FINANCIALLY-CONSTRAINED LAWYERS*

CLAUDIA M. LANDEO† and MAXIM NIKITIN‡

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Abstract

Financial constraints reduce the lawyers’ ability to file lawsuits and bring cases to trial. As a result, access to justice for true victims, bargaining impasse, and care-taking incentives for potential injurers might be compromised. We present the first cradle-to-grave model of legal disputes involving financially-constrained lawyers, third-party lawyer lending, and asymmetric information. In equilibrium, access to justice is denied to some true victims and bargaining impasse occurs. Counterintuitively, policies that relax lawyers’ financial constraints might be welfare reducing if the positive impact on access to justice is weak and the potential injurers are overdeterred.

KEYWORDS: Access to Justice; Social Welfare; Lawsuits; Litigation; Deterrence; Third-Party Litigation Funding; Third-Party Lawyer Lending Industry; Bargaining; Asymmetric Information

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†University of Alberta, Department of Economics. Henry Marshall Tory Building 7-25, Edmonton, AB T6G 2H4, Canada. landeo@ualberta.ca; corresponding author.
‡International College of Economics and Finance, NRU HSE. Shabolovka 26, Moscow 119049, Russia. mnikitin@hse.ru.
1 Introduction

The U.S. tort system provides $172 billion in gross compensation to plaintiffs each year. Litigation expenses, which are generally covered by personal injury attorneys on behalf of their clients, represent $5.2 billion of this compensation (Freeman Engstrom, 2014). The average cost of taking a medical malpractice claim to trial is $97,000 (Shepherd, 2014). Expenses on expert witnesses in the $50,000-$100,000 range are not uncommon (Trautner, 2009). As cases become more complex and hence, more expensive, attorneys might experience financial constraints. Financial constraints weaken the attorneys’ ability to file lawsuits and bring cases to trial. As a result, access to justice for true victims is compromised. In a recent survey (Shepherd, 2014), seasoned medical malpractice lawyers were asked whether they would accept a medical malpractice case with less than $50,000 in certain damages. Only 1.18 percent of the attorneys responded positively. Moreover, 50 percent of the attorneys stated that they would not accept to represent a victim with damages lower than $250,000. Over 75 percent of the attorneys indicated that they rejected more than 90 percent of cases due to insufficient damages and/or high litigation expenses.

By affecting the pool of filed cases, lawyers’ financial constraints might influence bargaining impasse and care-taking incentives for potential injurers, in addition to impacting access to justice. Policy debate has been centered on the effects of lawyers’ financial constraints on access to justice, however. Previous theoretical work on legal disputes has simply abstracted from lawyers’ financial constraints. Our paper aims to fill these gaps. We present the first theoretical study of legal disputes in an environment characterized by financially-constrained lawyers, and provide social welfare analysis of empirically-relevant policies.

Traditionally, financing of litigation has involved attorneys’ own funding, fellow attorneys’ contributions, and bank loans. In the late 1990s, lawyer lenders such as Counsel Financial, among others, started funding activities (Freeman Engstrom, 2014). These lawyer lending institutions specialize on providing recourse loans (non-contingent loans) to cover the expenses associated with particular legal cases. In contrast to traditional banks, these lenders do not require lawyers’ personal assets as collaterals. Instead, the loans are secured by the law firm’s assets, including future fees. The loans involve significantly larger sums and the interest charged is higher than the traditional bank’s interest (around 15-20 percent per year). Our

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1 Specifically, the survey question involves a 95 percent likelihood of succeeding at trial.
2 Loans are secured by the estimated value of a firm’s total portfolio of cases. Lenders generally require access to the firm’s entire docket of cases and assets (Freeman Engstrom, 2014).
3 More recently, a new type of lawyer lending institutions, specialized on non-recourse loans (i.e., loans with
theoretical framework also captures the role of the lawyer’s lender industry on legal disputes.

We model the interaction between a defendant, a plaintiff, and a plaintiff’s attorney as a sequential game of incomplete information. Our framework is characterized by financially-constrained lawyers, third-party lawyer lending, and asymmetric information. The source of information asymmetry is the merit type of the plaintiff’s case, which is unknown by the defendant. Our original framework depicts legal disputes from cradle to grave. In particular, our model allows for endogenous care-taking decisions, filing, and out-of-court settlement decisions. We model lawyers’ financial constraints by incorporating real-world characteristics of the third-party lawyer lending industry. We construct an equilibrium that includes empirically-relevant features: Accidents do occur in equilibrium; some cases are filed; some lawsuits are dropped, some are resolved out-of-court, and some go to trial. Access to justice is denied to some true victims in equilibrium.

We then assess the effects of policies aimed at lowering the costs associated with legal disputes, and provide social welfare analysis. The interest charged to lawyers by third party lenders and the costs associated with expert witnesses’ fees are examples of such costs. Our findings suggest that cost-reducing policies relax the lawyers’ financial constraints. As a result, more low-merit cases are filed. The uninformed defendant reacts by reducing his out-of-court settlement offer, and the likelihood of trial increases. Higher expected litigation costs for the defendant are observed, which increase his care-taking incentives, and lower the probability of an accident. Our results also indicate that cost-reducing policies do not generally benefit true victims or their lawyers: Only low-merit victims whose cases now can proceed to trial are better off; the effect on the attorneys is unambiguously positive only in low-merit cases. Counterintuitively, we demonstrate that a relaxation of the lawyers’ financial constraints might reduce social welfare if the positive effect on access to justice by true victims is weak and the defendant is overdeterred. The intuition is as follows. As a result of relaxing the lawyer’s financial constraints, only few additional true victims get access to justice. In contrast, too many cases proceed to costly trial, and too many resources are spent on accident prevention to avoid costly litigation.

Finally, we extend our benchmark model to conduct social welfare analysis of cost-shifting policies. Several U.S. states have enacted policies that allow attorneys to calculate their repayment contingent on case success), has emerged. This segment of the lawyer lending industry has not experienced significant growth (Freeman Engstrom, 2014).

Policies devoted to strengthening competition in the lawyer lending industry might reduce lawyers’ financial costs. Similarly, policies designed to increase efficiency of legal procedures and to reduce unpredictability of the legal system might lower the costs associated with litigation (Landeo et al., 2007a, 2007b).
contingency fee from the net client’s recovery (i.e., after deducting the litigation costs). Then, attorneys effectively shift a portion of the litigation costs to their clients. We show that these policies also relax the lawyers’ financial constraints, and hence, exhibit the same potential negative welfare effects observed in cost-reducing policies.

Important policy implications follow from our work. Legal commentators are currently proposing the extension of cost-shifting policies by allowing lawyers to shift the financial costs of loans to their clients, in addition to the litigation costs (Freeman Engstrom, 2014). They argue that these policies will be welfare-enhancing. We contribute to this debate by underscoring the importance of assessing cost-shifting policies in terms of their effects on access to justice for true victims and their effects on care-taking incentives for potential injurers. In particular, our analysis, which also applies to this type of cost shifting policies, suggests that these reforms might reduce social welfare.

Our work provides significant contributions to the theoretical law and economics literature on litigation. To the best of our knowledge, Landeo et al. (2007b) and Hylton (2002, 1993) are the only three papers that analyze liability and litigation using asymmetric-information models that allow for endogenous care-taking decisions, filing and bargaining impasse. We extend this literature by providing the first formal analysis of legal disputes in an environment that allows for financially-constrained lawyers and third-party lawyer lending, in addition to asymmetrically-informed litigants; and, by incorporating the assessment of access to justice to the welfare analysis of public policies.

Our paper is also related to the small theoretical literature on third-party financing of litigation (Avraham and Wickelgren, 2014; Daughety and Reinganum, 2014; Deffains and Desrieux, forthcoming; Demougin and Maultzsch, 2014). These previous studies are focused on the effects of third-party plaintiff lending on bargaining impasse. Our work enhances the understanding of the third-party litigation funding industry by focusing on third-party lawyer lending. In contrast to the previous literature, our framework allows for the analysis of access to justice for true victims, care-taking incentives for potential injurers, filing incentives for lawyers, and social welfare, in addition to the analysis of bargaining impasse.

