Litigation Funding:
An Economic Analysis

J.B. Heaton[†]

Introduction

Litigation funding—the non-recourse financing of a party's litigation expenses by a third-party funder—is both interesting and controversial. The funds available for litigation funding continue to grow.[1] As an investment product, litigation funding is attractive to investors because the market is young (potentially promising higher returns than available in more mature markets) and because the returns to litigation funding (which pay off when a case is successfully settled or taken to a collected judgment) are highly idiosyncratic and uncorrelated with the returns of major asset classes, providing investors with diversification benefits.[2] The growth of litigation funding has, however, only increased the controversy surrounding it.[3] A Law360 poll of attorneys found that while 88% of attorneys who have used litigation funding report a positive opinion of it, the poll also found that in-house attorneys were less likely than private practice attorneys to report having used third-party funding.[4] The United States Chamber of Commerce remains actively opposed to

[1] *See, e.g.*, Sara Randazzo, *Business News: Litigation Funders Are Awash in Cash —Promise of Sharing in Legal Settlements Lures More Investors; News $500 Million Fund*, WALL ST. J. Sept. 18, 2017, at B3 ("Competing litigation-finance firms have raised and deployed hundreds of millions of dollars in recent months.").

[2] J.B. Heaton, *Analyzing the Economics of Litigation Funding*, LAW360 (May 29, 2018, 2:45 PM EDT), https://www.law360.com/articles/1047771/analyzing-the-economics-of-litigation-funding.

[3] *Id.*

[4] Cristina Violante, *What Your Colleagues Think of Litigation Finance*, LAW360, 1-2 (Dec. 11, 2017, 9:45 PM EST), https://www.law360.com/articles/989204/what-your-colleagues-think-of-litigation-finance.

litigation funding, as evidenced by state legislative efforts to force plaintiffs to disclose their litigation funding arrangements as part of initial discovery disclosures in a case.[5] Some judges, including Judge Polster, who oversees the National Prescription Opiate Multi-District Litigation in the United States District Court for the Northern District of Ohio, require plaintiffs to disclose their litigation funding arrangements to the court, though not to opposing parties.[6]

Although much legal scholarship analyzes aspects of the litigation funding phenomenon,[7] economic analysis of litigation funding is less

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[5] *See* Andrew Strickler, *Wisconsin Governor Signs Legal Funder Transparency Rule*, LAW360 (Apr. 3, 2018, 9:26 PM EDT), https://www.law360.com/articles/1029480/wis-gov-signs-legal-funder-transparency-rule (discussing the new Wisconsin state requiring disclosure of third-party litigation funding).

[6] *See, e.g.*, Jeff Overley, *Opioid MDL Attys Must Disclose Outside Funding, Judge Says*, LAW360 (May 7, 2018, 8:56 PM EDT), https://www.law360.com/articles/1041305/opioid-mdl-attys-must-disclose-outside-funding-judge-says.

[7] The amount of literature on this subject is already large. *See generally* Michael Abramowicz & Omer Alper, *Screening Legal Claims Based on Third-Party Litigation Finance Agreements and Other Signals of Quality*, 66 VAND. L. REV. 1641, 1645 (2013) (analyzing third-party litigation finance and proposing the idea of screening legal claims on ex ante review of the quality of the lawsuit); David S. Abrams & Daniel L. Chen, *A Market for Justice: A First Empirical Look at Third Party Litigation Funding*, 15 U. PA. J. BUS. L. 1075 (2013) (focusing on an Australian litigation-funding firm to answer the question of whether a market for justice could "spur innovation, increase settlement rates, and avoid taint"); Elizabeth C. Burch, *Financiers as Monitors in Aggregate Litigation*, 87 N.Y.U. L. REV. 1273 (2012) (explaining how third-party financing litigation can reduce agency costs); J. Maria Glover, *A Regulatory Theory of Legal Claims*, 70 VAND. L. REV. 221, 231-39 (2017) (discussing the individualistic versus collectivist debate regarding class actions); Radek Goral, *Justice Dealers: The Ecosystem of American Litigation Finance*, 21 STAN. J. L., BUS. & FIN. 98 (2015) (arguing that financial interests by undisclosed third parties should be recognized as legitimate and regulated); Radek Goral, *Skin in the Game: Why Business Lawsuits Get Third-Party Funded*, 30 NOTRE DAME J. L. ETHICS & PUB. POLICY 247 (2016) (arguing that clear rules need to be required for third-party funded litigation); Jasminka Kalajdzic et al., *Justice for Profit: A Comparative Analysis of Australian, Canadian and U.S. Third Party Litigation Funding*, 61 AM. J. COMP. L. 93, 100-06 (2013) (discussing third party litigation funding in Australia and Canada); Julia H. McLaughlin, *Litigation Funding: Charting a Legal and Ethical Course*, 31 VT. L. REV. 615, 618-28 (2007) (exploring the legal and ethical challenges that come along with litigation loan agreements); Jonathan T. Molot, *Litigation Finance: A Market Solution to a Procedural Problem*, 99 GEO. L. J. 65 (2010) (comparing traditional merit based resolutions with the market based approach); Joanna M. Shepherd & Judd E. Stone II, *Economic Conundrums in Search of a Solution: The Functions of Third-Party Litigation Finance*, 47 ARIZ. ST. L. J. 919 (2015) (discussing the positives and negatives of third party investments in commercial litigation for business plaintiffs and law

