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Standard of proof and volume of litigation: A comparative perspective

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Abstract

This paper explores the effect of the standard of proof on the level of litigation. A comparative perspective is adopted to study the consequences of the high standard applying in the civil law tradition as opposed to the low standard (preponderance of evidence) applicable in the common law tradition. To this end, I build on the canonical asymmetric information model, further assuming that a stronger standard of proof decreases the plaintiff's probability of success at trial. With this interpretation, the suit and the settlement probabilities are shown to decrease as the standard of proof becomes more rigorous, everything else being equal. Thus, the analysis suggests that the standard of proof may be part of the explanation for differences in litigation activity patterns across countries.

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1 Introduction

The volume of litigation is a major factor contributing to increase the cost of judicial systems and the length of civil proceedings. It is now well established that procedural rules have an impact on litigation activities, most notably through their influence on litigants' decisions to go to court and to negotiate prior to trial. In this sense, many procedural reforms have been implemented to deal with frivolous claims and to promote the settlement of disputes. This paper explores the effect of the standard of proof on the volume of litigation in a comparative perspective. The standard of proof strongly differs between the civil law and the common law legal tradition (Clermont and Sherwin 2002). In the civil law system, the adjudicator has to be convinced that the burdened litigant's position is meritorious without the shadow of a doubt before ruling in his favor, which corresponds to a high standard of proof (around 90%). In common law countries, civil claims must be proved by a preponderance of the evidence: The litigant whose version is more probably true than not true with regard to evidence wins the case (standard of 50%).

In this article, I build on the canonical asymmetric information model (Bebchuk 1984), further assuming that a stronger standard of proof decreases the plaintiff's probability of success at trial. The results suggest that a low standard of proof is associated to a higher level of judicial activity than a high standard, with more frivolous claims and pretrial settlements. Frivolous claims are shown to be less frequent as the standard becomes more rigorous: The share of potential weak cases automatically increases with the standard, but this effect is more than offset by the reduction in plaintiffs' incentives to sue. The settlement rate also decreases with the standard, since defendants become less prone to negotiate. As a result, one expects higher claim and settlement rates in common law countries than in civil law countries.

The paper relates to the voluminous literature on pretrial negotiations considering asymmetric information as a source of bargaining failure (Bebchuk 1984, Reinganum and Wilde 1986, Spier 1992, Farmer and Pecorino 2002). It also departs from the literature on the standard of proof, which has been studied as a tool to minimize legal errors in a civil or criminal context (Kaye, 1982, Davis, 1994, Rubinfeld and Sappington, 1987, Miceli, 1990), and/or to deter unlawful behaviors (Lando 2002, Demougin and Fluet 2006, Ganuza *et al.* 2012). Finally, articles dealing with the allocation of trial costs (Gong and McAfee 2000, Emons 2008) or the proceedings governing the discovery of evidence (Froeb and Kobayashi 1996, Parisi 2002, Huang 2009) can also be mentioned because they address the issue of litigation in a comparative perspective. The organization of this article is as follows. Section 2 describes the framework of the model which is developed in Section 3. Section 4 analyzes the results and Section 5 presents a comparative statics analysis. Section 6 offers two possible extensions and Section 7 concludes.

2 Framework

Two risk-neutral parties are involved in litigation. The plaintiff (P) has suffered a loss and considers the defendant (D) as liable. The game plays as follows:

1. P decides whether to file suit against D.
2. D makes a take-it-or-leave-it settlement offer ($S \geq 0$) to P.

3. P accepts or rejects the offer.
4. In case of rejection, the judge decides the case on the basis of the evidence brought by P.

At the first stage, P initiates a lawsuit if the expected value of the claim is positive, which comes at a cost denoted F. During negotiations (stages 2 and 3), there is some asymmetry of information. P knows which evidence he will be able to collect against his opponent (denoted x) but D only knows that x is distributed according to a given cumulative distribution function denoted $G(.)$. The information advantage is given to P since he generally has the burden of submitting evidence, and therefore he is in a better position than his opponent to estimate his odds of success. Moreover, this assumption implies that parties negotiate early in pretrial proceedings since evidence has not been communicated yet. Thus, the model does not apply when the burden is shifted to the defendant or when parties negotiate after the discovery.

