The Effect of Third-Party Funding of Plaintiffs on Settlement

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A significant policy concern about the emerging plaintiff legal funding industry is that loans will undermine settlement. When the plaintiff has private information about damages, we find that the optimal (plaintiff-funder) loan induces all plaintiff types to make the same demand, resulting in full settlement; implementation may entail a very high repayment amount. Plaintiffs' attorneys with contingent-fee compensation benefit from such financing, as it eliminates trial costs. When the defendant has private information about his likelihood of being found liable, we find that the likelihood of settlement is unaffected. In both settings the defendant's incentive for care-taking is unaffected. (JEL ***C7, D8, K4****)*

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Since the late twentieth century the financing of lawsuits, wherein third parties provide direct financial support to tort plaintiffs, has developed into an emerging industry in the U.S. (and worldwide[1]) with a potentially-substantial effect on the efficiency of the legal system. Such financial support takes the form of a "non-recourse" loan; that is, the litigation funder advances payment to the plaintiff, and repayment occurs only if the plaintiff is successful (either in settlement or at trial), and then only up to the plaintiff's recovery (net of attorney fees, which are generally a percentage of the plaintiff's received transfer from the defendant). Focusing on the non-recourse aspect, some courts and commentators have bemoaned such loans, arguing that they will necessarily lead to increased failure of settlement negotiations and interference in the attorney-client relationship.[2]

In this paper we use a signaling model to analyze the effect of such third-party loans to plaintiffs on settlement bargaining when a plaintiff has private information about the value of her suit. A loan that must be repaid independent of the success of the borrower's undertaking should have no effect on settlement bargaining between a plaintiff and a defendant. We show that the effect of a non-recourse loan on settlement is substantial, but not as critics fear: an *optimal* loan (i.e., one that maximizes the joint expected payoff to the litigation funder and the plaintiff) induces *full* settlement. This is a remarkable result, inasmuch as settlement bargaining under asymmetric information generally results in some degree of bargaining breakdown, leading to trial. Furthermore, in contrast with

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[1] For discussions of litigation funding outside the U.S., see Hodges, Vogenauer, and Tulibacka (2010), Chen (2012), and Abrams and Chen (forthcoming).

[2] For example, the U.S. Chamber Institute for Legal Reform makes these assertions. More broadly, they contend (2012, p. 1) that "Third-party investments in litigation represent a clear and present danger to impartial and efficient administration of civil justice in the United States."

the standard (no-loan) settlement models, no information is revealed either via bargaining or trial: all plaintiff types (type here is the anticipated trial award) make the same demand and, since no types go to trial, private information is not revealed. Of course, since there are no trials in equilibrium, there is no efficiency loss as trial costs are avoided.

This occurs because an optimal non-recourse loan has the effect of making the plaintiff's expected net recovery from trial *independent of her true type*. In the case of no loan (or a traditional loan that must be repaid), it is variation in the expected recovery from trial that allows a plaintiff to reveal her damages through her settlement demand. A plaintiff with higher damages is willing to make a higher settlement demand and face a higher likelihood of rejection by the defendant because her expected net recovery from trial is also higher. But if her expected net recovery from trial does not vary with her type, then no revelation is possible and pooling is the equilibrium outcome; this will happen with a non-recourse loan if it is structured optimally. It is also essential that the funder buys only the rights to the stream of settlement or trial payments, *not* the control rights. For if the funder purchased the control rights over decisions about settlement, then the bargaining problem would resemble one wherein there is no loan, and costly signaling would occur.

The optimal loan is implemented via a cash advance to the plaintiff and a repayment amount that is sufficient to direct all receipts from settlement or trial to the litigation funder. This entails a very high repayment amount; although this results in "full insurance" for the plaintiff, risk-sharing is not its purpose as she is taken to be risk-neutral; nor does the (possibly high) implied interest rate reflect a risk premium for the litigation funder (as he is also taken to be risk-neutral). Moreover, we find that plaintiffs' attorneys benefit from such financing, as it eliminates the need to take the case to trial due to bargaining breakdown; thus, they do not face the costs of a trial. To the extent that the market for legal services is competitive, this will result in a reduction in attorneys' contingent fees. The resulting additional surplus will be captured by the litigation funding industry (if it is concentrated) or by plaintiffs (if litigation funding is competitive).

Historically in common law countries (at least since the late 13th century), support of litigation by third parties was banned as "maintenance," as it was viewed as encouraging suits that otherwise would not be pursued. Currently (and very recently), most U.S. jurisdictions allow such third-party financing of plaintiffs' cases, so as to enhance access to courts by wealth-constrained plaintiffs. Importantly, while U.S. law generally allows attorneys to use contingent fees[3] (i.e., a percentage of the amount won) for personal injury cases, such equity shares in this context are generally forbidden for third-party funding.

According to Garber (2010) and Molot (2010), there are three primary forms of litigation funding in the US. These are: 1) consumer legal funding, wherein a third party provides a non-recourse loan directly to a plaintiff (the focus of this paper); 2) loans to plaintiffs' law firms, wherein a funder provides an ordinary secured loan to a law firm; and 3) investments in commercial claims, wherein a funder provides an up-front payment in exchange for a share of the eventual recovery.[4] Garber (p. 9-10) summarizes consumer legal funding as follows (where ALF denotes "alternative litigation financing").

> "... ALF companies provide money to consumers (individuals) with pending legal – typically, personal-injury – claims. To be eligible for such funding, it appears that a consumer must have an attorney who has agreed to represent him or her in pursuing the claim. And, since almost all of the underlying lawsuits involve personal-injury claims, it is likely that almost

[3] Attorneys are not allowed to buy plaintiffs' cases, although allowing this has been proposed; see Daughety and Reinganum (2013) for an analysis of this issue.

[4] See Kirstein and Rickman (2004), Deffains and Desrieux (2011), and Hylton (2011).