advanced.[8] We often think of the litigation funding arrangement as solving two problems. First, litigation funding is most obviously a form of financing.[9] Like a contingency fee arrangement, the litigation funding arrangement provides financing that may allow a budget-constrained plaintiff to finance litigation that she would otherwise be unable to pursue. It may also allow a plaintiff that is not budget-constrained to finance the litigation without tapping other available cash, using that case for other purposes. Second, litigation funding is a risk-transfer mechanism.[10] The non-recourse nature of most litigation funding allows the litigant to protect the downside of a loss by trading to the funder more

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firms); Charles Silver, *Litigation Funding Versus Liability Insurance: What's the Difference?*, 63 DEPAUL L. REV. 617 (2014) (comparing liability insurance and third-party litigation funding between plaintiffs and third-party litigation financiers); Maya Steinitz, *How Much Is That Lawsuit in the Window? Pricing Legal Claims*, 66 VAND. L. REV. 1889 (2013) (comparing third-party litigation funding and venture capital to propose models for funding contracts); Maya Steinitz, *The Litigation Finance Contract*, 54 WM. & MARY L. REV. 455 (2012) (analyzing the "commercial funding" aspect of third-party litigation funding in business disputes with high stakes); Maya Steinitz, *Whose Claim Is This Anyway? Third-Party Litigation Funding*, 95 MINN. L. REV. 1268 (2011) (analyzing why third-party litigation funding is needed to "reduce systematic inequalities in our legal system by altering the bargaining positions of individual, class, and sovereign plaintiffs and corporate defendants in a way that will increase the equality of arms in any given litigation and make it more likely that more kinds of litigants will be able to play for rules"); Courtney R. Barksdale, Note, *All That Glitters Isn't Gold: Analyzing the Costs and Benefits of Litigation Finance*, 26 REV. LITIG. 707 (2007) (discussing the lending process alternatives that could balance the costs associated with loans from third-party litigation funders and the benefits of these loans); Matthew Bogdan, Note, *The Decisionmaking Process of Funders, Attorneys, and Claimholders*, 103 GEO. L. J. 197 (2014) (examining contingency fees on behalf of attorneys for clients and third-party litigation funding); Jason Lyon, Comment, *Revolution in Progress: Third-Party Funding of American Litigation*, 58 UCLA L. REV. 571 (2010) (arguing that third party finance should be allowed but regulated).

[8] In addition to economic insights that appear in the articles cited *supra* note 7, for other economic analyses see generally Bruno Deffains & Claudine Desrieux, *To Litigate or Not to Litigate? The Impacts of Third-Party Financing on Litigation*, INT'L REV. L. & ECON. Aug. 2015, 178 (analyzing three forms of financing litigation, including third-party litigation, from an economic viewpoint); Jeremy Kidd, *Modeling the Likely Effects of Litigation Financing*, 47 LOY. U. CHI. L.J. 1239 (2016) (analyzing economic arguments of third-party litigation).

[9] Thomas T. Janover, *Litigation Funding: An Increasingly Popular Investment Vehicle*, LEXOLOGY (Nov. 1, 2018), https://www.lexology.com/library/detail.aspx?g= 3d4474b1-6ce6-4f3e-a853-45b21d47182d (discussing the benefits of litigation funding for financiers).

