial x^*/\partial w > 0$. A higher plaintiff win rate thus increases the defendant's expected costs from litigation, and hence increases his incentive to take care. Finally, the accident rate, $p^*(w) \equiv p(x^*(w))$, varies with w as follows:

$$\frac{\partial p^*}{\partial w} = p'\left(\frac{\partial x^*}{\partial w}\right) < 0. \tag{11}$$

An increase in w thus reduces the accident rate by enhancing the defendant's incentive to take care.

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[10] As a result, some cases whose expected value at trial is negative will succeed in obtaining a settlement (Bebchuk, 1988).

The expected number of trials per injurer-victim interaction (i.e., per unit of time) can now be written as the product of the accident and trial rates:

$$N(w) = p^*(w)T(w). \tag{12}$$

Differentiating, we obtain

$$\frac{\partial N}{\partial w} = T\frac{\partial p^*}{\partial w} + p^*\frac{\partial T}{\partial w} \ , \tag{13}$$

which is ambiguous in sign. Whereas a higher plaintiff win rate reduces the accident rate by enhancing incentives, it increases the trial rate by making trials more valuable to plaintiffs.

2.3. The Evolution of Legal Rules

In order to investigate the evolution of legal rules through the litigation process, and specifically, the proposition that the law evolves toward efficiency, we first need to be explicit about the rules for allocating liability in our simple accident model. Because care is unilateral, it is sufficient to consider two rules: strict liability (SL) and no liability (NL). Strict liability will induce more care by injurers, which lowers the accident rate, but it also leads to lawsuits, which are costly. Thus, depending on which effect dominates in terms of overall social costs, either rule may be efficient. At this point, however, we are only interested in what determines the distribution of the two rules.

Suppose that, at any point in time (i.e., prior to any injurer-victim interaction), both rules, SL and NL, exist in the population of legal rules in some arbitrary proportion. For example, consider a multi-jurisdictional legal system in which rules can vary by jurisdiction. In this setting, we ask how the process of litigation causes the distribution of rules to evolve. To that end, let θ be the proportion of SL and $1–\theta$ the proportion of NL. Further, suppose that each potential accident involves one of these rules, and that both the injurer and victim know with certainty which type of rule applies to their particular interaction. (That is, they know the prevailing rule in their jurisdiction.)

The possibility of legal evolution requires that laws change, but this can only happen at trial. That is, cases that settle can have no effect on the state of the law. When a case goes to trial, the judge can either uphold the prevailing rule, which means finding for the plaintiff if the rule is SL and finding for the defendant if the rule is NL, or he can overrule the prevailing rule. Obviously, since there are only two rules, overruling means replacing SL with NL and vice versa. (Thus, we do not allow judges to fashion new or hybrid rules like negligence.) We suppose that two factors affect a judge's decision in this regard: *precedent* and *judicial bias*.

A judge who follows precedent simply enforces the prevailing rule. Since strict adherence to precedent permits no legal change, we assume that precedent has some strength but is not completely binding. Specifically, let β be the probability that a judge follows precedent, and $1-\beta$ the probability that he overrules precedent. The magnitude of β (which is independent of the particular rule in place) thus represents an index of the strength of precedent.[11]

As for judicial bias, we suppose that there are two types of judges: pro-plaintiff (PP), and pro-defendant (PD) (Gennaioli and Shleifer, 2007a,b; Miceli, 2009). PP judges favor SL and will always apply it when it is the prevailing precedent. In addition, they will apply it with probability $1-\beta$ when it is not the precedent. Conversely, PD judges favor NL, so they will always apply it when it is the precedent, and will apply it with probability $1-\beta$ when it is not the precedent. Let δ represent the fraction of PD judges

[11] It could also represent something about the distribution of judges regarding their respect for precedent (e.g., the proportion of activist judges versus strict constructionists). See Miceli and Cosgel (1994) on judicial preferences and precedent.