At the last stage, the judge decides the case by comparing the evidence brought by P (x) to the standard of proof (denoted λ). P wins the case and receives a compensation J if he meets the required standard ($x \geq \lambda$). Hence, a stronger standard makes it more difficult for P to win the case.[1] There are two types of plaintiffs: 'High-type' plaintiffs possess enough evidence to prevail at trial ($x \geq \lambda$) while 'low-type' plaintiffs lack evidence ($x < \lambda$). A suit is referred to as "meritorious" in the first case and as "frivolous" in the second one. Note that the evidentiary process is simplified so that only P comes with evidence, and D does not reply, which excludes the possibility of a competition in evidence. Thus, the model applies when the outcome of the case primarily relies on a piece of evidence brought by the plaintiff, and to a very limited extent on D's defense. Finally, C_p and C_d denote P's and D's trial costs and it is assumed that $J - C_p > F$, which ensures that it is in P's interest to file a lawsuit if she is certain to win the trial.

3 Equilibrium

Given the assumptions, a pooling or a semi-separating equilibrium may occur depending on the value of the standard of proof.[2]

Pooling equilibrium The game displays a pooling equilibrium in which all P types file a suit and accept D's offer. Since both P types send the same signal, D's updated belief that his rival is a low-type P corresponds to the prior belief $G(\lambda)$. At stage 3, a low-type P accepts any offer $S \geq 0$ while a high-type P accepts to settle if $S \geq J - C_p$.[3] One step backward, D's expected loss is $(1 - G(\lambda))(J + C_d)$ if he proposes $S = 0$ (which is accepted by low-type P) and S if he proposes $S = J - C_p$ (which is accepted by all P types). The first strategy is of interest for D if $(1 - G(\lambda))(J + C_d) < J - C_p$, which is the case if the standard of proof is high enough ($\lambda \geq \bar{\lambda}$, with $\bar{\lambda} = G^{-1}(\frac{C_p + C_d}{J + C_d})$). Otherwise ($\lambda < \bar{\lambda}$), D

[1] The paper abstracts from other potential determinants of the strength of cases, like the ability of lawyers or the relative wealth of the parties. Although such features are likely to influence litigants' strategies, there is no reason to expect them to induce systematic bias between the various countries.

[2] The equilibrium concept used is that of a sequential equilibrium (Kreps and Wilson, 1982).

[3] P is assumed to accept the offer when he is indifferent between accepting or rejecting it.

proposes a high offer ($S = J - C_p$) which is accepted by all P types.[4] At stage 1, the pooling equilibrium holds if all P types file a suit, which is the case if D makes a generous offer at stage 2 (i.e. if $\lambda < \bar{\lambda}$). Indeed, if $S = 0$, low-type P accept such offer (i.e. they drop the claim) and bear a loss equal to the filing costs F. It is consequently not in their interest to file a lawsuit.[5] Let γ denote D's beliefs about the probability that P has not enough evidence to prevail given that he has sued him.

Proposition 1 *If $\lambda < \bar{\lambda}$, a pooling equilibrium occurs in which P brings an action irrespective of the evidence he has. The characteristics of this equilibrium are the following:*

(i) At stage 1, P files a suit
(ii) At stage 2, D proposes $S^* = J - C_p$
(iii) At stage 3, P accepts D's offer
(iv) $\gamma^* = G(\lambda)$

Semi-separating equilibrium A semi-separating equilibrium may occur in which P brings a claim if he has collected enough evidence to prevail at trial but adopts a mixed strategy otherwise, and D adopts a mixed strategy by alternating between high and low offers. At stage 3, a low-type P accepts any offer $S \geq 0$ while a high-type P accepts to settle if $S \geq J - C_p$. At stage 2, D proposes an offer equal to $S = J - C_p$ with a probability δ and $S = 0$ otherwise. δ is such that a low-type P is indifferent between suing (in which case his expected utility is $EU_p = \delta(J - C_p - F) + (1 - \delta)(-F))$ or not suing (in which case $EU_p = 0$). Therefore, we have:

$$\delta = \frac{F}{J - C_p} \tag{1}$$

At stage 1, a low-type P sues with a probability β ($0 < \beta < 1$), the value of β being such that D is indifferent between proposing $S = 0$ (in which case $EU_d = (1 - \gamma)(-J - C_d)$) or $S = J - C_p$ (in which case $EU_d = -J + C_p$), where the probability that P fails to meet the standard given that he has sued (γ) is determined by means of the Bayes rule:

$$\gamma = \frac{\beta G(\lambda)}{\beta G(\lambda) + 1 - G(\lambda)} \tag{2}$$

which gives:

$$\beta = \frac{1 - G(\lambda)}{G(\lambda)} \frac{C_d + C_p}{J - C_p} \tag{3}$$

The value of β is positive and inferior to unity when $\lambda \geq \bar{\lambda}$.

Proposition 2 *A semi-separating equilibrium occurs if $\lambda \geq \bar{\lambda}$, and describes a situation in which P always brings an action if he has sufficient evidence to convince the adjudicator, and P brings an action only with a certain probability if he lacks evidence. The characteristics of this equilibrium are the following:*

[4] It would not be rational to propose a positive offer inferior to $J - C_p$. The acceptation rate would be the same than with $S = 0$ but D would bear a higher loss if it is accepted.

[5] A pooling equilibrium in which P never sues is not possible due to the assumption $J - C_p > F$ which makes the decision to sue profitable for high-type P.

(i) At stage 1, P files with a probability $\beta = \frac{1-G(\lambda)}{G(\lambda)}\frac{C_d+C_p}{J-C_p}$ *if* $x < \lambda$*; P files if* $x \geq \lambda$

(ii) At stage 2, D offers $S^* = J - C_p$ *with a probability* $\delta = \frac{F}{J-C_p}$ *and* $S^* = 0$ *otherwise*

(iii) At stage 3, P rejects D's offer if $x \geq \lambda$ *and if* $S^* = 0$*; otherwise P accepts the offer*

(iv) $\gamma^* = \frac{C_d+C_p}{J+C_d}$

4 Implications

The effect of the standard of proof on litigants' strategies is represented by Figure 1. A low standard ($\lambda < \bar{\lambda}$) is associated to a probability of claim equal to unity. In that case, all plaintiff types file a suit to obtain a negotiated compensation from the defendant which is high enough to cover their filing costs. Instead, a high standard of proof ($\lambda \geq \bar{\lambda}$) is associated to a claim rate inferior to unity: High-type plaintiffs still file a lawsuit but low-type plaintiffs have less incentives to do likewise, since defendants are less often generous during negotiations.

Result 1 *P always sues if* $\lambda < \bar{\lambda}$ *and P sues with a probability* $G(\lambda)\beta(\lambda) + (1 - G(\lambda))$ *also equal to* $(1 - G(\lambda))\frac{J+C_d}{J-C_p}$ *otherwise.*

Reasoning in marginal terms, there is a negative relationship between the probability of suit and the standard of proof (for $\lambda \geq \bar{\lambda}$). To explain this result, consider that the probability of a suit is composed of two terms: The probability of a frivolous suit $G(\lambda)\beta(\lambda)$ and the probability of a meritorious suit $(1-G(\lambda))$. Both probabilities are shown to decline as the standard increases. Regarding frivolous suits, a higher standard increases the share of low-type plaintiffs $G(\lambda)$ —which in turn increases the suit probability— but low-type plaintiffs are less willing to file a suit ($\frac{\partial\beta}{\partial\lambda} < 0$). Indeed, D reassesses the probability that the plaintiff has a weak case (γ) upward as the standard increases. To compensate this effect and leave the defendant indifferent between a low and a high offer, low-type plaintiffs have to sue less often (i.e. β has to decrease). Overall, the second effect dominates the first one and therefore, the probability of frivolous claim declines with the standard despite the higher share of low-type plaintiffs. Regarding meritorious claims, a higher standard mechanically decreases the probability of meritorious claims, which reinforces the negative relationship between the standard and the probability of suits.