> all consumers receiving this form of litigation funding are being represented on a contingency-fee basis. ... Crucially for both legal and analytic reasons, these contracts are typically *non-recourse loans*, meaning that consumers are obligated to pay their ALF suppliers the *minimum* of (1) the amount specified in the contract (given the time of payment) and (2) the consumers' proceeds from the underlying lawsuit."

Our formal model is consistent with the description provided by Garber (2010) for consumer legal funding.[5] Relevant players include a plaintiff, a plaintiff's attorney who is being compensated via a contingent fee, a funder offering a non-recourse loan directly to the plaintiff, and a defendant. Our focus is not on access or the credibility of trial following bargaining breakdown (contingent fees already ensure these), but on how such a loan affects the plaintiff's incentive to settle when she has private information about her damages. In our model, the plaintiff may sell the rights to the monetary award but she never relinquishes control over the suit; in particular, she continues to make decisions about settlement bargaining and trial.

There are at least two important reasons why consumer legal funding might be value-creating. While the use of contingent-fee compensation[6] for the plaintiff's attorney provides the plaintiff with access to the legal system, the plaintiff is likely to have immediate and unusual costs such as medical, psychological, and specialized living expenses; financing these via normal loans is

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[5] To our knowledge, Avraham and Wickelgren (2013) is the only other paper that examines consumer legal funding. In their model, the terms of the loan can reveal a funder's private information; they ask whether the funding contract should be admissible as evidence in court. Settlement is not considered.

[6] There is a literature examining how alternative contracts between plaintiffs and their attorneys affect settlement. Bebchuk and Guzman (1996) examine contingent versus hourly fees whereas Choi (2003) and Leshem (2009) consider delegation of settlement authority to the attorney.

likely to be impossible. If the litigation funder has access to capital markets at a lower interest rate than the plaintiff, then the plaintiff and the funder can gain from intertemporal arbitrage. Furthermore, the non-recourse nature of the loan shifts risk from the (arguably more risk-averse) plaintiff to the (arguably less risk-averse) litigation funder. We abstract from these rationales by assuming risk neutrality and equal discount rates in order to focus on the effect of litigation funding on settlement negotiations.

An important conjecture expressed in the legal literature and by some courts is that consumer legal funding may result in fewer settlements.

> "A rational plaintiff will not settle for any amount offered by the defendant that is less than the aggregate of the principal amount advanced to her and the current interest accrued, which is often immense due to the staggering rates charged by many litigation finance companies. This artificially inflated minimum acceptable offer and the nonrecourse character of the arrangement will lead the rational plaintiff to reject otherwise reasonable settlement offers, since, if she loses at trial, she will owe nothing. In this way, litigation finance gives plaintiffs disincentives to settle and instead encourages disputes to progress to trial." Rodak (2006, p. 522).

We will see that, in a signaling model, the hypothesized effect of fewer settlements can occur for some loan contracts, but it does not occur for the equilibrium loan contract (which is jointly optimal for the funder and the plaintiff). The equilibrium loan contract extracts the defendant's full willingness-to-pay and induces *all* suits to settle, whereas only a fraction of suits would settle absent funding.[7] This occurs because the equilibrium non-recourse loan contract induces all plaintiff types to "pool" and demand the average damages (plus the defendant's trial costs), which the defendant accepts. This channel through which consumer legal funding ensures settlement by removing the plaintiff's incentive to "signal"

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[7] We use the equilibrium refinement D1 (Cho and Kreps, 1987). The unique refined equilibrium with no litigation funding is a fully-revealing equilibrium with a positive likelihood of trial.

her type has not been recognized previously, either in the legal or economics literature.[8]

Section I describes the model's assumptions as well as the sequence of actions being taken by the agents. Section II provides the results of the settlement bargaining (signaling) subgame and the determination of the optimal loan contract, for either a monopolized or competitive funding market. Section III briefly discusses an alternative (screening) version of the settlement subgame. Section IV summarizes our results. An Online Appendix[9] provides details of the analysis.

I. Modeling Preliminaries

We model the problem as a two-period (five-stage) game among four agents: the plaintiff (P), the plaintiff's attorney (PA), a litigation funder (LF) who may lend funds to P, and the defendant (D). The actual award at trial, denoted as A, is distributed uniformly[10] on $[\underline{A}, \overline{A}]$, with $\overline{A} > \underline{A} > 0$. There is (initially) symmetric uncertainty among all agents regarding A when P, PA, and LF engage in contracting, but later, during a period of preliminary trial preparation, P and PA (jointly) privately observe the realized value of A prior to settlement bargaining with D. Preliminary trial preparation results in a cost, denoted as c_S; this is a cost

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[8] Aghion and Hermalin (1990) show that *exogenous* restrictions on the form of contracts, which limit or mandate certain terms that – if subject to choice – might reveal private information, can be welfare-enhancing. In our model, the terms of the non-recourse loan contract between the plaintiff and litigation funder are *endogenous*, and the contract does not prohibit costly signaling; rather, it removes the incentive for the plaintiff to engage in costly signaling, thus enhancing welfare.

[9] Available at http://www.vanderbilt.edu/econ/faculty/Daughety/DR-LitFundingTechApp.pdf

[10] We assume that A is distributed uniformly so as to simplify computations in the equilibria that involve pooling. The qualitative properties of the model are robust to more-general distributions.

that *PA* incurs even if settlement occurs (we ignore any settlement costs that *D* experiences, as they do not affect the analysis), and includes the cost of preparing and filing the complaint that (among other things) specifies *P*'s demand for damages. The incremental cost of trial for *PA* (resp., *D*) is denoted c_P (resp., c_D); all costs are common knowledge. The probability that P wins at trial, also common knowledge, is denoted as $\lambda \in (0, 1)$.