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5 U.S. states generally allow lawyers to deduct their contingency fees from the plaintiffs’ gross or net recovery, requiring only that the clients be informed “whether ... expenses are to be deducted before or after the contingent fee is calculated” (Model Rules of Professional Conduct, R. 1.5 (c)). New York, Kansas, and New Jersey explicitly require that litigation costs be deducted before the contingency fee is calculated.


7 Daughety and Reinganum (2014) also study care-taking incentives for potential injurers.
The rest of the article is organized as follows. Section Two presents the setup of the benchmark model. Section Three outlines the equilibrium analysis. Section Four discusses the effects of a cost-reducing policy on equilibrium strategies and payoffs. Section Five provides a social welfare analysis of a cost-reducing policy. Section Six extends our benchmark model to study the social welfare effects of a cost-shifting policy. Section Seven presents concluding remarks. Appendices A and B, available online, present the formal analysis of the benchmark model and the cost-shifting model.

2 Model Setup

This section describes the game stages, the lawyer’s financial constraint component, and the no-access to justice component. It also introduces the notation.

2.1 Game Stages

We model the interaction between a potential defendant, a potential plaintiff, and a potential plaintiffs’ attorney as a sequential game of incomplete information. The source of information asymmetry is the merit type of the potential plaintiff’s case, which is unknown by the defendant. The stages of the game are as follows.

2.1.1 Care-Taking Stage

In the first stage, the potential defendant decides his level of care, which determines the probability of accident $\lambda$. The cost of care is denoted by $K(\lambda)$ with $\lim_{\lambda \to 0^+} K(\lambda) = +\infty$ and $K(1) = 0$. We assume that all potential defendants have the same cost of care, which is common knowledge. We also assume that $K(\lambda)$ is a continuous and differentiable function defined on the interval $(0, 1]$ with $\frac{\partial K(\lambda)}{\partial \lambda} < 0$, $\lim_{\lambda \to 0^+} \frac{\partial K(\lambda)}{\partial \lambda} = +\infty$, and $\lim_{\lambda \to 1^-} \frac{\partial K(\lambda)}{\partial \lambda} = 0$, and that $\frac{\partial^2 K(\lambda)}{\partial \lambda^2}$ is a continuous and differentiable function with $\frac{\partial^2 K(\lambda)}{\partial \lambda^2} > 0$. The optimal level of care, i.e., the optimal $\lambda_D$, is the one that minimizes the defendant’s total expected loss $L_D(\lambda) = K(\lambda) + \lambda l_D$, where $l_D$ is the expected litigation loss. We take the expected litigation loss as parametric in order to describe $L_D$, but ultimately $l_D$ will be derived as the continuation value of the litigation stage, and hence, it will reflect the outcomes at the litigation stage. We assume that accident occurrence is common knowledge.

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8We use the terms “potential defendant,” “potential injurer,” and “defendant” interchangeably.
If an accident occurs, Nature determines the merit of the potential plaintiff’s case and informs this to the potential plaintiff only. A sufficiently large mass $\mu$ of potential plaintiffs learn that their cases are non-meritorious (losses equal to zero), and a mass 1 of potential plaintiffs learn that they have meritorious cases (losses greater than zero). Then, the mass of potential plaintiffs is equal to $1 + \mu$. The information about the mass of non-meritorious and meritorious cases is common knowledge. If the potential plaintiff has a meritorious case, Nature determines the level of merit $A$ and informs this to the potential plaintiff only. $A$'s probability distribution function $g(A)$ and cumulative distribution function $G(A)$ are common knowledge. We assume that $g(A)$ is a continuous and differentiable function defined on the interval $(0, \bar{A}]$, where $\bar{A}$ is sufficiently large.

2.1.2 Filing Stage

If an accident occurs, the second stage starts. We assume that the mass of potential attorneys is greater than or equal to $1 + \mu$, i.e., it is sufficiently high to serve all potential plaintiffs with meritorious and non-meritorious cases. The potential plaintiff and his potential attorney meet. The attorney, who perfectly observes the potential plaintiff’s type (case merit), decides whether to take the case and file a lawsuit. We denote the mass of filed cases as $\zeta$. The attorney is hired under a contingency-fee compensation. Under this scheme, the attorney receives gross payment equal to a share $\gamma$ of the plaintiff’s gross recovery (award at trial or out-of-court settlement amount). The attorney’s share $\gamma$ is an exogenous constant, known by all parties. The filing cost for meritorious and frivolous cases are $f_M$ and $f_F$, respectively, where $f_F > f_M$ (common knowledge). The plaintiff’s attorney pays the filing cost.

2.1.3 Litigation Stage

If a lawsuit is filed, the third stage starts. The uninformed defendant makes a take-it-or-leave-it out-of-court settlement offer to the plaintiff. The plaintiff then decides whether to accept or reject the defendant’s offer. If an offer $S > 0$ is accepted by the plaintiff, then the defendant transfers the settlement amount to the plaintiff, and the game ends. Acceptance of a zero offer implies that the plaintiff drops the case. If an out-of-court settlement offer is rejected, the case proceeds to costly trial. We denote the probability of trial as $\rho$. Both litigants incur litigation costs: $C_P$ denotes the plaintiff’s litigation cost, which is paid by his attorney; and, $C_D$ denotes the defendant’s litigation cost. We assume that the court perfectly observes the plaintiff’s type. Then, non-meritorious cases never succeed at trial (they get a

\[9\text{For simplicity, our framework abstracts from searching costs.}\]
zero recovery). When a meritorious case goes to trial, the court orders the defendant to pay \( A > 0 \) to the plaintiff.\(^{10}\) The plaintiff gets \((1 - \gamma)A\) at trial and his attorney gets a net payoff of \(\gamma A - C_P - f_M > 0\).

### 2.2 Lawyer’s Financial Constraint Component

This section describes the lawyer’s financial constraint component of our model. We denote the amount of the lawyer’s own funds as \( x > f_i, i = F, M \). We assume that the lawyer is financially constrained. His own funds \( x \) are insufficient to bring a case to trial, i.e., \( x < f_i + C_P, i = M, F \). We also assume that there are available third-party lawyer lenders that can lend money to the lawyer to allow him to bring a meritorious case to trial. Third-party lending to bring non-meritorious cases to trial is not available. In order to be able to bring a meritorious case to trial, the financially-constrained attorney needs to borrow \( C_P + f_M - x \) at a net interest rate \( r \). We denote \( \tilde{A} \) as the merit threshold at which proceeding and not proceeding to trial provide the same expected payoff for the lawyer, \( \gamma \tilde{A} - C_P - f_M - (C_P + f_M - x)r = -f_M \). In other words, lawyers with cases \( A < \tilde{A} \) will not proceed to trial. Hence, \( \tilde{A} \) represents the lawyer’s financial constraint.

**DEFINITION 1.** The lawyer’s financial constraint \( \tilde{A} \) is defined as follows.

\[
\tilde{A} = \frac{C_P + (C_P + f_M - x)r}{\gamma}.
\]

Potential plaintiffs with \( A \geq \tilde{A} \) are called “high-merit cases,” and potential plaintiffs with \( 0 < A < \tilde{A} \) are called “low-merit cases.” Remember that a measure 1 represents the meritorious potential plaintiffs. It encompasses high- and low-merit potential plaintiffs. Then, \( G(\tilde{A}) \) represents the mass of low-merit potential plaintiffs, and \( 1 - G(\tilde{A}) \) represents the mass of high-merit potential plaintiffs. Remember also that \( \mu \) denotes the mass of no-merit potential plaintiffs. Then, \( 1 + \mu \) represents the mass of high-, low-, and no-merit potential plaintiffs. We denote the mass of low-merit and no-merit cases that are filed as \( \nu \). We assume that the lawyer’s financial constraint \( \tilde{A} \) is common knowledge. In particular, the plaintiff knows that the lawyer’s financial constraint allows only high-merit cases (\( A \geq \tilde{A} \)) to proceed to trial.

\(^{10}\)We assume that the court applies a strict liability rule. Under this rule, the injurer has to bear the costs of the accident regardless of the extent of his precaution. Strict liability is generally applied by courts in products liability cases.
2.3 No-Access to Justice Component

This section describes the “No-Access to Justice” component of our model. The “No-Access to Justice” component \( \eta \) represents the inability of meritorious (potential) plaintiffs to get access to justice.

**DEFINITION 2.** No-Access to Justice \( \eta \) is defined as the sum of two terms.

1. The mass of meritorious cases that are not filed.
2. The mass of meritorious cases that receive a zero offer and cannot proceed to trial.