[10] *Id.*

of the gains from a win. There is also a third, less-emphasized aspect to litigation funding: the opportunity for plaintiffs and funders to make financing arrangements that reflect different beliefs about the probability of success.[11] Plaintiffs and funders can see a case the same way (by having "identically-calibrated probabilistic beliefs"), be pessimistic or be optimistic relative to one another. Different beliefs, like the need for financing or risk transfer, also create incentives for litigation funding.[12]

This Article explores litigation funding in the tradition of the seminal models of economic analysis of litigation developed in the 1970s by Professors Gould, Landes, and Posner.[13] Several insights emerge starting first from analysis of risk-neutral plaintiffs and funders. First, risk-neutral plaintiffs who agree with their potential litigation funder about the probability of plaintiff victory and who are not budget-constrained will not use litigation funding.[14] Second, when the litigation funding contract is linear (that is, it pays the funder a linear multiple greater than one of its investment), risk-neutral plaintiffs who agree with their potential litigation funder on the probability of litigation and who *are* budget-constrained only accept the funding they need to clear their budget constraint for a positive expected value case.[15] Third, negative expected value cases do not get funded when risk-neutral plaintiffs agree with their potential litigation funder on the probability of litigation.[16] Nothing much

[11] Matthew Bodgan, Note, *The Decisionmaking Process of Funders, Attorneys, and Claimholders*, 103 GEO. C. J. 197, 212-13 (2014).

[12] Jeremy Kidd, *To Fund or Not to Fund: The Need for Second Best Solutions to the Litigation Finance Dilemma,* 8 J. L., ECON. & POL'Y 613, 360 (2012) (discussing the incentives third-party financiers have to invest in path manipulation in order to obtain long-term benefits).

[13] *See generally* John P. Gould, *The Economics of Legal Conflicts,* 2 J. LEGAL STUD. 279 (1973) (discussing the economics behind risk and lawsuits); William M. Landes, *An Economic Analysis of the Courts,* 14 J. LAW & ECON. 101 (1971) (discussing variables relevant to settlement and trials); Richard A. Posner, *An Economic Approach to Legal Procedure and Judicial Administration,* 2 J. LEGAL STUD. 399 (1973) (applying a cost analysis to legal dispute resolution).

[14] David S. Abrams & Daniel L. Chen, *A Market for Justice: A First Empirical Look at Third Party Litigation Funding,* 15 U. PENN. J. BUS. L. 1075, 1077 (2013) (showing that a risk-neutral plaintiff would pursue a case if the suit value exceeds the cost of the suit).

[15] *Id.*

[16] *Id*.

changes when the risk-neutral plaintiff is optimistic relative to the funder—that is, when she believes the probability of victory is higher than the funder believes.

Things get more interesting when risk-neutral plaintiffs are pessimistic relative to funders. A risk-neutral, pessimistic plaintiff that is not budget-constrained still will not accept any funding she will be offered for a case she perceives to be a positive expected value. Cases that the risk-neutral, pessimistic plaintiff believes to be a negative expected value are different. A pessimistic, risk-neutral plaintiff that is not budget-constrained and who perceives her case to be a negative expected value may receive and accept full or partial funding for that case if the funder is sufficiently optimistic relative to the plaintiff. Thus, the availability of litigation funding may expand the litigation of (plaintiff-subjectively-perceived) negative expected value cases when optimistic funders meet pessimistic plaintiffs.[17] Of course, it is important to note (as is well known in the law and economics literature) that cases the plaintiff perceives to be of a negative expected value may still be meritorious in the sense of having high probability of victory, if the negative expected value derives from high litigation costs.[18] The expansion of litigation with optimistic funders may fund some truly bad cases, to be sure, but may also fund good cases that (perhaps excessively) pessimistic plaintiffs found too expensive to justify.[19]

To analyze risk-averse plaintiffs, I borrow from common practices in financial derivatives pricing and employ the concept of a change of measure to "risk-neutral probabilities" to show how risk aversion makes a plaintiff act as a risk-neutral plaintiff would act if facing a probability of victory less than the actual subjective probability she holds.[20] This

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[17] *See, e.g.*, Jason Lyon, Comment, *Revolution in Progress: Third-Party Funding of American Litigation*, 58 UCLA L. REV. 571, 590-92 (2010) (discussing the potential effects private litigation funding might have on risky or costly claims).

[18] *See, e.g.*, Kidd, *supra* note 8, at 1249-50 (stating a case based on a valid claim may still have a negative expected value if the costs associated with the suit are high).

[19] *See* Deffains & Desrieux, *supra* note 8, at 180 (stating the absence of such funding is often "a barrier to victory for the plaintiff").