The plaintiff first engages an attorney (*PA*) and then she negotiates a loan contract with a litigation funder (*LF*). We follow the general perception that the plaintiff is wealth-constrained, and that her contract with *PA* involves a contingent-fee arrangement wherein *PA* bears the costs c_S and c_P (if there is a trial) and receives an exogenously-given share, denoted as $\alpha \in (0, 1)$, of either the settlement or award at trial. Payment to *PA* takes priority over repaying the loan to *LF*; that is, an award of *A* at trial yields the amount $(1 - \alpha)A$ to *P*, out of which she then makes a loan repayment. *LF* knows this, and *PA*'s share α, when he offers a loan to *P*. The critical aspect of this loan is that it is secured only by the plaintiff's recovery. We assume that *P*'s discount rate for future income and *LF*'s cost of capital are the same, and denoted as *i*, and that this, too, is common knowledge.

More precisely, our game involves the following timing:

Period 1 (which consists of three stages):

1. *P* contracts with *PA* using the (given) contingent-fee rate α. *PA* verifies and documents the fact that the award is distributed uniformly on $[\underline{A}, \overline{A}]$.

2. *P* provides this documentation on the distribution of the award to *LF*. *LF* offers a non-recourse loan (B, z), which gives *P* the amount *B* immediately and specifies a repayment amount of *z* in Period 2. If, after paying *PA*, *P* nets more than *z* in either settlement or at trial, she retains the difference; if not, she pays all of the proceeds to *LF*. If *P* rejects the loan she proceeds with her suit due to the contingent-fee arrangement with *PA*.

3. *PA* expends the preliminary cost c_S, which reflects costs incurred

because of preparation for settlement negotiation as well as filing costs. In the course of preparing the suit, *P* and *PA* jointly learn the true value of *A*;[11] that is, the true value of *A* is now *P*'s private information and is therefore *P*'s type. *PA* files a complaint against *D* and specifies the damages *P* is seeking.

Period 2 (which consists of two stages):

4. Settlement negotiation occurs; before negotiations begin, *D* learns the distribution of the award *A*, as well as the contingent-fee rate α and the loan terms (B, z). If settlement at an amount *S* occurs, then transfers among the parties are as specified by the contracts: 1) *D* transfers *S* to *P*; 2) *P* pays *PA* the contingent fee of αS; and 3) *P* pays *LF* the amount $\min\{z, (1 - \alpha)S\}$.

5. If settlement fails then trial occurs; *PA* incurs c_P and *D* incurs c_D. The court learns *P*'s true type and determines whether *P* has won or lost; *P* wins with probability $\lambda \in (0, 1)$. If *P* wins at trial then: 1) *D* transfers *A* to *P*; 2) *P* pays *PA* the amount αA; and 3) *P* then pays $\min\{z, (1 - \alpha)A\}$ to *LF*. Finally, if *P* loses at trial, then *P* pays zero to *PA* and zero to *LF*.

Notice that in stage 2 the contracting between *P* and *LF* over the loan occurs under conditions of symmetric (imperfect) information; it is not until stage 3 that *P* and *PA* jointly learn *P*'s true type (*A*). One might wonder whether *P* and *LF* are symmetrically uninformed, as assumed. *P* has not yet engaged in case preparation (including, for example, deposing doctors); *LF* has general experience with personal injury torts (from previous funding experiences), but not the case at hand. The most parsimonious assumption is that the distribution of *A* is common knowledge for *P* and *LF*. Garber (2010, p. 25) suggests that "the amount that an ALF supplier in this industry segment would be willing to spend on due diligence for any application is fairly small" and they are more likely to simply rely on the

[11] Preparing to file suit is time-consuming; during this time period, *P* and *PA* inevitably learn more about *P*'s type; for simplicity, we assume that they learn *P*'s true type, *A*, with certainty.

assessment and reputation of the plaintiff's attorney. The model described above is consistent with our understanding that funding is obtained early in the process and that consumer legal funders do not get very involved in the details of the suit.[12]

Since bargaining between *P* and *D* (in stage 4) involves private information, and since the complaint filed by *PA* for *P* in stage 3 includes a specific demand for damages, our model in Section II takes the (one-sided) incomplete information bargaining problem in stage 4 as an ultimatum game wherein the informed *P* moves first by making a demand of amount *S* – via the complaint – and the uninformed *D* chooses to accept or reject the demand. Moreover, since *P* has a contingent-fee contract with *PA*, going to trial generates no direct cost for *P*. Therefore, *P*'s threat to go to trial if *D* rejects her settlement demand is always credible.[13]

II. Settlement Bargaining and Optimal Funding

We first analyze Period 2 and then find the optimal non-recourse loan (B, z). Complete-information expected payoffs (i.e., all agents know *A* but have common imperfect information about the outcome of the trial) for all four agents at the

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12 If *P* had some private information (such as the subinterval of [$\underline{A}$, $\bar{A}$] that her type is in) when contracting with *LF*, then one could front-end our analysis below with a screening offer made by *LF*. The screening offer might reveal *P*'s information, but that would simply mean that *D* would need to update his information for the bargaining game in Period 2, yielding qualitatively similar results.

13 For some contracts with *LF*, *P* nets zero from trial and hence is indifferent between dropping her suit and trial, but *LF* wants *P* to be credibly committed to trial if her demand is rejected. *P* can be strictly incentivized to go to trial following rejection by including a side payment from *LF* to *P* whenever *P* settles or goes to trial, but not when *P* drops the suit following rejection. Since the required side payment is vanishingly small, we ignore it. Moreover, should *P* suffer a small known cost of trial that is not absorbed by *PA*, then the contract with *LF* will also include an agreement that *LF* will compensate *P* for this cost, thus re-establishing a credible threat of trial.

beginning of Period 2 are shown in Table 1.