The model also gives an insight into the relationship between the standard of proof and parties' propensity to settle. If $\lambda < \bar{\lambda}$, litigants always reach an agreement. As the plaintiff can easily convince the court of the defendant's liability, the defendant makes a generous offer ($S = J - C_p$) which is always accepted by the plaintiff. By contrast, a rigorous standard ($\lambda \geq \bar{\lambda}$) is susceptible to impede negotiations. The defendant either proposes a high or a low offer, but high-type plaintiffs reject low offers. In that case, the probability of settlement given that a suit has been filed is equal to the probability that D makes a high offer (δ) if $x \geq \lambda$ and to the probability of suits (β) if $x < \lambda$ (since all cases are settled in this case), which gives $(1 - G(\lambda))\delta + G(\lambda)\beta(\lambda)$.

Result 2 *The settlement probability given that a suit has been filed is equal to one if* $\lambda < \bar{\lambda}$ *and to* $(1 - G(\lambda))\delta + G(\lambda)\beta(\lambda)$ *also equal to* $(1 - G(\lambda))\frac{F+C_d+C_p}{J-C_p}$ *if* $\lambda \geq \bar{\lambda}$*.*

At the margin, the probability of settlement —given that a suit has been filed— decreases with the standard of proof. The first term $(1-G(\lambda))\delta$ (see Result 2) denotes the probability that a meritorious claim is settled. An increase in the standard automatically reduces the probability of settlement since less claims are meritorious. The second term $G(\lambda)\beta(\lambda)$ is the probability of settlement in case of a frivolous claim and corresponds to the probability of a frivolous claim since all such claims are settled at the equilibrium. As noted above, this probability also decreases with the standard. Thus, an increase in the standard results in a lower probability of settlement because of a selection effect by which low-type plaintiffs are more reluctant to go to trial.

5 Comparative statics

The results of the model are influenced by several parameters, namely the amount of the compensation (J), court filing costs (F) and trial costs (C_d and C_p). This Section investigates the effect of these parameters on the claim and the settlement probabilities at the equilibrium. The results are summarized in Table 1 and can be formulated as follows:

Result 3 *At the equilibrium:*

(i) An increase in trial costs (C_d and C_p) increases both the claim and the settlement probabilities.

(ii) An increase in filing costs (F) increases the probability of settlement but leaves the claim probability unchanged.

(iii) An increase in the compensation (J) decreases both the claim and the settlement probabilities.

First (i), an increase in trial costs (C_d and/or C_p) positively affects the claim and the settlement probabilities through the threshold $\bar{\lambda}$. From the defendant's viewpoint, such increase makes a negotiated agreement more profitable than a trial, everything else being equal. Hence, the threshold $\bar{\lambda}$ is shifted towards unity, which leads to more pooling equilibria. Furthermore, an increase in trial costs positively affects the claim and the settlement probabilities if $\lambda \geq \bar{\lambda}$. Indeed, low-type P sue more often (β increases) and D is more generous during negotiations (δ increases).[6] Second (ii), increasing filing costs leads to more generous offers from D (δ increases) if $\lambda \geq \bar{\lambda}$ which in turn favors settlements.[7] However, plaintiffs do not base their decisions to sue on filing costs,[8] and the threshold ($\bar{\lambda}$) is also

[6] An increase in C_p reduces the amount of the high settlement offer ($S = J - C_p$) and an increase in C_d makes the trial option more costly, which encourages D to propose $S = J - C_p$ rather than $S = 0$. Low-type P sue more often (β increases) to ensure that D remains indifferent between the two offers. Parties settle more often, because of the increase in β and in δ. Indeed, D is more generous during negotiations as C_p increases for low-type P to remain indifferent between going to court or not.

[7] Since D's offer is such that low-type P are indifferent between suing or not suing, an increase in F must be offset by a higher probability of a generous offer.