(i.e., those who favor NL), while the remaining fraction, $1–\delta$, are PP (those who favor SL).

We can now calculate the win probabilities, w_j, for plaintiffs under each of the two rules ($j=SL, NL$). This involves calculating the probability that the court will apply SL, the pro-plaintiff rule. First, if SL is the prevailing rule, it will automatically be applied by all PP judges and by those PD judges who follow precedent. Thus, we have

$$w_{SL} = (1-\delta) + \delta\beta. \tag{14}$$

In contrast, if NL is the prevailing rule, all PD judges will apply it, as well as those PP judges who deviate from precedent. Thus,

$$w_{NL} = (1-\delta)(1-\beta). \tag{15}$$

Comparing (14) and (15), we find that $w_{SL}>w_{NL}$ if and only if $\beta>0$, which we assume is true. Thus, as long as precedent has some force, SL results in a higher win probability for plaintiffs, reflecting its pro-plaintiff orientation.

Returning to the above settlement model, we can now state that the probability of a trial is higher under SL than under NL; that is, $T_{SL}>T_{NL}$. This follows from the fact that $\partial T/\partial w>0$. Intuitively, the higher win probability for plaintiffs under SL makes trials more valuable, all else equal, thereby increasing the probability that any given case will go to trial. Likewise, the accident model implies that defendant care is higher under SL ($x^*_{SL}>x^*_{NL}$), and correspondingly, that the probability of an accident is lower under SL ($p_{SL}^*<p_{NL}^*$). These conclusions follow from the fact that $\partial A^*/\partial w>0$. Intuitively, a higher win rate for plaintiffs increases defendants' expected cost, thus inducing them to invest in greater care, which in turn results in fewer accidents.

Given the presence of two legal rules in the population, we need to rewrite the expected number of trials per unit time in (12) as follows:

$$N(\theta) = \theta p_{SL}{*}(w)T_{SL}(w) + (1-\theta)p_{NL}{*}(w)T_{NL}(w). \tag{16}$$

Differentiating this expression with respect to θ yields

$$\frac{\partial N}{\partial \theta} = p{*}_{SL}\, T_{SL} - p{*}_{NL}\, T_{NL}\,, \tag{17}$$

which is ambiguous in sign, given that $p_{SL}{*}<p_{NL}{*}$ and $T_{SL}>T_{NL}$. As noted above, an increase in the proportion of SL lowers the accident rate by increasing injurer care but raises the trial rate by increasing the value of trial to plaintiffs. Note that condition (17) is a formal version of the selective litigation effect in that it determines the relative frequency with which the two legal rules come before the court to be adjudicated. This effect will play an important role in determining the evolution of the law because, as noted, only those laws that make it to trial can be changed.

3. The Determination of Equilibrium

As time unfolds, the process of litigation will cause the distribution of legal rules to evolve as cases come before the court to be adjudicated. As noted above, judges have biases and are imperfectly bound by precedent, so they will occasionally overturn laws based on their preferences. In this section, we investigate this evolution and derive the resulting steady state equilibrium distribution of the two rules.

To proceed, suppose that there is some initial fraction of SL rules, θ_0, and suppose that litigation occurs over a fixed period of time as described in the above model. We can then add up the number (proportion) of SL rules at the end of that period and see how it compares to θ_0.[12] Given our characterization of judicial behavior, SL can emerge from the litigation process in four ways. First, if no accidents occur when SL is the prevailing rule, it will not be litigated and thus will remain in place. This occurs with probability $\theta_0(1–p_{SL}*)$. Second, if an accident does occur, the case may settle before reaching court. In this case, which occurs with probability $\theta_0 p_{SL}*(1–T_{SL})$, the rule will also remain in place. Third, if an accident occurs under SL and the case goes to trial, the judge may uphold the rule. This will happen either if the judge is pro-plaintiff (PP), or if the judge is pro-defendant (PD) but chooses to follow precedent. The combined probability of these two outcomes is $\theta_0 p_{SL}*T_{SL}[(1–\delta) + \delta\beta]$. Finally, SL can emerge from an accident involving NL if the case makes it to court and the judge overturns precedent (an event that will only occur if the judge is PP). The probability of this outcome is $(1–\theta_0)p_{NL}*T_{NL}(1–\delta)(1–\beta)$. Summing these probabilities yields the proportion of efficient rules at the start of the next cycle of litigation, denoted θ_1:

$$\theta_1 = \theta_0(1–p_{SL}*) + \theta_0 p_{SL}*(1–T_S) + \theta_0 p_{SL}*T_{SL}[(1–\delta) + \delta\beta] + (1–\theta_0)p_{NL}*T_{NL}(1–\delta)(1–\beta). \tag{18}$$

To derive the steady state equilibrium, set $\theta_1=\theta_0=\theta$ in (18) and solve for θ to obtain

$$\theta = \frac{p_{NL} * T_{NL}(1-\delta)}{p_{NL} * T_{NL}(1-\delta) + p_{SL} * T_{SL}\delta}. \tag{19}$$

We will refer to (19) as the "selection ratio." Note that it depends on the relative number of trials that arise under each of the two rules, and the distribution of judicial bias.

[12] This procedure follows Miceli (2009).

Interestingly, it does *not* depend on the strength of precedent, β. Thus, the strength of precedent only affects the rate of legal change, not its direction.[13]

Several special cases emerge from (19), depending on the distribution of judicial bias. First, if δ=0, then θ=1. Thus, if all judges are PP, then the law will eventually fully converge to SL. Conversely, if δ=1 (all judges are PD), then θ=0; that is, the law will fully converge to NL. Finally, if δ=½, (19) becomes

$$\theta = \frac{p_{NL} * T_{NL}}{p_{NL} * T_{NL} + p_{SL} * T_{SL}}. \tag{20}$$

In this case, judges are on average "unbiased." Thus, the law evolves according the "pure" selection effect. This is the case studied by Rubin and Priest. Note that here, the law will not generally evolve fully toward either rule, but instead will settle at a steady state equilibrium in which *the proportion of a given rule equals the conditional probability that a case going to trial involves the other rule*. Intuitively, the more often a rule comes to trial, the more chances it has to be overturned by a judge and replaced by the other rule. Conversely, if a rule rarely comes to trial, it will have less chance to be overturned.

We can now see the importance of the above assumption regarding the sign of (17). Suppose, for example, that it is negative, implying that $p_{SL}*T_{SL}<p_{NL}*T_{NL}$. It follows from (20) that θ>½; that is, the proportion of SL rules exceeds the proportion of NL rules in the steady state. In this case, the selection effect favors SL. The reverse would be true if we assumed that (17) is positive. That is, selection would favor NL and θ<½. Of course, this pure selection effect can be either offset or augmented by judicial bias

[13] Miceli (2009) first derived this result in a simpler model.

according to the more general condition in (19). In any case, however, the steady state will generally include some of both rules.

4. Welfare Analysis

To this point, our discussion of the distribution of legal rules has not explicitly addressed the question of efficiency; in particular, whether the more efficient rule will come to dominate the population of rules. Note first that if judges are "Posnerian" in the sense of seeking efficient rules, then the above model is consistent with the law converging fully to efficiency since the efficiency bias of judges will eventually dominate the selection effect (provided, of course, that the inefficient law is occasionally litigated). The more interesting question, however, is whether the law will converge to efficiency without the help of judges, as conjectured by Rubin and Priest.