Table 1: Period 2 Expected Payoffs when A is P's type

	D	PA	P	LF
Settle at S	$- S$	αS	$\max\{0, (1 - \alpha)S - z\}$	$\min\{z, (1 - \alpha)S\}$
Trial	$- (\lambda A + c_D)$	$\alpha\lambda A - c_P$	$\max\{0, \lambda[(1 - \alpha)A - z]\}$	$\min\{\lambda z, \lambda(1 - \alpha)A\}$

Under complete information, the maximum demand that D would accept is $s^C(A) \equiv \lambda A + c_D$. At this demand, a P of type A who makes a positive payoff from both settlement and trial prefers settlement to trial if and only if:

(1) $\quad (1 - \alpha)(\lambda A + c_D) - z \geq \lambda[(1 - \alpha)A - z];$

that is, if and only if $z \leq z^X \equiv (1 - \alpha)c_D/(1 - \lambda)$. Notice that z^X is independent of A, decreasing in α, and increasing in c_D and λ. If the repayment amount z is large enough ($z > z^X$), then even though a P of type A might make a positive return from settlement at the demand $s^C(A)$, she would prefer trial over settlement.

However, as seen in Table 1, P's overall expected return from trial is actually piecewise linear, so the term on the right in inequality (1) is negative for types A such that $(1 - \alpha)A < z$. Let $\underline{z} \equiv (1 - \alpha)\underline{A}$ be the repayment such that the lowest possible type, if successful at trial, just breaks even. Furthermore, let $\overline{z} \equiv (1 - \alpha)\overline{A}$ be the repayment such that the highest possible type, if successful at trial, just breaks even. Using the definition of z^X, then $\underline{z} = z^X$ when $c_D = (1 - \lambda)\underline{A}$ and $\overline{z} = z^X$ when $c_D = (1 - \lambda)\overline{A}$. This induces the following partition of the parameter space: a) $c_D < (1 - \lambda)\underline{A}$; b) $(1 - \lambda)\underline{A} \leq c_D \leq (1 - \lambda)\overline{A}$; and c) $(1 - \lambda)\overline{A} < c_D$.

A. *Results from the Period 2 Analysis of the Signaling Game*

Under complete information, D accepts P's demand of $s^C(A)$ for sure; however, when A is P's private information, then D may mix between accepting and rejecting a given demand S. Thus, the payoff to a P of type A who demands S is $(1 - p(S))\max\{0, (1 - \alpha)S - z\} + p(S)\max\{0, \lambda[(1 - \alpha)A - z]\}$, where $p(S)$ is an arbitrary probability of rejection for D. For any fractional values of λ and α, every point in (c_D, z) space yields multiple equilibria, as is typical for signaling games; we use the refinement D1 (see Cho and Kreps, 1987) to select among these. However, in some portions of the (c_D, z) space there are multiple (refined) equilibria; P is indifferent among these equilibria, but LF is not. When this occurs, we assume that P selects the equilibrium that LF most prefers, and we indicate how P can be strictly incentivized to choose this equilibrium. We discuss this in more detail below.

Figure 1 illustrates how the (c_D, z) space is partitioned by the (refined and selected) equilibria for all three cases that partition the parameter space. Note the dashed line labeled z^X demarcating where P strictly prefers trial to settlement at her complete-information demand, $s^C(A)$. To the left of this line, some or all types of P make demands that force the suit to trial. In the sequel we focus on Case (b) (where $\underline{z} \leq z^X \leq \overline{z}$), as this yields the greatest variety of possible outcomes.

Place Figure 1 about here

For repayment amounts $z < \underline{z}$, all P types prefer settlement at the complete-information demand $s^C(A) = \lambda A + c_D$ to trial and all P types expect a net positive payoff from trial. Since the trial payoff increases with type, it is possible to have a fully-separating equilibrium wherein higher demands are rejected with a higher probability; higher types are willing to make higher demands and risk a higher probability of rejection because their expected trial payoff is higher. Thus, when $z \leq \underline{z}$, the unique (refined) equilibrium is as in Reinganum and Wilde (1986): a P of type A makes her complete-information demand, $s^C(A) = \lambda A + c_D$, and D rejects an arbitrary demand S with probability $p(S; z)$:

$$(2) \qquad p(S; z) = \begin{cases} 0 \text{ for } S < \underline{S} \\ 1 - \exp\{-(S - \underline{S})/w(z)\} \quad \text{for } S \in [\underline{S}, \overline{S}] \\ 1 \text{ for } S > \overline{S}, \end{cases}$$

where $w(z) \equiv c_D(1 - z/z^X)$, $\overline{S} \equiv s^C(A)$, and $\underline{S} \equiv s^C(\underline{A})$. It is straightforward to show that the equilibrium probability of rejection is increasing in S for fixed z and increasing in z for fixed S. Moreover, the lowest equilibrium demand, $\underline{S}$, is never rejected and the highest equilibrium demand, $\overline{S}$, is rejected with positive (but fractional) probability. Here, all types are revealed via their demands. Furthermore, $p(s^C(A); z)$, the equilibrium rejection function for D as a function of P's type, is also increasing in z for fixed A. Thus, loans with small positive repayment amounts do discourage some settlement (as compared with no loan).

PROPOSITION 1: *When $z < \underline{z}$, there is a unique (refined) equilibrium wherein P's demand is fully revealing, D rejects the demand with the probability specified in equation (2), and this probability of rejection is increasing in z so that small positive loans increase the likelihood of trial.*

When $z \geq \underline{z}$, then the right-hand-side of inequality (1) is negative for some P types, so their expected payoffs from trial are zero due to the non-recourse property of the loan; clearly, this occurs for lower values of A. Let $A_0^T(z)$ denote the type that just expects to break even at trial when the repayment amount is z; thus, $A_0^T(z) \equiv$

$z/(1 - \alpha)$, so $A_0^T(\underline{z}) = \underline{A}$ and $A_0^T(\overline{z}) = \overline{A}$. Since all $A \in [\underline{A}, A_0^T(z)]$ have the same expected net trial payoff of zero, P's payoff function does not vary with her type on this interval. There is no reason for the demands of types in this set to differ, so we assume they make the same demand. The pooled demand by these types is $s^P(A_0^T(z)) \equiv \mathrm{E}\{s^C(A) \mid A \in [\underline{A}, A_0^T(z)]\}$; under the uniform distribution, $s^P(A_0^T(z)) = (\lambda(\underline{A} + A_0^T(z))/2) + c_D$. If D believes that the demand $s^P(A_0^T(z))$ is made by all P types in $[\underline{A}, A_0^T(z)]$, then D accepts this demand with probability 1.