[8] A plaintiff with a strong case always files a suit, due to the assumption $J - C_p > F$. A low-type P adopts a mixed strategy if $\lambda \geq \bar{\lambda}$, by bringing the matter before a court with a probability β. In this case, β is such that D is indifferent between proposing a high or a low offer. Thus, β depends on the defendant's expected utility and not on the filing costs incurred by P.

unaffected by such costs.[9] Third (iii), a small increase in the compensation awarded by the court (J) reduces the claim and the settlement probabilities through the threshold $\bar{\lambda}$.[10] This effect is reinforced when $\lambda \geq \bar{\lambda}$: An increase in J reduces the probability of frivolous claims (β decreases) and makes D less generous (δ decreases).[11]

Hence, some differences across countries may affect the results of the model. For instance, the cost of pursing a civil action has been estimated to be $38,200 in the Ontario court in Canada, $15,000 in the federal courts of the United States and while it varies between 5,000 and 10,000 euros in the European Union (Deffains and Desrieux 2014). If legal costs are larger in common law countries, one expects the claim and the settlement probabilities to be higher in those countries which would support the main point of the paper. This results in large part from the higher threshold $\bar{\lambda}$: The defendant has stronger incentives to avoid a trial and to adopt a pure strategy (high offer) in this context. By contrast, lower judicial costs in civil law countries encourage defendants to adopt mixed strategies by alternating between low and high offers. However, if damages are higher in common law countries (which may be the case due to the possibility courts have to award punitive damages), this may affect the claim and settlement probabilities in the opposite direction.

6 Extensions

In this Section, I introduce the issue of legal errors (Section 6.1) and the possibility that trial costs are shifted to the loosing party (Section 6.2) into the analysis.

6.1 Legal errors

Consider now that D has exerted high care with a probability p_H and low care with a probability p_L. The evidence held by P (denoted x) is distributed according to a cumulative function $G_i(.)$ $i = L, H$ with $G_L(.) < G_H(.)$, which means that P is more likely to hold any evidence if D has not exerted care. Litigants know whether D has exerted care and observe the cumulative functions, but not the judge who decides the case by comparing x to the required standard of proof (λ). Within this new framework, $p_H(1 - G_H(\lambda))$ is the probability that D loses the trial while he has exerted due care (type-I error) and $p_L G_L(\lambda)$ is the probability that D wins the case while he has acted negligently (type-II error). Thus, a stronger standard increases the probability of type-I error and decreases that of type-II errors, which is in line with the literature (e.g. Davis 1994).

At the equilibrium, two thresholds characterize parties' behaviors, $\bar{\lambda}_H$ and $\bar{\lambda}_L$ ($\bar{\lambda}_H < \bar{\lambda}_L$), which implies three regions (instead of two) defining the equilibria of the game.[12] Low-type P always file suit if $\lambda < \bar{\lambda}_H$ and always adopt a mixed strategy if $\lambda \geq \bar{\lambda}_L$. In addition, there

[9]The threshold $\bar{\lambda}$ defines the standard of proof up to which, for a given level of evidence, D does not systematically make a generous offer, and hence it depends on D's expected utility.

[10]The threshold is pushed towards zero since the pure strategy (high offer) becomes less attractive than the mixed strategy (alternating between high and low offers), everything else being equal.

[11]The reduction in β ensures that D remains indifferent between the two offers. The settlement probability also drops if $\lambda \geq \bar{\lambda}$, which is a consequence of the reduction in β and of the increase in δ. Indeed, D is more generous during negotiations for low-type P to remain indifferent between suing or not.

[12]The thresholds are $\bar{\lambda}_i \equiv G_i^{-1}(\frac{C_p+C_d}{J+C_d})$ $\forall i = H, L$.

is an intermediary region ($\lambda_H \leq \lambda < \lambda_L$) in which low-type P adopt a pure strategy if D has not exerted care, and adopt a mixed strategy otherwise. The probabilities of claim and settlement are displayed in Table 2.

The general results are along the same line as those presented in Section 4 and lead to some additional conclusions concerning the effect of legal errors. First, for low values of the standard of proof, there is no trial and therefore the outcome of the game does not depend on legal errors. Second, the claim and the settlement probabilities increase with type-I errors. Indeed, P is more likely to file suit even if D has exerted due care if he can falsely prove the contrary, and D is more likely to make a generous offer, even if he has exerted care. Third, the claim and settlement probabilities are found to decrease with type-II errors. In that case, P has difficulties to prove the facts although D has failed to exert due care. Consequently, P is less likely to go to court, and negotiations are more likely to fail.