Regarding Rubin's model, convergence requires both plaintiffs and defendants to have an interest in precedent in the sense that they are repeat players and hence will take account of the present value of all future accident costs when making their litigation decisions. Given the set up of his model, if the parties are one-time players, the law would never change because, given symmetric beliefs about the outcome of trial, all cases would settle. Priest overcomes this difficulty by positing differing perceptions about the outcome of trial by plaintiffs and defendants (based on the Landes (1971) model), thus allowing some trials even when litigants are one-timers. Given this, the key mechanism in Priest's model is that inefficient laws impose higher damages on victims, which translate into higher stakes for disputes arising under those laws. And since Landes's model predicts that cases with higher stakes are more likely to go to trial, inefficient laws will come before judges more often than efficient laws, resulting in a favorable selection as described above.

The current model resembles Priest's in that litigants are one-timers, though trials occur here as a result of asymmetric information rather than differing perceptions. As discussed above, Priest's selection effect is reflected by (17), which determines the frequency of trial under the two rules. Priest's conjecture that the inefficient rule results in more trials is captured here by the p^* term, which describes the frequency of accidents. If, for example, SL is the efficient rule because it induces injurer care, p^* will be higher under NL, the inefficient rule, resulting in more disputes. Offsetting this, however, is that the trial rate is lower under NL because cases are less valuable to plaintiffs (given $w_{NL}<w_{SL}$), making them more willing to settle as compared to SL. Thus, the overall selection effect, which combines the frequency of accidents (disputes) and the trial rate, will not necessarily involve more cases reaching trial under NL, as is required for favorable selection to occur (assuming SL is the more efficient rule).

To make this argument more rigorous, note that efficiency in the current model consists of minimizing overall accident costs, which include the cost of injurer care, the victim's damages, and litigation costs. Thus, social costs under rule j ($j=SL,NL$) are given by

$$SC_j = x_j^* + p_j^*[E(L) + T_j(C_p+C_d)]. \tag{21}$$

Strict liability is therefore more efficient than no liability if and only if $SC_{SL}<SC_{NL}$, or if and only if

$$x_{SL}^* - x_{NL}^* < (p_{NL}^* - p_{SL}^*)E(L) + (p_{NL}^*T_{NL} - p_{SL}^*T_{SL})(C_p+C_d). \tag{22}$$

We know from the above accident model that $x_{SL}^* < x_{NL}^*$ and $p_{NL}^* > p_{SL}^*$, or that SL results in greater injurer care and hence a lower accident rate. Thus, the left-hand side and the first term on the right-hand side of (22) are both positive. Together, the relationship between these two terms constitutes the standard Hand test for determining whether care is efficient. Based on these terms alone, we would conclude that SL is the more efficient rule due to its superior incentive effects.[14] Note that Priest's favorable selection effect is reflected in the marginal benefit term (the first term on the right-hand side) by the fact that $p_{NL}^* - p_{SL}^* > 0$. That is, the larger is the marginal benefit of care under SL, the greater will be the differential in disputes arising under NL as compared to SL, thus tending to increase the proportion of SL in the population.

Now consider the final term on the right-hand side of (22), which reflects the impact of litigation costs on the efficiency of the law. Note that its sign is determined by the selection effect in (17), which we have seen may be positive or negative, depending on which rule results in more trials. It is positive if NL results in more trials, thus reinforcing the efficiency of SL. In contrast, it is negative if SL results in more trials, thus counteracting, and possibly overwhelming the efficiency of SL. This reflects the insight of the literature on the social value of lawsuits—namely, that when litigation is costly, it may or may not be socially desirable to use the liability system to induce injurers to take care.[15]

In terms of the evolution of law, the litigation cost term in (22) reinforces the link between the efficiency of the law and the equilibrium distribution of rules as discussed above. For example, if this term is positive, NL results in more trials, which, in the

[14] Since injurers take less than efficient care under both SL and NL, the rule that induces more care (SL) is closer to the efficient outcome.
[15] See the references in footnote 1 above.

absence of judicial bias, implies that SL will be the dominant rule in the steady state equilibrium (i.e., θ>½ in (22)). Conversely, if this term is negative, SL results in more trials, which implies that NL will be the dominant rule (i.e., θ<½). The selection effect therefore works in the right direction for efficiency—that is, it works in the direction of favoring the efficient law. In other words, the rule that entails higher litigation cost is less likely to be efficient, while at the same time, the higher litigation rate for that rule will tend to reduce its frequency in the population. Further, the greater the cost differential between the two rules, the less prevalent will be the costlier rule in the steady state equilibrium.