On the other hand, P's payoff *does* vary with type for $A \in (A_0^T(z), \overline{A}]$ because these types expect a net positive payoff of $\lambda[(1 - \alpha)A - z]$ at trial; moreover, if $z < z^X$, then these types prefer settlement at $s^C(A)$ to trial. This means that an equilibrium exists wherein types in this upper set reveal A by demanding $s^C(A)$, but they must face a sufficiently high probability of rejection so that members of the pool will not mimic any of these higher (revealing) types. Furthermore, if the limiting probability of rejection as S goes to $s^C(A_0^T(z))$ is less than one, then D's rejection function will be increasing over the interval $(s^C(A_0^T(z)), \overline{S}]$.

There exists a level of repayment, $\hat{z}$, with $\underline{z} \leq \hat{z} < z^X$, where the pooled types of P just net zero from settlement: $\hat{z}$ is the solution to $(1 - \alpha)s^P(A_0^T(z)) - z = 0$. Now all the pooled types net zero at trial *and* in settlement. At this value of z, the jump in D's rejection function just brings the rejection probability for the revealing types to 1. Thus, as we move in Figure 1 up from $z = \underline{z}$, the pool $[\underline{A}, A_0^T(z)]$ increases in measure, the related pooling demand, $s^P(A_0^T(z))$, (which D accepts) increases, the set of revealing types $(A_0^T(z), \overline{A}]$ is shrinking from below, and the rejection function over these types is rising towards 1, converging to 1 just as z converges to $\hat{z}$. There are still some types who reveal themselves by making their complete-information demands, but (in the limit) these demands are rejected with probability one. Specifically, D's equilibrium rejection function for $z \in [\underline{z}, \hat{z})$ is given by:

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(3)\quad p(S; z) = \begin{cases} 0 \quad \text{for } S \leq s^{P}(A_0^T(z)) \\[2ex] 1 \quad \text{for } S \in (s^{P}(A_0^T(z)),\, s^{C}(A_0^T(z))] \\[2ex] 1 - (1 - p_0(z))\exp\{ - (S - s^{C}(A_0^T(z))/w(z)\} \quad \text{for } S \in (s^{C}(A_0^T(z)),\, \overline{S}] \\[2ex] 1 \text{ for } S > \overline{S}, \end{cases}
$$

where the multiplier $1 - p_0(z)$ equals $[(2 - \lambda)/2(1 - \lambda)][(\hat{z} - z)/(z^X - z)]$. The function $(1 - p_0(z))$ converges to 0 as z converges to $\hat{z}$ and converges to 1 as z converges to $\underline{z}$.[14]

PROPOSITION 2: *When $\underline{z} \leq z < \hat{z}$, the unique (refined) equilibrium involves types in $[\underline{A}, A_0^T(z)]$ pooling at $s^P(A_0^T(z))$, while types in $(A_0^T(z), \overline{A}]$ separate and demand $s^C(A)$. D accepts the demand $s^P(A_0^T(z))$ and rejects any other demands with the probability function in equation (3). The multiplier $(1 - p_0(z))$ deters types in the pool from mimicking the higher (revealing) types.*

By construction, when $z \geq \hat{z}$, then types in $[\underline{A}, A_0^T(z)]$ expect a net payoff of zero from both settlement at the pooled demand $s^P(A_0^T(z))$ and from trial, whereas types in $(A_0^T(z), \overline{A}]$ expect a positive net payoff from trial and prefer settlement at $s^C(A)$ to trial. When $z < z^X$, a (limit) hybrid equilibrium obtains wherein the pooled types demand $s^P(A_0^T(z))$ and the higher types make their complete-information

[14] Notice that out-of-equilibrium demands $S \in (s^P(A_0^T(z)),\, s^C(A_0^T(z))]$ are rejected based on the belief that such a demand comes (uniformly) from the set of pooled types rather than from a type in $(A_0^T(z),\, \overline{A}]$.

demands, but now D rejects all demands above $s^P(A_0^T(z))$ with probability 1. When z continues to rise above z^X, this last type of hybrid equilibrium persists, but now it is the high types of P that force trial – by making an extreme demand – rather than trying to settle at their complete-information demands. We refer to this type of hybrid equilibrium as a "two-tiered pooling equilibrium" in Figure 1, as both sub-intervals of the type space are pooling.

In the equilibrium when $\hat{z} \leq z < \overline{z}$, types in $[\underline{A}, A_0^T(z)]$ expect a net payoff of zero from both settlement at $s^P(A_0^T(z))$ and from trial. Alternative (refined) equilibria exist wherein these types settle for less than $s^P(A_0^T(z))$, or provoke trial by demanding more than $s^P(A_0^T(z))$. Although P is indifferent among these equilibria, LF prefers the one in which these types settle at $s^P(A_0^T(z))$. Thus, we augment the contract between LF and P to include the following provision: *If $z \geq \hat{z}$, then P will play according to the equilibrium wherein types in $[\underline{A}, A_0^T(z)]$ demand $s^P(A_0^T(z))$.* Notice that this provision only applies when P nets zero both from trial and settlement at $s^P(A_0^T(z))$; if P has non-trivial preferences then she chooses the demand she most prefers. Thus, P is not hurt by this provision, and it benefits LF; moreover, although PA is not a party to this contract, he also benefits from P's compliance with this provision.[15]

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[15] Call this equilibrium E^*. P can be strictly incentivized to play E^* via a small side payment from LF to P if: (1) P makes any equilibrium demand from E^* that is accepted; or (2) P makes any equilibrium demand from E^* that is rejected but, at trial, is verified to be that type's equilibrium demand from E^*. Now types in $[\underline{A}, A_0^T(z)]$ strictly prefer $s^P(A_0^T(z))$ to any lower pooled demand or to provoking trial (both of these deviations cost her the side payment), while it does not disturb the higher types' preferences over equilibrium demands from E^*. Finally, since every type loses the same amount (the side payment) by deviating to an out-of-equilibrium demand, there is no reason for D to hold different out-of-equilibrium beliefs when this incentive payment is in place. The required incentive payment is vanishingly small, so we will let it go to zero.