6.2 Fee shifting

The results presented in Section 4 apply when each litigant bears his own trial costs (American rule). Consider now that the successful party recovers the full trial costs from his opponent (English rule), so that P's (resp. D) expected utility is $EU_p = J$ (resp. $EU_d = 0$) in case of victory at trial and $EU_p = -C_p - C_d$ (resp. $EU_d = -J - C_d - C_p$) if he loses. The model is solved as previously but a new threshold denoted $\bar{\lambda}'$ separates the two types of equilibria.[13] This threshold is lower than the previous one ($\bar{\lambda}' < \bar{\lambda}$) which encourages defendants to adopt a mixed strategy rather than systematically proposing a high offer. In addition, when $\lambda \geq \bar{\lambda}'$, the probabilities of claim and settlement are computed as previously but with different values of β and δ:[14] A low-type P is less likely to go to court ($\beta' < \beta$) and D is less generous during negotiations ($\gamma' < \gamma$). Overall, the new allocation of trial costs does not modify the general results of the model, but tends to discourage frivolous claims and settlements.

7 Conclusion

This paper departs from the observation that the standard of proof is higher in civil law countries than in the common law tradition, and investigates the impact of such institutional difference on the volume of litigation. The results of the model suggest that litigants have stronger incentives to go to court and to find an agreement in common law countries than in civil law countries, which echoes some empirical facts. For instance, Ramseyer and Rasmusen (2013) report a higher litigation rate in USA and in England than in France, and litigants seem to be more likely to settle in the common law tradition (Haravon 2010), which has led some authors to speak of the "decline of the trial" in USA (Galanter 2004). Such comparative empirical investigations are left for further research. Another avenue would consist in introducing some competition in evidence into the model, by allowing the defendant to bring some evidence to defend his position.

[13] The new threshold is $\bar{\lambda}' \equiv \frac{C_d + C_p}{J + C_d + C_p}$.

[14] The probability of claim is $1 - G(\lambda) + \beta' G(\lambda)$ and the probability of settlement given that a suit has been filed is $\beta' G(\lambda) + \delta'(1 - G(\lambda))$, with $\beta' = \frac{1-G(\lambda)}{G(\lambda)} \frac{C_d + C_p}{J}$ and $\delta' = \frac{F}{J}$.

References

Bebchuk, L. A. (1984). "Litigation and Settlement Under Imperfect Information". *The RAND Journal of Economics*, 15-3:404–415.

Clermont, K. M. and Sherwin, E. (2002). "A comparative view of standards of proof". *American Journal of Comparative Law*, 50:243–275.

Davis, M. L. (1994). "The Value of the Truth and the Optimal Standard of Proof in Legal Disputes". *Journal of Law, Economics and Organization*, 10-2.

Deffains, B. and Desrieux, C. (2014). "To litigate or not to litigate? the impacts of third-party financing on litigation". *International Review of Law and Economics*.

Demougin, D. and Fluet, C. (2006). "Preponderance of evidence". *European Economic Review*, 50:963–976.

Emons, W. (2008). "Conditional and Contingent Fees: A Survey of some Recent Results". In Eger, T., Bigus, J., Ott, C., and von Wangenheim, G., editors, *Internationalisierung des Rechts und seine Ökonomische Analyse*, pages 327–335. Gabler.

Farmer, A. and Pecorino, P. (2002). "Pretrial bargaining with self-serving bias and asymmetric information". *Journal of Economic Behavior & Organization*, 48(2):163 – 176.

Froeb, L. M. and Kobayashi, B. H. (1996). "Naive, Biased, Yet Bayesian: Can Juries Interpret Selectively Produced Evidence?". *Journal of Law, Economics and Organization*, 12:257–76.

Galanter, M. (2004). "The Vanishing Trial: An Examination of Trials and Related Matters in Federal and State Courts. *Journal of Empirical Legal Studies*, 1-3:459–570.