Intuitively, the first term represents the inability of lawyers with meritorious cases to file a lawsuit. The second term represents the inability of meritorious plaintiffs to get compensation for the inflicted injury through a strictly positive out-of-court settlement transfer or an award at trial.\(^{11}\)

3 Equilibrium Analysis

In equilibrium, the lawyers’ financial constraints permeate the decisions of all the parties involved in a legal dispute. We demonstrate that the magnitude of the prevalent lawyers’ financial constraints (the state of the world) determines the merit composition of the equilibrium mass of filed cases. One of three mutually-exclusive scenarios arise in equilibrium: Case 1, under “Strong Financial Constraints;” Case 2, under “Medium Financial Constraints;” and, Case 3, under “Mild Financial Constraints.” The composition of the equilibrium mass of filed cases is as follows: All high-merit and some low-merit cases are filed in Case 1; all high- and low-merit cases are filed in Case 2; in addition to all high- and low-merit cases, some no-merit cases are filed in Case 3. Across cases, bargaining impasse occurs in equilibrium. Specifically, the uninformed defendants randomize between making a zero offer and a strictly positive offer. Due to asymmetric information, some high-merit plaintiffs receive an insufficiently high offer and proceed to costly trial, some low- and no-merit plaintiffs receive a generous offer and settle out-of-court, and some no-merit and low-merit plaintiffs receive a zero offer and need to drop their cases.

We show that access to justice for true victims is compromised. In Case 1, access to justice is affected by two sources. First, some low-merit cases are not filed. Second, among the

\(^{11}\)The specific elements included in \( \eta \) depend on the equilibrium outcomes. Please see the analysis of Case 1 in Section 5.1, and the analysis of Cases 2 and 3 in Section 2.2.3 in Appendix A.
low-merit cases filed, some plaintiffs receive a zero offer and are forced to drop their cases. Then, some low-merit plaintiffs do not get access to justice. In Cases 2 and 3, access to justice is compromised by only one source. Although all low-merit cases are filed, some low-merit plaintiffs receive a zero offer and are forced to drop their cases.\textsuperscript{12} Hence, access to justice is still denied to some true victims.

The equilibrium constitutes a perfect Bayesian equilibrium of the game under the following conditions.\textsuperscript{13}

\begin{equation}
    f_F < \gamma \bar{A}.
\end{equation}
\begin{equation}
    \mu > \frac{\int_{\bar{A}}^{\tilde{A}} (A + C_D) g(A) dA}{\bar{A}} - 1.
\end{equation}

There exists $\kappa > 0$ such that for any $A \in (\bar{A}, \tilde{A})$

\begin{equation}
    g(A) - C_D \frac{\partial g(A)}{\partial A} > \kappa.
\end{equation}

Although the model is solved formally in Appendix A, next we outline the main steps of the solution.

### 3.1 Potential Composition of the Set of Equilibrium Offers

First, we demonstrate that offers lower than zero and greater than $\bar{A}$ are not in the set of equilibrium offers. Similarly, offers greater than zero and lower than $\tilde{A}$ are not in the set of equilibrium offers. It is simple to show that these offers are strictly dominated by a zero offer.

Second, we show that a zero offer must be in the set of equilibrium offers. If a zero offer is not an equilibrium offer, then the defendant will always offer at least $\bar{A}$. Assuming that $f_F$ is low enough (ensured by condition (2)), all non-meritorious cases will be filed. The defendant will lose no less than $(1 + \mu)\bar{A}$, where $\mu$ is the measure of non-meritorious potential plaintiffs. Assuming $\mu$ is large enough (ensured by condition (3)), this loss will be greater than the loss from making the zero offer, $\int_{\bar{A}}^{\tilde{A}} (A + C_D) g(A) dA$. Hence, a zero offer must be made in equilibrium.

Third, we show that a zero offer cannot be the only offer. If the defendant always makes a zero offer, then, only cases with types $A \geq \hat{A} \equiv \frac{C_P + f_M + (C_P + f_M - x)\gamma}{\gamma}$ will be filed. Attorneys

\textsuperscript{12}In other words, in Cases 2 and 3, the first term stated in Definition 2 is an empty set. See Section 2.2.3 in Appendix A.

\textsuperscript{13}Conditions (2) and (3) ensure that a zero offer is made in equilibrium. Condition (4) ensures the existence and uniqueness of the equilibrium positive settlement offer $S$ and the equilibrium mass of low-merit and no-merit cases that are filed $\nu$. 

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with non-meritorious plaintiffs \((A = 0)\) and attorneys with plaintiffs of type \(A \in (0, \hat{A})\) will not be willing to file lawsuits, as they expect negative expected payoffs. But then a zero offer will not be an equilibrium offer. The defendant can offer \(\hat{A} + \epsilon\) and save litigation costs \(C_D\) when facing a plaintiff of a type \(\hat{A} \leq A \leq \hat{A} + \epsilon\). If \(\epsilon < C_D\), the defendant’s expected litigation loss will be \(\int_{\hat{A}}^{A + \epsilon} (\hat{A} + \epsilon) g(A) dA < \int_{\hat{A}}^{A + \epsilon} (A + C_D) g(A) dA\). Hence, there must be at least one positive offer \(S\) in the set of equilibrium offers.

### 3.2 Potential Composition of the Equilibrium Mass of Filed Cases

First, we demonstrate that there must be no-merit cases \((A = 0)\) or low-merit cases \((0 < A < \hat{A})\) that are filed. Otherwise, a zero offer will not be an equilibrium offer.\(^{14}\)

Second, we show that an attorney with a low-merit or no-merit client is willing to file a lawsuit. Low-merit and no-merit plaintiffs always accept an out-of-court settlement offer because their cases cannot proceed to trial. A positive probability of getting a positive expected offer \(E(S)\) ensures a non-negative net payoff for the attorney with a low-merit or no-merit client:

\[
\gamma \left[ b \cdot 0 + (1 - b) E(S) \right] - f_M \geq 0,
\]

where \((1 - b)\) is the probability of getting a positive expected offer.

Third, we demonstrate that high-merit cases \((A \geq \hat{A})\) are always filed. For a high-merit case, the attorney’s expected payoff at the filing stage is \((1 - b)\gamma E(S) + b[\gamma A - C_P - (C_P + f_M - x)r] - f_M\). The last expression is non-negative for \(A = \hat{A}\) and strictly positive for \(A > \hat{A}\).

### 3.3 Equilibrium \(S\) and \(\nu\)

Next, we show that the equilibrium positive settlement offer \(S\) and the equilibrium mass of no-merit and low-merit cases that are filed \(\nu\) exist and are unique.

We have demonstrated that attorneys with high-merit cases will always file lawsuits, and some attorneys with low-merit or no-merit cases will also file lawsuits. We have also established that there are at least two offers, a zero offer and some \(S \geq \hat{A}\). This implies that the positive offer \(S\) must minimize the expected loss of the defendant, and the defendant must be indifferent between offering zero and \(S\). The indifference condition is given by

\[
\nu S + \int_{\hat{A}}^{S} S g(A) dA + \int_{S}^{\hat{A}} (A + C_D) g(A) dA = \int_{\hat{A}}^{\hat{A}} (A + C_D) g(A) dA.
\]

The left-hand and right-hand sides of equation (5) represent the defendant’s expected losses from making an offer \(S > 0\) and a zero offer, respectively. Then, the necessary condition for

\(^{14}\)See the proof of Proposition 1 in Appendix A for details.
local optimality of $S$ is
\[
\frac{\partial}{\partial S} \left[ \nu S + \int_0^S Sg(A)dA + \int_{A}^{\tilde{A}} (A + C_D) g(A)dA \right] = 0.
\]
This last equation simplifies to
\[
\nu + G(S) - G(\tilde{A}) = C_D g(S).
\] (6)

Equation (6) indicates the marginal cost of raising $S$ (represented by the mass of plaintiffs who accept $S$; left-hand side of the equation) equals the marginal benefit of raising $S$ (represented by the savings in litigation cost $C_D$ as fewer cases go to trial; right-hand side of the equation).