[20] The concept is widely used in the pricing of financial derivatives. *See, e.g.*, John Hull & Alan White, *Credit Derivatives, in* HANDBOOK OF THE ECONOMICS OF FINANCE SET 1363, 1364-65 (G.M. Constantinides et al. eds., 2013) (claiming that "risk-neutral" or "implied" are the default probabilities). I first use this concept in the eco-

allows us to adapt the risk-neutral results to the risk-averse analysis quite easily.[21]   In the cases where risk-averse plaintiffs and funders share probabilistic beliefs about a plaintiff victory, risk aversion is observationally equivalent to plaintiff pessimism. Like a pessimistic, risk-neutral plaintiff, a risk-averse plaintiff who has the same probabilistic belief of victory as her funder may receive and accept funding that she would not have accepted if risk-neutral. And a plaintiff that is optimistic relative to her funder may be sufficiently risk-averse that she too acts "as if" she is pessimistic and accepts funding even when she is not budget-constrained.

Thus, an interesting feature of litigation funding is that it will allow some risk-averse plaintiffs to act more like they would act if they were risk-neutral.[22] This is important from a policy perspective because it allows those plaintiffs to pursue meritorious (in their view) cases they would otherwise forego simply because of their risk aversion. Although litigation funding may expand the litigation of some negative expected value cases, it may also provide a significant benefit, even for plaintiffs that are not budget-constrained, by allowing those plaintiffs to pursue meritorious litigation that defendants might otherwise escape or settle on terms that do not reflect case merits.[23] That is, a benefit of litigation funding is that it moves such cases closer to their risk-neutral outcomes, and therefore arguably closer to their merits.[24] It may allow pursuit of some good cases that would be avoided as if they were bad cases only because of risk aversion, a characteristic of the plaintiff unrelated to merits.[25]

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nomic analysis of litigation in J.B. Heaton, *Risk Aversion as Risk-Neutral Pessimism: A Simple Proof*, 56 INT'L REV. L. & ECON. 70, 70 (Avery W. Kara et al., eds. 2018) ("The proof makes application of a change of measure to risk-neutral probabilities, importing to the economic analysis of litigation a way of conceptualizing risk aversion that is used often in the financial-economic study of derivatives pricing.").

[21] *See* Heaton, *supra* note 20, at 72 ("[T]he observational equivalence of risk aversion to risk-neutral pessimism may provide a useful framework for proving results in the study of several areas of interest . . . .").

[22] *Id.* at 71.

[23] *See id.* (claiming that risk aversion can allow risk-neutral litigants to escape meritorious litigation).

[24] *Id.*

[25] *Id.*

The results presented here suggest that funders (and investors placing money with funders) should be especially cautious of investments to fund litigants who are not budget-constrained and who are not plausibly risk-averse for the amounts at stake in the investment.[26] The results suggest that the best funding outcomes are likely when plaintiffs are plausibly risk-averse or have good reasons to act "as if" they are,[27] or where plaintiffs are budget-constrained. It may be a while, of course, before data on litigation funding outcomes is available to test these predictions.

This Article continues as follows. Part I presents the basic modeling set up, an application of well-known tools of economic analysis of litigation to the litigation-funding problem. Part II presents results for risk-neutral plaintiffs, including the use of a change of measure to risk-neutral probabilities. Part III presents results for risk-averse plaintiffs.

I. Basic Set-Up

I analyze litigation funding within the framework of the seminal economic models of the litigation process.[28] A Law360 poll reported that over 63% of respondents who said they used litigation funding did so for single cases rather than a portfolio of cases or a mix of single cases and portfolios.[29] As such, single cases are the focus of this Article. We let J be the size of judgment awarded to the plaintiff if she wins her case. We assume no uncertainty about J.[30] We assume that the "true" probabil-

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[26] J.B. Heaton, *Settlement Pressure*, 25 INT'L REV. L. & ECON. 264, 268 (2005).

[27] *Id*.

[28] *See* sources cited *supra* note 13. Of course, the economic analysis of litigation has moved into much more complex methodologies than applied here. For more complex methodologies, see Bruce Hay & Kathryn Spier, *Litigation and Settlement*, HARV. L. SCH. JOHN M. OLIN CTR. L., ECON. & BUS. DISCUSSION PAPER SERIES 3 (1997); Kathryn E. Spier, *Litigation*, *in* THE HANDBOOK OF LAW AND ECONOMICS (A. Mitchell Polinsky & Steven M. Shavell eds. 2005); Kathryn Spier, *Litigation, Economics of*, *in* THE NEW PALGRAVE DICTIONARY OF ECONONICS (Dalgrave Macmillan ed., 2008). Nevertheless, the original framework remains useful, especially in unraveling the "basics" of a given litigation situation or procedural device.