PROPOSITION 3: *When $\hat{z} \leq z < z^X$, the selected equilibrium involves types in $[\underline{A}, A_0^T(z)]$ pooling at $s^P(A_0^T(z))$, while types in $(A_0^T(z), \overline{A}]$ separate and demand $s^C(A)$. D accepts the demand $s^P(A_0^T(z))$ and rejects higher demands with probability 1. When $z^X \leq z < \overline{z}$, the selected equilibrium involves types in $[\underline{A}, A_0^T(z)]$ pooling at $s^P(A_0^T(z))$, but now types in $(A_0^T(z), \overline{A}]$ prefer trial to settlement; we assume they all make demands $S > \overline{S}$ so as to force trial.*

As z increases beyond z^X, the pooling set continues to increase in measure until $z = \overline{z}$, where all types pool at $s^P(A_0^T(\overline{z})) = s^P(\overline{A}) = (\lambda(\underline{A} + \overline{A})/2) + c_D$, which is accepted by D. Thus, any repayment amount $z \geq \overline{z}$ induces full settlement. Because $\overline{z} > \hat{z}$, every plaintiff type expects to net zero in the pooled settlement and at trial, so the same provision is included in the contract in order to select this equilibrium: all types settle at the pooling demand $s^P(\overline{A})$, and turn the proceeds over to LF.

PROPOSITION 4: *When $z \geq \overline{z}$, the selected equilibrium involves types in $[\underline{A}, \overline{A}]$ pooling at $(\lambda(\underline{A} + \overline{A})/2) + c_D$, which D accepts.*

B. *Joint P-LF Recovery and Market Determination of the Equilibrium Loan*

Let $\pi^j(z)$, $j = P$, LF, be the Period 2 individual payoffs for P and LF, respectively, as a function of z, as computed in stage 2 wherein P's type is not known by either P or LF. Let the joint payoff $\Pi(z)$ equal $\pi^P(z) + \pi^{LF}(z)$. Note that $\pi^{LF}(0) = 0$, so that $\Pi(0) = \pi^P(0)$ is what P could expect to obtain without LF (that is, P's "no-loan" or "stand-alone" expected value of her suit). The value $\pi^P(0)$ is found by observing that the equilibrium (when $z = 0$) involves a P of type A making her complete-information demand $s^C(A)$ and D rejecting it with probability $p(s^C(A); 0)$. P's Period 2 expected case value with no loan is simply:

(4) $\pi^P(0) = (1 - \alpha)[\lambda(\bar{A} + \underline{A})/2 + c_D] - [(1 - \alpha)c_D/(\bar{A} - \underline{A})]\int p(s^C(A); 0)\mathrm{d}A$,

where the integral is evaluated over $[\underline{A}, \bar{A}]$. As shown in the Online Appendix, the joint recovery $\Pi(z)$ is decreasing in z from 0 to $\hat{z}$, then increases linearly in z between $\hat{z}$ and $\bar{z}$, and then finally remains constant thereafter at $\Pi(\bar{z})$.

PROPOSITION 5: *When $z \geq \bar{z}$, $\Pi(z) = (1 - \alpha)[\lambda(\bar{A} + \underline{A})/2 + c_D]$; that is, P and LF can extract from D the full expected value of the suit plus his court costs.*

It is clear that $\Pi(\bar{z}) > \Pi(0)$. We now construct the optimal loan, which extracts the maximum amount from *D* and shares it between *P* and *LF*. This is implemented by using a high repayment amount ($z \geq \bar{z}$) so that *LF* becomes the recipient of all of the proceeds of settlement or trial in Period 2 and *P* receives a lump sum *B* in Period 1. *B* must satisfy *P*'s participation constraint: $B \geq \pi^P(0)/(1 + i)$. *LF*'s participation constraint requires that $\Pi(\bar{z})/(1 + i) - B \geq 0$.

If *LF* is a monopolist in the market for litigation financing, then *LF* can make a take-it-or-leave-it offer to *P*; that offer is $B^M = \pi^P(0)/(1 + i)$. Alternatively, if there is at least one more litigation funder, all funders are homogeneous in their access to capital markets, and there are no search costs for *P*, then we would expect funders to bid away all of the surplus, so $B^C = \Pi(\bar{z})/(1 + i)$. Since the implied interest rate, r, is given by $(1 + r)B = \bar{z}$, this rate would be $r = [(1 + i)\bar{z} - \pi^P(0)]/\pi^P(0) > i$ if the market is monopolized, and $r = [(1 + i)\bar{z} - \Pi(\bar{z})]/\Pi(\bar{z}) > i$ if the market is competitive. Although the implied interest rate is lower when litigation funding is competitive as compared to monopolized, the implied interest rate always exceeds *LF*'s cost of funds. Furthermore, note that (regardless of the surplus division) the optimal repayment amount is $\bar{z}$.

PROPOSITION 6: *If the litigation funding industry is a monopoly, then the optimal loan (B^M, z^M) equals $(\pi^P(0)/(1 + i), \bar{z})$; P obtains the discounted value of her stand-alone case. If the industry is competitive, then the optimal loan (B^C, z^C)*

equals $(\Pi(\bar{z})/(1 + i), \bar{z})$*; P obtains all the surplus*.