Assume that $\bar{A}$ is large enough (so that $\bar{A} > S$) and that the second-order optimality condition $g(A) > C_D \frac{\partial g(A)}{\partial A}$ is satisfied for all $A \in [\tilde{A}, \bar{A}]$ (which is ensured by condition (4)). Lemma 1 in Appendix A demonstrates that the system of equations (5)–(6) has a unique solution, $S$ and $\nu$.

### 3.4 Composition of Equilibrium $\nu$

The prevalent magnitude of the lawyers’ financial constraints $\tilde{A}$ (the state of the world) determines one of three mutually-exclusive scenarios: $G(\tilde{A}) - \nu > 0$, $G(\tilde{A}) - \nu = 0$, and $G(\tilde{A}) - \nu < 0$. We call these three scenarios, Case 1, Case 2, and Case 3, respectively. Lemma 2 in Appendix A shows that a relaxation of the lawyers’ financial constraints (i.e., a reduction in $\tilde{A}$) lowers $G(\tilde{A}) - \nu$. Then, Cases 1, 2, and 3 occur under “Strong,” “Medium” and “Mild” lawyers’ financial constraints, respectively.

Cases 1, 2, and 3 involve different compositions of equilibrium $\nu$, and hence, different compositions of the equilibrium mass of filed cases $\zeta$. Next, we show how the composition of $\nu$ determines the equilibrium probability that the defendant makes a zero offer $\beta$.

In Case 1, the total mass of low-merit cases $G(\tilde{A})$ is greater than the equilibrium mass of low- and no-merit cases that are filed $\nu$. Given that $f_F > f_M$, the equilibrium $\nu$ must be composed by some low-merit cases only. Hence, the equilibrium mass of filed cases $\zeta$ includes some low-merit cases, in addition to all high-merit cases. In this environment, an attorney with an average low-merit client mixes between filing and not filing.$^{15}$ Then, he must be indifferent between these two strategies.

\[
f_M = \gamma(\beta \cdot 0 + (1 - \beta)S).
\]

$^{15}$In principle, the probability of filing for a low-merit plaintiff may depend on the specific $A$. Then, the expression “average “low-merit client” is used here.
Intuitively, although low-merit cases cannot proceed to trial, they might still receive a positive out-of-court settlement offer due to asymmetric information. The indifference condition allows us to compute \( \beta \), the probability that a defendant makes a zero offer.

\[
\beta = 1 - \frac{f_M}{\gamma S}. \tag{7}
\]

An attorney with a no-merit client never files a lawsuit because his expected payoff is negative.

\[
\gamma[\beta \cdot 0 + (1 - \beta)S] - f_F = \gamma\left[\left(1 - \frac{f_M}{\gamma S}\right)0 + \frac{f_M}{\gamma S}S\right] - f_F = f_M - f_F < 0.
\]

Intuitively, although asymmetry of information might allow the no-merit plaintiff to receive a positive settlement offer, the probability of getting this offer \((1 - \beta)\) is too low to cover the lawyer’s costs of filing a non-meritorious case \(f_F > f_M\).

In Case 2, the total mass of low-merit cases \(G(\tilde{A})\) is equal to the equilibrium mass of low- and no-merit cases that are filed \(\nu\). Then equilibrium \(\nu\) must be composed by all low-merit cases. Hence, the equilibrium mass of filed cases \(\zeta\) includes all low-merit cases, in addition to all high-merit cases. In this environment, an attorney with a low-merit plaintiff must receive a strictly positive expected payoff but an attorney with a no-merit offer must receive a negative expected payoff. Hence, the following condition must hold

\[
f_F > \gamma[\beta \cdot 0 + (1 - \beta)S] > f_M.
\]

This condition yields a range of values \(\beta \in \left(1 - \frac{f_M}{\gamma S}, 1 - \frac{f_F}{\gamma S}\right)\).

In Case 3, the total mass of low-merit cases \(G(\tilde{A})\) is lower than the equilibrium mass of low- and no-merit cases that are filed \(\nu\). Then equilibrium \(\nu\) must be composed by all low-merit cases and some no-merit case. Hence, the equilibrium mass of filed cases \(\zeta\) includes all low-merit and some no-merit cases, in addition to all high-merit cases. In this environment, the expected payoff for an attorney with a low-merit client must be strictly positive.

\[
\gamma[\beta \cdot 0 + (1 - \beta)S] - f_M = \gamma\left[\left(1 - \frac{f_F}{\gamma S}\right)0 + \frac{f_F}{\gamma S}S\right] - f_M = f_F - f_M > 0.
\]

An attorney with a no-merit case will mix between filing and not filing. Hence, he must be indifferent between these two strategies. The indifference condition

\[
\gamma[\beta \cdot 0 + (1 - \beta)S] - f_F = 0
\]

allows us to compute \(\beta\).

\[
\beta = 1 - \frac{f_F}{\gamma S}. \tag{8}
\]
3.5 Equilibrium $\lambda$

The equilibrium strategies of the average plaintiff and his attorney and the equilibrium mass of filed cases determine the beliefs of the defendant.\footnote{Appendix A presents detailed analysis of the construction of the defendant’s beliefs.}

The defendant’s optimal probability of an accident is

$$\lambda_D = \arg \min \{ K(\lambda) + \lambda l_D \}, \quad (9)$$

where

$$l_D = \int_{\tilde{A}}^{\bar{A}} (A + C_D) g(A) dA. \quad (10)$$

represents the defendant’s litigation loss. By Lemma 3 in Appendix A, for any positive value of $l_D$, the function $K(\lambda) + \lambda l_D$ has a unique interior minimum $\lambda_D \in (0, 1)$.

Proposition 1 characterizes the equilibrium of the game.

**PROPOSITION 1.** Assume that conditions (2)–(4) hold. The following strategy profile, together with the defendant’s beliefs, characterize the perfect Bayesian equilibrium of the game.

**Case 1:** $G(\tilde{A}) - \nu > 0$

1. The defendant chooses a probability of accident $\lambda_D = \arg \min \left\{ K(\lambda) + \lambda \int_{\tilde{A}}^{\bar{A}} (A + C_D) g(A) dA \right\}$. If a lawsuit is filed, the defendant mixes between proposing a zero offer with probability $\beta = 1 - \frac{f_M}{\nu S}$ and proposing an offer $S > 0$ with the complementary probability.
2. A high-merit case is always filed by the plaintiff’s attorney; an average low-merit case is filed with probability $\nu G(\tilde{A})$; a no-merit case is never filed.
3. A high-merit plaintiff always rejects a zero offer and accepts an offer $S > 0$ only if $A \leq S$; a low-merit plaintiff always accepts a non-negative offer; a no-merit plaintiff always accepts a non-negative offer.
4. The defendant’s equilibrium beliefs are as follows. When the defendant observes a lawsuit, he believes that $P(A = 0) = 0$, $P(0 < A < \tilde{A}) = \frac{\nu}{\nu + 1 - G(\tilde{A})}$, $P(\tilde{A} \leq A \leq y) = \frac{G(y) - G(\tilde{A})}{\nu + 1 - G(\tilde{A})}$ for any $y \in [\tilde{A}, \bar{A}]$.

**Case 2:** $G(\tilde{A}) - \nu = 0$

1. The defendant chooses a probability of accident $\lambda_D = \arg \min \left\{ K(\lambda) + \lambda \int_{\tilde{A}}^{\bar{A}} (A + C_D) g(A) dA \right\}$. If a lawsuit is filed, the defendant mixes between proposing a zero offer with probability $\beta \in (1 - \frac{f_F}{\nu S}, 1 - \frac{f_M}{\nu S})$ and proposing an offer $S > 0$ with the complementary probability.
(2) A high-merit case is always filed by the plaintiff’s attorney; a low-merit case is always filed; a no-merit case is never filed.

(3) A high-merit plaintiff always rejects a zero offer and accepts an offer $S > 0$ only if $A \leq S$; a low-merit plaintiff always accepts a non-negative offer; a no-merit plaintiff always accepts a non-negative offer.

(4) The defendant’s equilibrium beliefs are as follows. When the defendant observes a lawsuit, he believes that $P(A = 0) = 0$, $P(0 < A \leq y) = G(y)$ for any $y \in (0, \bar{A}]$.

**Case 3:** $G(\bar{A}) - \nu < 0$

(1) The defendant chooses a probability of accident $\lambda_D = \arg \min \{K(\lambda) + \lambda \int_{\bar{A}}^\infty (A+C_D)g(A)dA\}$. If the plaintiff files a lawsuit, the defendant mixes between proposing a zero offer with probability $\beta = 1 - \frac{F_S}{\gamma S}$ and proposing an offer $S > 0$ with the complementary probability.