Finally, it should be recalled that, despite the foregoing argument, selection generally will not be able to completely eliminate the less efficient rule in the steady state unless the judiciary is fully biased toward the efficient rule. Moreover, a judiciary that is biased against the efficient rule can drive the law away from efficiency in spite of a favorable selection effect (Gennaioli and Shleifer, 2007a,b).

5. Injurer Care also Reduces Expected Damages

This section extends the model to allow injurer care to affect the victim's expected damages as well as the probability of an accident. Specifically, suppose that the victim's realized damages in the event of an accident are now given by $a(x)L$, where $a(x)$ is a decreasing function of x (i.e., a'<0), while L continues to be a random variable. All other aspects of the model remain the same.

Consider first the settlement decision, given that an accident has occurred. Since the plaintiff's realized damages are $a(x)L$, her expected value of trial is now

V_p=$wa(x)L$–C_p. The plaintiff will accept the defendant's settlement offer of S if and only if $S \geq V_p$, or

$$L \leq \frac{S+C_p}{wa(x)} \equiv \hat{L}(w,x)\,. \tag{23}$$

The defendant's cost minimization problem in this case is to minimize

$$F(\hat{L})S + \int_{\hat{L}}^{\bar{L}} (wa(x)L + C_d)dF(L)\,, \tag{24}$$

which, for the case of a uniform distribution, again yields $S^*=C_d$. It follows that

$$\hat{L}^*(w,x) = \frac{C_p + C_d}{wa(x)} \tag{25}$$

and

$$T(w,x) = 1 - F(\hat{L}^*(w,x)) = 1 - \frac{C_p + C_d}{wa(x)}\,. \tag{26}$$

Note that $T(w,x)$ is increasing in w and decreasing in x (given a'<0).

Turning to the injurer's care choice, we define $A^*(w,x)$ to be the minimized value of (24). Note that this cost is now a decreasing function of x. Specifically,

$$\frac{\partial A^*}{\partial x} = a' \int_{\hat{L}^*}^{\bar{L}} wLdF(L) - (C_p + C_d)\, f(\hat{L}^*)\left(\frac{\partial \hat{L}^*}{\partial x}\right) < 0\,, \tag{27}$$

where $\partial \hat{L}^* / \partial x > 0$ from (25). The first order condition for cost minimization by the defendant is therefore

$$1 + p'A^* + p(\partial A^*/\partial x) = 0, \tag{28}$$

which defines $x^*(w)$. Differentiating (27), we find that

$$\frac{\partial^2 A^*}{\partial x \partial w} = a' \int_{\hat{L}^*}^{\bar{L}} LdF(L) < 0\,, \tag{29}$$

from which it follows that $\partial x^*/\partial w>0$ (assuming that the second order condition for x^* holds). Thus, as before, an increase in the plaintiff's win rate increases the injurer's care. This further implies that $\partial p^*/\partial w<0$, or the accident rate is decreasing in the plaintiff's win rate, also as before. However, the effect of w on the probability of a trial in the event of an accident is now ambiguous. Specifically,

$$\frac{dT}{dw} = \frac{\partial T}{\partial w} + \frac{\partial T}{\partial x^*}\frac{\partial x^*}{\partial w}, \qquad (30)$$

where again $\partial T/\partial w>0$, but the second term is negative, implying that rules involving a lower level of injurer care will work in the direction of increasing the trial rate. This reflects the mechanism identified by Priest in the context of the current model. Note that this effect will tend to increase the proportion of SL in the steady state equilibrium, as defined by (19) (for biased judges) and (20) (for unbiased judges). In this way, it mitigates the pro-trial bias inherent in the SL rule.