Ganuza, J. J., Gomez, F., and Penalva, J. (2012). "Minimizing Errors, Maximizing Incentives: Optimal Court Decisions and the Quality of Evidence". Working paper.

Gong, J. and McAfee, R. P. (2000). "Pretrial negotiation, litigation, and procedural rules". *Economic Inquiry*, 38:218–238.

Haravon, M. (2010). "Quel procès civil en 2010 ? Regard comparé sur l'accès à la justice civile en Angleterre, aux Etats-Unis et en France". *Revue internationale de droit comparé*, 62(4):895–929.

Huang, K.-C. (2009). "Does Discovery Promote Settlement? An Empirical Answer". *Journal of Empirical Legal Studies*, 6:241–278.

Kaye, D. (1982). "The Limits of the Preponderance of the Evidence Standard: Justifiably Naked Statistical Evidence and Multiple Causation". *Law & Social Inquiry*, 7:487–516.

Kreps, D. M. and Wilson, R. (1982). "Sequential Equilibria". *Econometrica*, 50(4):863–94.

Lando, H. (2002). "When is the Preponderance of the Evidence Standard Optimal?". *The Geneva papers on risk and insurance*, pages 602–608.

Miceli, T. J. (1990). "Optimal Prosecution of Defendants Whose Guilt is Uncertain". *Journal of Law, Economics, & Organization*, 6-1:pp. 189–201.

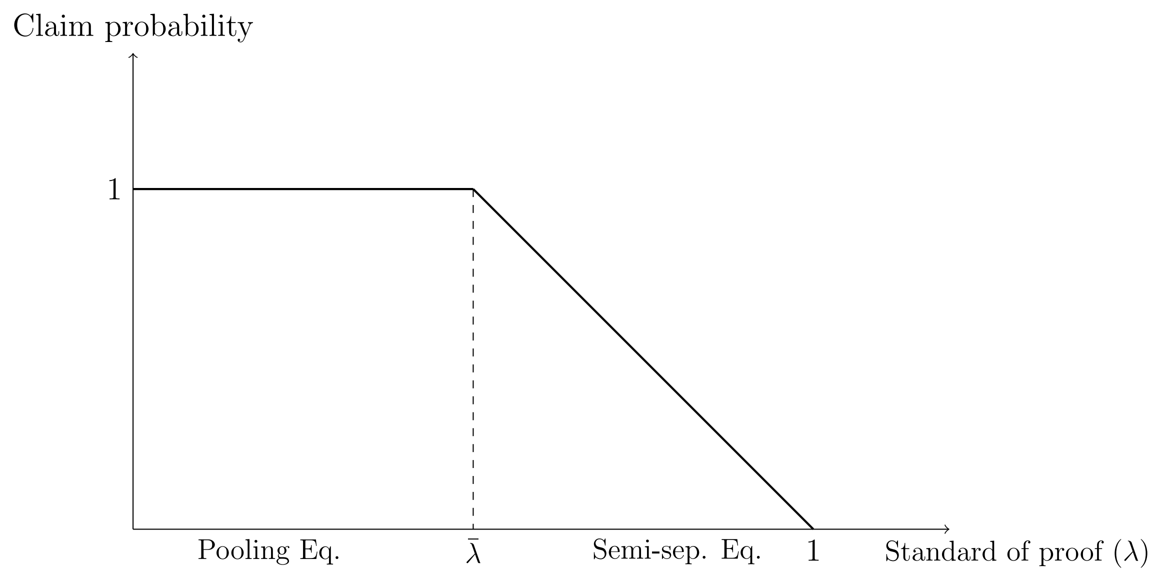
Parisi, F. (2002). "Rent-seeking through litigation: Adversarial and inquisitorial systems compared". *International Review of Law and Economics*, 22(2):193 – 216.

Ramseyer, J. M. and Rasmusen, E. B. (2013). "Are Americans More Litigious? Some Quantitative Evidence". In Buckley, F. H., editor, *The American Illness: Essays on the Rule of Law*. Yale Scholarship Online.