(2) A high-merit case is always filed by the plaintiff’s attorney; a low-merit case is always filed; a no-merit case is filed with probability $\frac{\nu - G(\bar{A})}{\mu}$.

(3) A high-merit plaintiff always rejects a zero offer and accepts an offer $S > 0$ only if $A \leq S$; a low-merit plaintiff always accepts a non-negative offer; a no-merit plaintiff always accepts a non-negative offer.

(4) The defendant’s equilibrium beliefs are as follows. When the defendant observes a lawsuit, he believes that $P(A = 0) = \frac{\nu - G(\bar{A})}{\nu + 1 - G(\bar{A})}$, $P(0 < A \leq y) = \frac{G(y)}{\nu + 1 - G(\bar{A})}$ for any $y \in (0, \bar{A}]$.

Table 1 summarizes the equilibrium outcomes and payoffs. See Section 2.2 in Appendix A for details. For exposition, the rest of the paper will be focused on Case 1. The formal analysis of Cases 2 and 3 is presented in Appendix A.

## 4 Comparative Statics: Cost-Reducing Policy

This section studies the effects of a cost-reducing policy on the equilibrium outcomes and payoffs. Consider, for instance, a policy aimed at reducing the lawyer’s financial cost of loans $r$. It is simple to show that a reduction in $r$ lowers $\bar{A} = \frac{C_P + (C_F + f_M - x)r}{\gamma}$.\(^{17}\)

\(^{17}\)More generally, a decrease in $\bar{A}$ might be also generated by a reduction in the plaintiff’s litigation costs $C_P$, a reduction in the filing cost $f_M$, an increase in the lawyer’s share of the plaintiff’s gross recovery $\gamma$, or an increase in the lawyer’s own funds $x$. 

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Table 1: Equilibrium Outcomes and Payoffs

<table>
<thead>
<tr>
<th>Probability of Accident</th>
<th>$\lambda_D = \arg \min \left{ K(\lambda) + \lambda \int_{\tilde{A}}^A (A + C_D) g(A) dA \right}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass of Filed Cases</td>
<td>$\zeta = \int_{\tilde{A}}^A g(A) dA + \nu$</td>
</tr>
<tr>
<td>Probability of a Zero Offer$^a$</td>
<td>$\beta = (1 - \frac{f_M}{\gamma S}), \beta \in (1 - \frac{f_M}{\gamma S}, 1 - \frac{f_F}{\gamma S})$, $\beta = (1 - \frac{f_F}{\gamma S})$</td>
</tr>
<tr>
<td>Probability of Trial</td>
<td>$\rho = \beta[1 - G(\tilde{A})] + (1 - \beta)[1 - G(S)]$</td>
</tr>
<tr>
<td>Defendant’s Expected Litigation Loss</td>
<td>$l_D = \int_{\tilde{A}}^A (A + C_D) g(A) dA$</td>
</tr>
</tbody>
</table>

Plaintiff’s Expected Payoff

- No-Merit ($A = 0$)$^b$ | $\Pi_P = (1 - \gamma)[\beta \bullet 0 + (1 - \beta)S]$ |
- Low-Merit ($0 < A < \tilde{A}$) | $\Pi_P = (1 - \gamma)[\beta \bullet 0 + (1 - \beta)S]$ |
- High-Merit with $A \in [\tilde{A}, S)$ | $\Pi_P = (1 - \gamma)[\beta A + (1 - \beta)S]$ |
- High-Merit with $A \in [S, \tilde{A}]$ | $\Pi_P = (1 - \gamma)A$

Attorney’s Expected Payoff

- No-Merit ($A = 0$)$^b$ | $\Pi_{PA} = \gamma[\beta \bullet 0 + (1 - \beta)S] - f_F$ |
- Low-Merit ($0 < A < \tilde{A}$) | $\Pi_{PA} = \gamma[\beta \bullet 0 + (1 - \beta)S] - f_M$ |
- High-Merit with $A \in [\tilde{A}, S)$ | $\Pi_{PA} = \gamma[\beta A + (1 - \beta)S] - \beta[C_P + (C_P + f_M - x)r] - f_M$ |
- High-Merit with $A \in [S, \tilde{A}]$ | $\Pi_{PA} = \gamma A - [C_P + (C_P + f_M - x)r] - f_M$

Notes: The mass of filed cases is conditional on accident occurrence, and the other outcomes are conditional on accident occurrence and filing; $\Pi_A$ and $\Pi_{PA}$ denote the expected payoff for the plaintiff and his attorney, respectively; $^a$probability of a zero offer for Cases 1, 2, and 3, respectively; $^b$applies to Case 3 only.

4.1 Effects on the Equilibrium Outcomes

Proposition 2 summarizes the comparative statics results of a reduction in $\tilde{A}$. Our analysis is focused on Case 1. The formal proofs are presented in Appendix A.

**PROPOSITION 2.** A reduction in $\tilde{A}$: (1) increases the expected litigation loss of the defendant $l_D$; (2) reduces the probability of an accident $\lambda_D$; (3) reduces the (strictly) positive out-of-court settlement offer $S$; (4) reduces the probability of a zero offer $\beta$; (5) increases the mass of filed cases $\zeta$; and (6) increases the probability of trial $\rho$ if $C_D < \tilde{A}$.18

Intuitively, a relaxation of the lawyer’s financial constraint (i.e., a reduction in $\tilde{A}$), increases access to justice for true victims by inducing more cases with low $A$ to be filed and less low-

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18Intuitively, if the defendant’s litigation costs are low enough, then a reduction in $\tilde{A}$ increases the probability of trial. This is a sufficient (but not necessary) condition. See the proof in Appendix A for details.
merit cases to be dropped (by reducing the likelihood of a zero offer associated with dropping of low-merit cases).\textsuperscript{19} Given the asymmetry of information between the plaintiff and the defendant, the higher likelihood of confronting plaintiffs with low \( A \) induces the defendant to lower the positive settlement offer, and hence, increases the likelihood of trial and the litigation costs. As a consequence of the negative impact of the higher likelihoods of filing and trial (and higher litigation costs), which are not offset by the positive effect of the lower settlement offer, the defendant’s expected loss increases and hence, his expenses on care also increase. This latter effect reduces the likelihood of accident occurrence. These results also hold in Case 3 and across cases.\textsuperscript{20}

4.2 Effects on the Plaintiff’s and Attorney’s Payoffs

The effects of a cost-reducing policy on the average expected payoffs for the plaintiff and his attorney are generally ambiguous.\textsuperscript{21} They depend on the value of \( A \) relative to the old and new thresholds and the old and new equilibrium positive offers.

Let \( \tilde{A}' < \tilde{A} \) and \( S' < S \) denote the new threshold and the new equilibrium offer, respectively. Table 2 summarizes the five cases studied. For each case, the first and second column refer to the old and new position of \( A \), respectively. Appendix A presents the discussion of all cases.

4.2.1 Effects on the Plaintiff’s Payoff

Our discussion will be focused on the cases in which the plaintiff’s expected payoff is affected by a cost-reducing policy. Some initially low-merit plaintiffs are better off. Specifically, in the second case (\( 0 < A < \tilde{A} \) and \( A > \tilde{A}' \)), the plaintiff can now proceed to trial and get a strictly positive payoff. Before the policy, the case was dropped (a zero offer was accepted). However, some high-merit plaintiffs are worse off. In the third case (\( \tilde{A} < A < S \) and \( \tilde{A}' < A < S' \)), the positive effect of an increase in the probability of a strictly positive offer less than offsets the negative effect of a reduction in the strictly positive offer. As a result, the plaintiff’s expected

\textsuperscript{19}Given that a reduction in \( \tilde{A} \) lowers the settlement offer \( S > 0 \), and given the inverse relationship between a settlement offer \( S > 0 \) and the probability of making that offer \( (1 - \beta) \), the probability of making a zero offer \( \beta \) will decrease.