III. Altering the Informational Assumptions: When *D* has Private Information

An alternative information endowment entails D having private information about λ, his likelihood of being found liable at trial. We now consider a model wherein A is common knowledge (and exceeds c_D) while λ is distributed uniformly on [0, 1], and is observed privately by D prior to settlement negotiations.

The analysis of this game is in the Online Appendix. Here we provide a summary of the critical details when P makes a screening demand of D. Since a D of type λ accepts a demand of S if and only if $S \leq \lambda A + c_D$, P's expected payoff can be written as a function of the marginal type that P induces to settle, denoted as λ^m (the settlement demand is $S^m = \lambda^m A + c_D$):

(5) $\max\{0, (1 - \alpha)(\lambda^m A + c_D) - z\}(1 - \lambda^m) + \int \max\{0, \lambda[(1 - \alpha)A - z]\}\mathrm{d}\lambda,$

where the integral is over $[0, \lambda^m]$. The following Lemma characterizes P's optimal marginal type as a function of z.

LEMMA: *For* $z \in [0, (1 - \alpha)(A + c_D))$*, there is a unique optimal marginal type* $\lambda^*(z) \in (0, 1)$*; it is continuous and increasing in z, with a "kink" at* $z = (1 - \alpha)A$*. As z goes to* $(1 - \alpha)(A + c_D)$*,* $\lambda^*(z)$ *goes to 1; for* $z \geq (1 - \alpha)(A + c_D)$*,* $\lambda^*(z)$ *is the entire set [0, 1].*

The optimal marginal type, $\lambda^*(z)$, is strictly increasing in z (until $\lambda^*(z)$ reaches 1); that is, an increase in the size of the repayment results in more trials. This is because P expects to repay $\lambda^*(z)z$ from trial but to repay $z > \lambda^*(z)z$ from a settlement, so she is marginally more willing to go to trial for higher z. The optimal repayment amount z maximizes the combined receipts of P and LF in Period 2, anticipating that P will demand $S^*(z) = \lambda^*(z)A + c_D$. The combined receipts are given by: $(1 - \alpha)(\lambda^*(z)A + c_D)(1 - \lambda^*(z)) + \int\lambda[(1 - \alpha)A]\}\mathrm{d}\lambda$, where the integral is over $[0, \lambda^*(z)]$. The joint payoff depends on z only via the marginal type

$\lambda^*(z)$ and thus it is maximized at $\lambda^*(0)$. Therefore we obtain Proposition 7.

PROPOSITION 7: *In equilibrium, P demands $\lambda^*(0)A + c_D$; trial occurs with probability $\lambda^*(0)$.*

That is, *P* and *LF* cannot use consumer legal funding to extract more from *D*; absent other motivations, *P* and *LF* will not find consumer legal funding beneficial, so in equilibrium there is no funding contract. But if (for instance) *P* discounts the future more than *LF*, they can still benefit from consumer legal funding by giving *P* a cash advance in Period 1, with *LF* receiving all of the proceeds from settlement or trial in Period 2. To implement this outcome, a high repayment amount of $z \geq (1 - \alpha)(A + c_D)$ is used, since *P* is then willing to make the demand associated with the marginal type $\lambda^*(0)$. The analog of the contract provision under signaling is now: *If $z \geq (1 - \alpha)(A + c_D)$, then P will play according to the equilibrium wherein P demands $\lambda^*(0)A + c_D$.*[16] Finally, in this version of the model, optimal plaintiff funding leaves the extent of settlement and *D*'s type-specific payoffs unchanged.

IV. Summary and Implications for the Market for Legal Services

In this article we model plaintiff litigation funding and settlement bargaining, allowing for three active agents: a plaintiff, a defendant, and a litigation funder who makes loans to plaintiffs; a fourth agent (the plaintiff's attorney) also plays a role, but to a lesser extent. Bargaining between the plaintiff and the funder over the loan details is followed by (asymmetric-information) bargaining between the plaintiff and the defendant, where bargaining failure leads to trial. We consider both the scenario wherein the plaintiff has private information about her damages and the scenario wherein the defendant has private information about his likelihood of losing at trial. Both analyses start from the

[16] For such high levels of *z*, *P* is indifferent among all demands, but *LF* can strictly incentivize *P* to choose this one by offering *P* a small side payment if and only if *P* demands $S = \lambda^*(0)A + c_D$.

reality that it is the plaintiff who files suit and specifies damages, and this serves as the first move in the game. The common result in both analyses is that the funding contract that is *ex ante* jointly optimal for the plaintiff and funder involves high repayment amounts[17] and leads to no greater frequency of trial than occurs without funding. The utility of consumer/plaintiff legal funding is enhanced if the plaintiff is more risk averse or impatient than the funder, and the defendant's incentives to take care are unaffected by such funding.

When the plaintiff has private information about damages, then optimal funding results in full settlement, which has significant implications for the market for legal services. The plaintiff's attorney benefits since he does not incur any trial costs (for which he is responsible under contingent-fee compensation). Thus, for any *given* contingent fee, the plaintiff's attorney will be willing to take cases with higher preparation costs, a lower likelihood of winning, or lower stakes, thus further improving plaintiff access to the legal system. Alternatively, if the market for attorneys is competitive then the attorney's expected revenue from the market equilibrium contingent-fee rate should just cover his expected costs, and hence this rate should fall[18] since attorneys with clients with third-party support only incur the cost of settlement. Finally, if the market for funding is monopolized, then the surplus to the plaintiff from a lower contingent fee will accrue to the funder. However, entry into the litigation funding industry will involve funders competing

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[17] High repayments are consistent with observed practice. Molot (2010, p. 94) indicates that "... a plaintiff may end up owing a cash advance firm more than two or three times what he borrowed – sometimes more than he will collect in judgment." Grous (2006) provides the following examples. Plaintiff Rancman received \$6000 with repayment amounts of \$16,800 (resp., \$22,200 and \$27,600) if the case was resolved in 12 (resp., 18 and 24) months. Plaintiff Fausone received \$3000 with repayment amounts of \$6000 (resp., \$9000 plus 18% interest) if the case was resolved within 6 months (resp., after 6 months). Such examples are non-representative as we only learn the details of these contracts when there is an *ex post* dispute between the plaintiff and the funder.