Finally note that social costs in the current version of the model are given by

$$SC_j = x_j^* + p_j^*[a_j^*E(L) + T_j(C_p+C_d)], \qquad (31)$$

where $a_j^*\equiv a(x_j^*)$. The condition for SL to be more efficient than NL is therefore

$$x_{SL}^* - x_{NL}^* < (p_{NL}^*\, a_{NL}^* - p_{SL}^*a_{SL}^*)E(L) + (p_{NL}^*T_{NL} - p_{SL}^*T_{SL})(C_p+C_d). \qquad (32)$$

Compared to (22), the right-hand side of this condition will tend to be larger, both because the impact of injurer care on expected damages increases the marginal benefit of care, and because the Priest mechanism increases the litigation cost term by raising the trial rate of NL relative to SL. Both of these effects therefore work in the direction of making SL more efficient, while at the same time leading to a higher proportion of SL in the population through the selection effect.

6. The Bilateral Care Case

This section extends the above analysis to the case of bilateral care.[16] When victims as well as injurers can take case, we write the probability of an accident as $p(x,y)$, where y is the victim's expenditure on care, and $p_x<0, p_{xx}>0$, $p_y<0$, $p_{yy}>0$, and $p_{xy}\geq 0$.[17] To simplify matters, we return to the case where care only affects the probability of an accident.

If an accident occurs, the settlement process proceeds as above. The resulting cost for the defendant in the event of an accident continues to be given by $A^*(w)$ (the minimized value of (3)), which determines the optimal care level of $x^*(w)$. (The only difference is that $p(x,y)$ replaces $p(x)$ in (8) and p_x replaces p' in (9).) The corresponding cost for the plaintiff, representing her expected uncompensated accident losses, will determine her optimal care level. We assume that when she makes her care choice, the plaintiff does not know what her actual damages will be in the event of an accident. Thus, given the above settlement model, she expects to settle for S^* if $L \leq \hat{L}^*(w)$ and go to trial otherwise. Her net expected uncompensated costs per accident are therefore[18]

$$B^*(w) = \int_0^{\hat{L}^*(w)} (L - S^*)dF(L) + \int_{\hat{L}^*(w)}^{\bar{L}} (L - wL + C_p)dF(L)$$

$$= E(L) - F(\hat{L}^*(w))S^* - \int_{\hat{L}^*(w)}^{\bar{L}} (wL - C_p)dF(L). \qquad (33)$$

Differentiating (33) and using $S^*=C_d$ yields

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[16] This is the case studied by Rubin (1977), although he focused on discrete care and assumed that it is only efficient for one or the other party to take care (the so-called "alternative care" case).

[17] The sign of the cross partial implies that injurer and victim care are (weak) substitutes, which is the usual assumption.

[18] Note that it is possible for $B^*(w)$ to be negative. If this is true, the victim will choose zero care.

$$\frac{\partial B^*}{\partial w} = -\int_{\hat{L}^*(w)}^{\bar{L}} L dF(L) < 0 . \tag{34}$$

Thus, an increase in the plaintiff's win rate reduces her expected costs.[19]

Given (33), the plaintiff's optimal care choice solves

$$\min_y y + p(x, y) B^*(w) . \tag{35}$$

Assuming an interior solution (i.e., $y^*>0$), this yields the first-order condition

$$1 + p_y B^*(w) = 0. \tag{36}$$

Together, (9) and (36) simultaneously determine the Nash equilibrium care levels, $x^*(w)$ and $y^*(w)$. The facts that $\partial A^*/\partial w>0$ and $\partial B^*/\partial w<0$ imply that $\partial x^*/\partial w>0$ and $\partial y^*/\partial w<0$.[20] Thus, a higher plaintiff win rate increases injurer care and reduces victim care.