\textsuperscript{20}The analysis also applies to Case 3 and across cases because the algebraic expressions for the equilibrium outcomes are similar across cases. Result (6) may be violated if a shift between cases occurs. This violation becomes immaterial when \( f_M \) is infinitely close to \( f_F \) because \( \beta_1 \) will converge to \( \beta_3 \). Case 2 is a borderline case. Any change in \( \tilde{A} \) will shift the equilibrium from Case 2 to Case 1 or to Case 3.

\textsuperscript{21}Average expected payoffs are presented in Section 3.2.1 in Appendix A.
### Table 2: Effects of a Cost-Reducing Policy on Plaintiff’s and Attorney’s Payoffs

<table>
<thead>
<tr>
<th>Plaintiff’s Type Position</th>
<th>Payoff Effect</th>
<th>Before Policy</th>
<th>After Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Πₚ</td>
<td>Πₚₐ</td>
<td>0 &lt; A &lt; A'</td>
</tr>
<tr>
<td>0 &lt; A &lt; A'</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>A &gt; A'</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>A &lt; A' &lt; S</td>
<td>−</td>
<td>+/−/0</td>
<td></td>
</tr>
<tr>
<td>S &lt; A &lt; S'</td>
<td>−</td>
<td>+/−/0</td>
<td></td>
</tr>
<tr>
<td>A &gt; S'</td>
<td>0</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

### Notes: Πₚ and Πₚₐ denote the expected payoff for the plaintiff and his attorney; +, −, and 0 denote positive change, negative change, and no effect, respectively.

payoff is reduced. Similarly, in the fourth case (\( \bar{A} < A < S \) and \( A > S' \)), the plaintiff is worse off. He now proceeds to trial with certainty and gets an award equal to \( A \). Then, a generous expected payoff (due to a settlement offer greater than \( A \)) is now replaced with a lower payoff.

#### 4.2.2 Effects on the Attorney’s Payoff

The attorney’s expected payoff depends directly on \( C_p, f_m, \) and \( r \), which also affect \( \bar{A} \). Then, only an evaluation of the effects of individual factors can be implemented. Consider the effect of a reduction in the lawyer’s financial cost \( r \). Our discussion will be focused on the cases in which the attorney is unequivocally better off.

Our analysis suggests that only in the second and fifth cases, the attorney is unequivocally better off. Consider the second case (\( 0 < A < \bar{A} \) and \( A > \bar{A}' \)). The initially low-merit case can now proceed to trial. Then, a zero offer is replaced with a strictly positive offer. This effect is aligned with the effect of a cost-reducing policy on the plaintiff’s payoff. Consider now the fifth case (\( A > S \) and \( A > S' \)). The high-merit case proceeds to trial, before and after the reduction in \( r \). Due to the reduction in the financial cost \( r \), the attorney’s expected payoff increases.

Summing up, only when a cost-reducing policy allows the initially low-merit plaintiffs to proceed to trial (second case), both the plaintiff and his attorney are unequivocally better off. In this case, access to justice for true victims is also enhanced.
5 Welfare Analysis: Cost-Reducing Policy

This section presents the welfare analysis of a cost-reducing policy for Case 1. The main qualitative findings also hold for Case 3. This analysis is presented in Appendix A (Section 2.2.3).

5.1 Definitions

Formal definitions of the social welfare components follow.

Consider the “No-Access to Justice” component \( \eta \) in Case 1. Given Definition 2,

\[
\eta = \left[ \int_0^{\tilde{A}} g(A)dA - \nu \right] + \nu \beta. \quad (11)
\]

Intuitively, \( \eta \) represents the inability of true victims to access to justice. It takes into account (1) the mass of low-merit potential plaintiffs who cannot file a lawsuit, \( \int_0^{\tilde{A}} g(A)dA - \nu \); and, (2) the mass of low-merit plaintiffs who file a lawsuit but receive a zero offer, and hence, need to drop their cases, \( \nu \beta \).

Let \( \theta \) be the coefficient of conversion of the “No Access to Justice” term, \( \eta \), into social welfare loss.

**DEFINITION 3.** The social loss from litigation \( l_W \) is defined as follows.

\[
l_W = H + \zeta \bullet f_M + \rho \bullet (C_P + C_D) + \theta \eta = \\
= H + \left[ \int_{\tilde{A}}^{\hat{A}} g(A)dA + \nu \right] f_M + \left[ \beta \int_{\tilde{A}}^{\hat{A}} g(A)dA + (1 - \beta) \int_{s}^{\hat{A}} g(A)dA \right] (C_P + C_D) + \\
+ \theta \left[ \int_0^{\tilde{A}} g(A)dA - \nu + \nu \beta \right]. \quad (12)
\]

The social loss from litigation \( l_W \) encompasses four main components: (1) average expected social harm from an accident \( H \), which is greater than or equal to the average expected private harm from an accident \( \int_0^{\hat{A}} g(A)dA \); (2) total filing cost \( f_M \); (4) total legal costs incurred in case of trial \( (C_P + C_D) \); and, (4) cost associated with the inability of true victims to access to justice, “No Access to Justice” term \( \eta \).

---

22 Case 2 is a borderline case. Any change in \( \tilde{A} \) will shift the equilibrium from Case 2 to Case 1 or to Case 3.

23 Remember that \( \int_0^{\tilde{A}} g(A)dA - \nu = 1 - \zeta = 1 - \left[ \int_0^{\hat{A}} g(A)dA + \nu \right] \), where \( \zeta \) is the mass of filed cases.

24 \( H \) is strictly greater than the average expected private harm from an accident when the accident has caused additional harm to other individuals, firms, or society as a whole.
DEFINITION 4. The social welfare loss function \( SWL \), evaluated at \( \lambda_D \), is defined as follows.

\[
SWL(\lambda_D) = K(\lambda_D) + \lambda_D l_W = \\
= K(\lambda_D) + \lambda_D \left\{ H + \left[ \int_{A} g(A)dA + \nu \right] f_M + \left[ \beta \int_{A} g(A)dA + (1 - \beta) \int_{S} g(A)dA \right] (C_P + C_D) + \\
+ \theta \left[ \int_{0}^{A} g(A)dA - \nu + \nu \beta \right] \right\}.
\]

(13)

The social welfare loss function, evaluated at the privately-optimal probability of an accident \( \lambda_D \), encompasses two main components: (1) Resources devoted to accident prevention \( K(\lambda_D) \); (2) (unconditional) social loss from litigation \( \lambda_D l_W \).

Let \( \lambda_W = \arg \min \{ K(\lambda) + \lambda l_W \} \) represent the socially-optimal probability of an accident.

DEFINITION 5. The potential injurer’s deterrence level is defined as follows.

(1) Under-Deterred Potential Injurer: \( \lambda_D > \lambda_W \).

(2) Over-Deterred Potential Injurer: \( \lambda_D < \lambda_W \).

By Lemma 3 in Appendix A, \( l_D < l_W \) implies under-deterrence, and \( l_D > l_W \) implies over-deterrence.

5.2 Social Welfare Analysis

We analyze the social welfare effect of a cost-reducing policy (i.e., the effect of a reduction in \( \tilde{A} \)). We demonstrate that the overall effect of a cost-reducing policy is generally ambiguous. If the positive effect on access to justice for true victims is weak and the potential injurers are overdeterred, then this policy is welfare reducing.

We start our analysis by decomposing the overall welfare effect into two components, indirect and direct effects. The indirect and direct effects capture the impact of a cost-reducing policy on the potential injurer’s care-taking incentives, and on the social welfare loss from litigation, respectively. Then, the indirect and direct effects are computed for a given \( l_W \) and a given \( \lambda_D \), respectively.

Mathematically, the overall welfare effect of a reduction in \( \tilde{A} \) is given by

\[
\frac{dSWL(\lambda_D)}{d\tilde{A}} = \frac{\partial SWL(\lambda_D)}{\partial \lambda_D} \frac{\partial \lambda_D}{\partial \tilde{A}} + \frac{\partial SWL(\lambda_D)}{\partial \tilde{A}}.
\]
The first term in the right-hand side of the equation represents the indirect effect while the second term represents the direct effect.