[18] Interestingly, a fall in α requires a higher value of $\overline{z}$, but does not change the implied rate r.

for clients by offering higher cash advances to plaintiffs at lower implied rates of interest, while maintaining efficient settlement through sufficiently high repayment amounts.

A theoretical analysis is needed because essentially no systematic empirical information exists on the developing litigation funding industry.[19] This industry, which has developed over the past fifteen years, is unregulated and under-studied (Garber relied, in part, on confidential interviews); moreover, loans to plaintiffs who settle are almost surely covered by protective orders, making the details (as part of a settlement) confidential. Despite the lack of an empirical basis for evaluating policy alternatives, calls for regulation (or prohibition) have been made by some courts and a number of commentators, in part based on the conjecture that such loans make plaintiffs resistant to settlement. However, the direct implication of our analysis is that any apparent increase in bargaining breakdown would be due to repayment amounts that are too small, not too large. Of course, we also recognize that ours is a stylized model and future alternative models may come to somewhat different conclusions but, as a first modeling approach to this problem, it suggests that these particular concerns and potential responses may be misguided.

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[19] See Garber (2010, p. 3), wherein he bemoans the lack of "systematic empirical information" on the industry. Abrams and Chen (forthcoming) present results based on data from one large firm in Australia that specializes in funding commercial and insolvency cases, not personal torts; theirs is the only study we are aware of that has access to actual, systematically-collected data.

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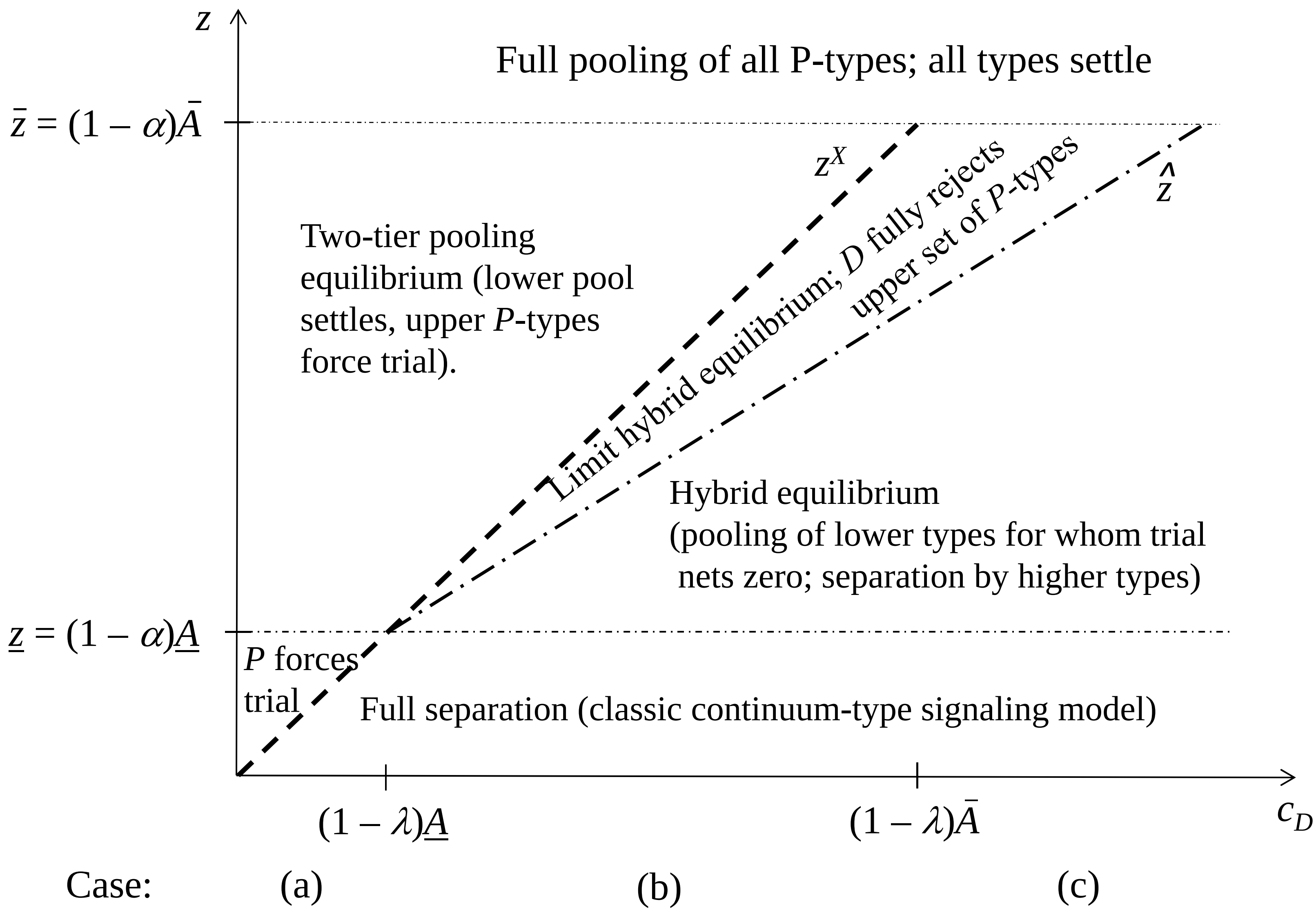

Figure 1: Equilibria in the Settlement Bargaining Subgame