We continue to focus on two rules, SL and NL. The plaintiff's win rate under each rule is still given by (14) and (15). Thus, $w_{SL}>w_{NL}$. Consequently, the above accident model implies $x_{SL}^*>x_{NL}^*$ but $y_{SL}^*<y_{NL}^*$. Thus, the comparison between p_{SL}^* and p_{NL}^* is now ambiguous; it depends on the relative importance of injurer and victim care in preventing accidents. However, it remains true that $T_{SL}>T_{NL}$ since, once an accident occurs, the settlement process depends only on the plaintiff's actual loss, L, and is unaffected by the parties' (sunk) care choices. The sign of (17), reflecting the direction of the selection effect, therefore remains ambiguous, though presumably it is more likely to be positive because the victim's optimal care choices will tend to raise p_{SL}^* and lower

[19] Note also that the sum of the defendant's and plaintiff's costs equal the social costs of an accident (as they must). That is, $A^*(w) + B^*(w) = SC^*(w) = E(L) + T(w)(C_p+C_d)$.

[20] In deriving these comparative statics, we assumed that the Nash equilibrium is stable. This amounts to assuming that the defendant's reaction function, $x^*(y)$, is steeper than the plaintiff's reaction function, $y^*(x)$, in (y,x) space.

p_{NL}* compared to the unilateral care case. In other words, the possibility of victim care will reduce (or eliminate) the advantage of SL over NL in terms of accident prevention.

The steady state equilibrium distribution of legal rules continues to be given by (19). The preceding argument regarding the effect of victim care on the selection effect, however, suggests that the resulting equilibrium will most likely involve a smaller proportion of strict liability rules. Intuitively, the relatively higher accident rate under strict liability, owing to the impact of victim care choices, results in a larger fraction of cases involving strict liability making it to trial compared to the unilateral care case, thereby increasing the likelihood that strict liability will be replaced by no liability (holding the nature of judicial bias fixed).

Turning to the question of efficiency, we can write social costs under rule j as

$$SC_j = x_j^* + y_j^* + p_j^*[E(L) + T_j(C_p+C_d)]. \tag{37}$$

Strict liability is therefore more efficient than no liability if and only if

$$(x_{SL}^*+y_{SL}^*) - (x_{NL}^*+y_{NL}^*) < (p_{NL}^*-p_{SL}^*)E(L) + (p_{NL}^*T_{NL} - p_{SL}^*T_{SL})(C_p+C_d), \tag{38}$$

which is the analog to (22). Unlike (22), however, it is no longer true that the left-hand side and the first term on the right-hand side are positive. This reflects the offsetting impacts of the liability rules on injurer and victim care. Thus, litigation costs aside, either liability rule may be efficient when care is bilateral. The possibility that NL is efficient in this case thus coincides with the probable increase in the proportion of NL in the population of rules by means of the selection effect, as note above.

The effect of the litigation cost term on the right-hand side, as before, is to weigh in favor of the rule that involves lower litigation costs. To reiterate, if this term is positive, no liability results in more suits, which tends to make strict liability more efficient. Conversely, if this term is negative, strict liability results in more suits, which tends to make no liability more efficient. In terms of the evolution of the law, this term therefore continues to work in the right direction through the selection effect to favor the rule that results in lower litigation costs per accident.

7. Conclusion

This paper has developed an equilibrium model of legal change to assess the claim that the common law process has an inherent tendency to evolve toward efficiency. The paper contributes to the literature on the social value of lawsuits, invisible hand models of the evolution of the law, and models of judicial decision making. The goals were, first, to derive the steady state equilibrium distribution of legal rules, and second, to identify the relative impacts of selective litigation, judicial bias, and precedent on the resulting distribution of legal rules. The main conclusion is that there does exist a tendency for the law to evolve in the direction of efficiency based entirely on the self-interested efforts of litigants, though the effect will not generally result in complete elimination of inefficient laws in the steady state. Further, judicial bias can either enhance or offset this effect, possibly leading the law toward or away from efficiency.

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