The direct effect can be computed by explicit differentiation:

\[
\frac{\partial SWL(\lambda_D)}{\partial \tilde{A}} = -\lambda_D \frac{(\tilde{A} + C_D)G(\tilde{A})}{S} f_M + \lambda_D (C_P + C_D) \frac{\partial \rho}{\partial \tilde{A}} + \lambda_D \theta \left( \frac{\partial \eta}{\partial \tilde{A}} \right).
\] (14)

To compute the indirect effect, we take into account that at the point of the defendant’s optimum, \(\lambda_D\), the first-order optimality condition implies:

\[
\frac{\partial K(\lambda_D)}{\partial \lambda_D} = -l_D.
\]

Differentiating the first-order optimality condition with respect to \(\tilde{A}\) yields:

\[
\frac{\partial \lambda_D}{\partial \tilde{A}} = -\frac{\partial \tilde{A}}{\partial \lambda_D} = \frac{(\tilde{A} + C_D)G(\tilde{A})}{\frac{\partial^2 K(\lambda_D)}{\partial \lambda_D^2}}.
\]

Then, the indirect effect can be written as:

\[
\frac{\partial SWL(\lambda_D) \partial \lambda_D}{\partial \tilde{A}} = \left[ \frac{\partial K(\lambda_D)}{\partial \lambda_D} + l_W \right] \frac{(\tilde{A} + C_D)G(\tilde{A})}{\frac{\partial^2 K(\lambda_D)}{\partial \lambda_D^2}} = (l_W - l_D)^2 \frac{(\tilde{A} + C_D)G(\tilde{A})}{\frac{\partial^2 K(\lambda_D)}{\partial \lambda_D^2}}.
\] (15)

Hence, the overall welfare effect of a cost-reducing policy can be expressed as

\[
\frac{dSWL(\lambda_D)}{d\tilde{A}} = \left[ (l_W - l_D)^2 \frac{(\tilde{A} + C_D)G(\tilde{A})}{\frac{\partial^2 K(\lambda_D)}{\partial \lambda_D^2}} \right] + \left[ - \lambda_D \frac{(\tilde{A} + C_D)G(\tilde{A})}{S} f_M + \lambda_D (C_P + C_D) \frac{\partial \rho}{\partial \tilde{A}} + \lambda_D \theta \left( \frac{\partial \eta}{\partial \tilde{A}} \right) \right].
\] (16)

The first and second terms in brackets represent the indirect and direct effects of a cost-reducing policy, respectively. A detailed analysis of these two effects follows.

**Indirect Welfare Effect**

The indirect effect, \(\left[ (l_W - l_D)^2 \frac{(\tilde{A} + C_D)G(\tilde{A})}{\frac{\partial^2 K(\lambda_D)}{\partial \lambda_D^2}} \right]\), is generally ambiguous. It depends on the sign of the term \((l_W - l_D)\), i.e., on the relationship between the social loss from litigation and the defendant’s private litigation loss. Intuitively, the indirect welfare effect depends on the potential injurer’s deterrence level. The welfare effect will be positive if the potential injurer is under-detereed \(l_W > l_D\),\(^{25}\) otherwise, it will be negative.

\(^{25}\)In this case, a reduction in \(\tilde{A}\) will reduce the social welfare loss, and hence, will increase social welfare.
More specifically, the social loss from litigation $l_W$ is given by equation (12), and the defendant’s private expected loss from litigation $l_D$ is given by equation (10). Then, the term $(l_W - l_D)$ can be expressed as follows.

$$l_W - l_D = \left[ H - \int_\bar{A} A g(A) dA \right] +
\left\{ (C_P + C_D) \left[ \beta \int_\bar{A} g(A) dA + (1 - \beta) \int_S g(A) dA \right] - C_D \int_\bar{A} g(A) dA \right\} +
\left\{ \left[ \int_\bar{A} g(A) dA + \nu \right] f_M + \theta \left[ \int_0^\bar{A} g(A) dA - \nu + \nu \beta \right] \right\}.$$  

The first term in brackets is likely to be positive because the average expected social harm from an accident $H$ is expected to be greater than or equal to the average expected private harm from an accident $\int_0^\bar{A} g(A) dA$. The third term in curly brackets is also positive.\(^{26}\) The second term in curly brackets will be positive if $f_M$ is sufficiently lower than $\gamma S$.\(^{27}\) In this case, the sign of the term $(l_W - l_D)$ will be unambiguously positive, and hence, the indirect effect of a cost-reducing policy will be welfare enhancing. Otherwise, the indirect effect might be welfare reducing.

**Direct Welfare Effect**

The direct effect of a cost-reducing policy on social welfare, \(- \lambda_D (\bar{A} + C_D) G(\bar{A}) f_M + \lambda_D (C_P + C_D) \frac{\partial \rho}{\partial \bar{A}} + \lambda_D \theta (\frac{\partial \eta}{\partial \bar{A}})\), is also ambiguous. It depends on the sign of the expression in brackets. Specifically, the direct effect includes two negative welfare effects, the effect of larger filing costs (first term in $f_M$), and the effect of larger litigation costs (second term in $C_P + C_D$; $\frac{\partial \rho}{\partial \bar{A}} < 0$, by Proposition 2). It also includes a positive welfare effect (third term in $\theta$; $\frac{\partial \eta}{\partial \bar{A}} > 0$, by Lemma 4 in Appendix A). This positive effect will offset the negative effects if the value of $\theta$ (the coefficient of conversion of the No-Access to Justice term $\eta$ into social welfare loss) is large enough. In this case, the sign of the expression in brackets will be positive, and hence, the direct effect of a cost-shifting policy will be welfare improving. Otherwise, the indirect effect will be welfare reducing.

\(^{26}\)Note that $\eta = \int_0^\bar{A} g(A) dA - \nu + \nu \beta$, which is positive.

\(^{27}\)If $f_M < \gamma S$, then $\beta = 1 - \frac{f_M}{\gamma S}$ will be quite close to unity. Then, $\rho = \beta \int_\bar{A} g(A) dA + (1 - \beta) \int_S g(A) dA$ should be sufficiently close to $\int_\bar{A} g(A) dA$. Hence, adding $C_P$ to $C_D$ ensures that the second term will be positive.
Overall Welfare Effect

Proposition 3 summarizes the main welfare results.

Define $\theta$ as

$$\theta = \frac{\lambda_D (A + C_D) G(\tilde{A}) f_M - \lambda_D (C_P + C_D)}{\lambda_D \frac{\partial \rho}{\partial \tilde{A}}}.$$  \hspace{1cm} (18)

**PROPOSITION 3.** If the defendant is under-deterred ($l_W > l_D$) and $\theta > \theta$, then the welfare effect of a cost-shifting policy is positive; if the defendant is over-deterred ($l_W < l_D$) and $\theta < \theta$, then the welfare effect of a cost-shifting policy is negative. \(^{28}\)

Our analysis demonstrates that cost-reducing policies might be welfare reducing, and underscores the importance of the potential injurer’s deterrence level and the No-Access to Justice component.

### 6 Extension: A Cost-Shifting Model

We extend our benchmark model to study the welfare effects of a policy that allows attorneys to shift part of the litigation and filing costs to their clients.

In the benchmark model, the attorney calculates his fee from the client’s *gross recovery*, and then deducts expenses out of his own share. In the cost-shifting model, the attorney calculates his fee from the client’s *net recovery*. Hence, the attorney effectively shifts a $(1 - \gamma)$ portion of the case-related expenses to the plaintiff.

We assume that the plaintiff’s litigation costs $C_P = C^1_P + C^2_P$, where $C^1_P$ represents case-related litigation expenses that can be shifted to the client. \(^{29}\) We also assume that the filing cost $f_M$ can be shifted to the client. We denote $\tilde{A}''$ as the merit level at which proceeding and not proceeding to trial provide the same expected payoff for the lawyer, $\gamma (\tilde{A}'' - C^1_P - f_M) - C^2_P - (C_P + f_M) r = -f_M$. Hence, $\tilde{A}''$ represents the lawyer’s financial constraint.

**DEFINITION 6.** The lawyer’s financial constraint $\tilde{A}''$ is defined as follows.

$$\tilde{A}'' = C^1_P + f_M + \frac{C^2_P + (C_P + f_M - x)r - f_M}{\gamma}.$$ \hspace{1cm} (19)

\(^{28}\)A sufficiently large (small) value of $\theta$ does not necessarily mean that $\theta$ should be large (small) in absolute sense. It can be just relatively large (small) compared to $(C_P + C_D)$ and $f_M$, and still satisfy the condition stated in Proposition 3. For instance, if $(C_P + C_D)$ and $f_M$ become small (large) enough, then $\theta$ becomes smaller (larger). As a result, the inequalities described in Proposition 3 will be satisfied for lower (higher) values of $\theta$.