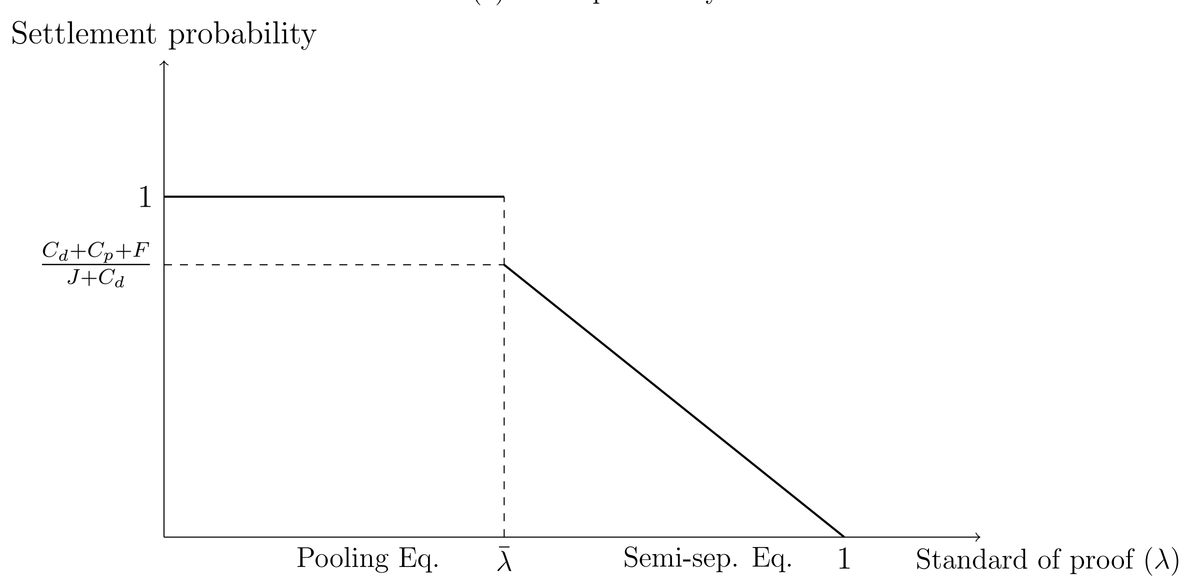
Reinganum, J. F. and Wilde, L. L. (1986). "Settlement, Litigation, and the Allocation of Litigation Costs". *The RAND Journal of Economics*, 17-4:pp. 557–566.

Rubinfeld, D. L. and Sappington, D. (1987). "Efficient Awards and Standards of Proof in Judicial Proceedings". *RAND Journal of Economics*, 18(2):308–315.

Spier, K. E. (1992). "The Dynamics of Pretrial Negotiation". *The Review of Economic Studies*, 59(1):93–108.



(a) Claim probability



(b) Settlement probability given that a suit has been filed

Figure 1: Effect of the standard of proof on litigants' strategies

Table 1: Results of comparative statics

	Effect of F on	**Effect of C_d on**	**Effect of C_p on**	**Effect of J on**
Claim probability (if $\lambda \geq \bar{\lambda}$)	0	+	+	−
Settlement probability (if $\lambda \geq \bar{\lambda}$)	+	+	+	−
Threshold $\bar{\boldsymbol{\lambda}}$	0	+	+	−

Table 2: Claim and settlement probabilities when errors may occur

	Claim probability	**Settlement probability**
$\lambda < \bar{\lambda}_H$	1	1
$\bar{\lambda}_H \leq \lambda < \bar{\lambda}_L$	$p_L + p_H(1 - G_H(\lambda))\frac{J+C_d}{J-C_p}$	$p_L + p_H(1 - G_H(\lambda))\frac{F+C_d+C_p}{J-C_p}$
$\lambda \geq \bar{\lambda}_L$	$[p_L(1 - G_L(\lambda)) + p_H(1 - G_H(\lambda))]\frac{J+C_d}{J-C_p}$	$[p_L(1 - G_L(\lambda)) + p_H(1 - G_H(\lambda))]\frac{F+C_d+C_p}{J-C_p}$