\(^{29}\)In the benchmark model, $C^1_P = 0$, and $C_P = C^2_P$. 

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Finally, we assume that the lawyer’s financial constraint is common knowledge. In particular, the plaintiff knows that the attorney’s financial constraint allows only high-merit cases ($A \geq \tilde{A}''$) to proceed to trial. It is straightforward to verify that $\tilde{A}'' < \tilde{A}$, where $\tilde{A}$ corresponds to the threshold value of $A$ under the benchmark model. In other words, a cost-shifting policy reduces the threshold $\tilde{A}$, i.e., relaxes the lawyer’s financial constraint. The structure of the equilibrium and comparative statics resemble the benchmark model. The formal analysis is presented in Appendix B (Lemmas 6–7, Propositions 4–5, and proofs).

The rest of the section will be focused on the social welfare analysis for Case 1. We assess the effects of a cost-shifting policy on social welfare by comparing the social welfare loss functions associated with the cost-shifting model and the benchmark model.

Let the terms with and without superscript (”) correspond to the equilibrium outcomes for the cost-shifting and the benchmark models, respectively. Let $\Delta = (SWL'' - SWL)$ represent the total welfare effect of a cost-shifting policy. A positive welfare effect will be indicated by $\Delta < 0$. The total welfare effect $\Delta$ can be decomposed into direct and indirect effects.

$$\Delta = \{[K(\lambda_D'' + \lambda_D''l_W'') - [K(\lambda_D) + \lambda_Dl_W'']] + \{[K(\lambda_D) + \lambda_Dl_W''] - [K(\lambda_D) + \lambda_Dl_W'\} =$$

$$= \{[K(\lambda_D'' + \lambda_D''l_W') - [K(\lambda_D) + \lambda_Dl_W'']] + \lambda_D(l_W'' - l_W) \}.$$ (20)

The first expression in curly brackets, $\{[K(\lambda_D'') + \lambda_D''l_W''] - [K(\lambda_D) + \lambda_Dl_W'']\}$, represents the indirect effect, which operates through changes in the potential injurer’s care-taking incentives. The second expression in curly brackets, $\{\lambda_D(l_W'' - l_W)\}$, represents the direct effect, which operates through changes in the social loss from litigation. A detailed analysis of these two effects follows.

**Indirect Welfare Effect**

The indirect effect of a cost-shifting policy on social welfare, $\{[K(\lambda_D'') + \lambda_D''l_W''] - [K(\lambda_D) + \lambda_Dl_W'']\}$, is generally ambiguous. It depends on the sign of the expression in curly brackets. Intuitively, the indirect welfare effect depends on the potential injurer’s deterrence level.

By Proposition 5 in Appendix B, $\lambda_D'' < \lambda_D$. Given the assumptions about the function $K(\lambda)$, it is straightforward to show that $K(\lambda) + \lambda l_W''$ is decreasing on the interval $(0, \lambda_W'')$ and increasing on the interval $(\lambda_W'', 1)$. Then, the sign of the expression in curly brackets will be

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In particular, a cost-shifting policy increases the probability of trial and the mass of filed cases. In addition, this policy increases the expected loss of the defendant, and hence, reduces the probability of an accident.
negative when $\lambda''_D > \lambda''_W$, and hence, the indirect effect will be welfare improving. Otherwise, it will be welfare reducing.

The intuition is as follows. Consider first the case where the defendant was initially underdeterred and is still underdeterred under the cost-shifting policy ($\lambda''_D > \lambda''_W$). The defendant’s expected litigation loss conditional on accident occurrence $l''_D$ is lower than the socially optimal litigation loss $l''_W$. Although the higher private expected litigation loss under the cost-shifting policy forces the potential defendant to increase his spending on care, his level of care is not above the socially optimal. Hence, the indirect effect is welfare improving. Second, consider the case where the defendant was initially overdeterred. Then, he will be also overdeterred under the cost-shifting policy ($\lambda''_D < \lambda''_W$). Too many resources were initially spent on care, and the situation is aggravated by the cost-shifting policy. Hence, the indirect effect of a cost-shifting policy is welfare reducing.

**Direct Welfare Effect**

The direct effect of the cost-shifting policy on social welfare, $\lambda_D(l''_W - l_W)$, is also ambiguous. It depends on the sign of the term $(l''_W - l_W)$. This term can be expressed as

$$l''_W - l_W = [H + \zeta'' \cdot f_M + \rho'' \cdot (C_P + C_D) + \theta\eta''] - [H + \zeta \cdot f_M + \rho \cdot (C_P + C_D) + \theta\eta] = (\zeta'' - \zeta)f_M + (\rho'' - \rho)(C_P + C_D) + \theta(\eta'' - \eta).$$

Equation (21) indicates that a cost-shifting policy affects $(l''_W - l_W)$ in three ways. There are two negative welfare effects that operate through the larger filing cost (due to higher number of true victims filing a lawsuit) and the larger litigation costs (due to the higher conditional probability of trial). A third welfare effect operates through the change in the No-Access to Justice term $\eta$.

The effect of a cost-shifting policy on the No-Access to Justice term $\eta$ is generally ambiguous. On the one hand, $\eta$ will be lower because of the higher filing and the higher share of true victims that can now proceed to trial (higher share of plaintiffs with $A \geq \tilde{A}''$). On the other hand, $\eta$ might be higher or lower due to the change in the probability of a zero offer $\beta$, which is generally ambiguous (by Proposition 5 in Appendix B). The following sufficient condition ensures that a cost-shifting policy decreases $\beta$, and hence, decreases $\eta$.

$$-\gamma(S'' - S) > (1 - \gamma)f_M.$$  

As a result, a cost-shifting policy will unambiguously reduce $\eta$. Hence, access to justice for true victims will be enhanced.
If the effect on the No-Access to Justice term $\eta$ offsets the effects on filing and litigation costs, then the sign of the term $l''_W - l_W$ will be negative, and hence, the direct effect of a cost-shifting policy will be welfare enhancing. Otherwise, it will be welfare reducing.

**Overall Welfare Effect**

If the direct welfare effect of a cost-shifting policy is positive and the defendant is under-det deterred, then a cost-shifting policy will be welfare improving. If the positive effect on access to justice is weak and the defendant is overdeterred, then this policy will reduce social welfare. Our analysis suggests that cost-shifting policies should be used with caution.

**7 Summary and Conclusions**

We provide the first theoretical analysis of legal disputes in a framework characterized by financially-constrained lawyers, third-party funding, and asymmetric information. To the best of our knowledge, our article is also the first to formally study the effects of public policies associated with legal disputes on access to justice by true victims.

We demonstrate that the lawyers’ financial constraints permeate every decision made by the parties involves in a legal dispute. We show that the prevalent magnitude of the lawyers’ financial constraints (the state of the world) determines the composition of the equilibrium mass of cases that are filed. In equilibrium, bargaining impasse occurs and access to justice is denied to some true victims. We present a formal analysis of two empirically-relevant policies: Cost-reducing and cost-shifting policies. We show that these policies might be welfare reducing if their positive effects on access to justice are weak and the potential injurers are overdeterred.

Our paper provides important policy implications. First, our work points to the significance of lawyers’ financial constraints for the analysis of legal disputes. Second, our analysis underscores the importance of the care-taking and filing for the assessment of the welfare effects of public policies. In particular, we show that access to justice by true victims and deterrence are determinant factors of the overall social welfare effects of policies that relax lawyers’ financial constraints. Importantly, our results inform current debate regarding the extension of cost-shifting policies by allowing lawyers to shift the financial costs of loans to their clients. Proponents of this reform have focused on the effects on access to justice. Our results suggest that a comprehensive assessment of these policies should also consider the effects on care-taking incentives for potential injurers.

In future work, we plan to extend our benchmark model to study the design of contracts.
between the lawyer and the third-party lender. In particular, the new framework will include
the third-party lender as a fourth player and uncertainty about the likelihood of succeeding at
trial. This environment will allow us to evaluate the effects of recourse and non-recourse loans,
and the effects of uncertainty about the likelihood of succeeding at trial on access to justice
for true victims, bargaining impasse, and care-taking incentives. These, and other extensions,
remain fruitful areas for future research.
References