[29] *See* Violante, *supra* note 4, at 6.

[30] This is a very strong simplifying assumption. In practice and in theory, the estimation of damages is a large and important part of litigation. *See, e.g.*, Louis Kaplow & Steven Shavell, *Accuracy in the Assessment of Damages*, 39 J. L. & ECON. 191, 191 (1996) (explaining the effects of damage assessment on both private and

ity that the plaintiff wins her case is unknown and concern ourselves only with the subjective probabilities held by the plaintiff, the funder, and the defendant. The plaintiff believes the probability of winning is P_p, the litigation funder believes the probability of plaintiff victory is P_f, and the defendant believes the probability of plaintiff victory is P_d.[31]

A person is "optimistic" relative to another if they believe in a higher probability of plaintiff victory and "pessimistic" if they believe in a lower probability of plaintiff victory, regardless whether we are dealing with the beliefs of the plaintiff, the funder, or the defendant.[32] This is the natural use of the words "optimistic" and "pessimistic" for the plaintiff and the funder, and those are the only parties we use these terms with below. I use the term "identically-calibrated" to refer to those who have identical subjective probabilities of victory, so that plaintiff and funder are identically-calibrated if $P_p = P_f$. When a person is optimistic or pessimistic relative to another person, they are "differently-calibrated."

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societal incentives). However, it is also the case that litigants often share considerable information before the start of litigation and, by rule and otherwise, early in the case. This too can justify assumptions (to some extent) of common knowledge about case merits, including damages at issue. *See, e.g.*, Steven Shavell, *Sharing of Information Prior to Settlement or Litigation*, 20 RAND J. ECON. 183, 184-85 (1989) (discussing that the magnitude and likelihood of a judgment is often shared in settlement negotiations).

[31] These probabilities of victory include all relevant probabilistic judgments, including the probability of legal error that benefits or costs one side or the other. *See, e.g.*, A. Mitchell Polinsky & Steven Shavell, *Legal Error, Litigation, and the Incentive to Obey the Law*, 5 J. L. ECON. & ORG. 99, 100 (1989) (discussing whether one party will win or not depends "on the true guilt or innocence of the defendant" and the chance or legal error affecting that outcome).

[32] The idea of relative optimism has a long history in the economic analysis of litigation. *See, e.g.*, Robert D. Cooter & Daniel L. Rubinfeld, *An Economic Model of Legal Discovery*, 23 J. LEGAL STUD. 435, 439-40 (1994) (explaining that the older and simpler models of economic analysis of litigation and many subsequent models all involve the idea of a "surplus," which is defined as the "transaction costs saved" less "relative optimism"). One author explores relative optimism in detail. *See* Oren Bar-Gill, *The Evolution and Persistence of Optimism in Litigation*, 22 J. L. ECON. & ORG. 490, 490 (2006) (stating that evolutionary game theory helps explain why relative optimism persists in the context of litigation). The analysis of optimism in law and economics remains far behind that which has occurred in behavioral finance. *See, e.g.*, Ulrike Malmendier & Geoffrey Tate, *Behavioral CEOs: The Role of Managerial Overconfidence*, 29 J. ECON. PERSP. 37, 39 (2015) (explaining that behavioral factors, such as timing of exercising executive stock options, etc., are used to measure CEO overconfidence (*i.e.*, optimism) in behavioral finance economic analysis). Here we allow plaintiff and funder to be optimistic or pessimistic relative to the other.

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We let $C_p > 0$ be the cost to the plaintiff of taking her case to trial including legal fees, discovery costs, trial exhibits, travel expenses, expert witness fees, court costs, or other expenses, but excluding costs that are not out-of-pocket like opportunity costs of time and attention given to the litigation. We let $C_d > 0$ be the cost to the defendant, where we are assuming, denoted by the different subscripts, that the plaintiff and the defendant in general will have different litigation costs. We assume that C_p and C_d are both common knowledge in the sense that the parties and the funder each know the costs that each party will bear in the litigation. We also assume that the defendant is solvent (has the ability to pay) for the judgment J. The plaintiff has wealth W_P not including any expected value from the litigation. A plaintiff is budget-constrained with respect to the litigation if $W_p < C_p$. A plaintiff that is not budget-constrained can fund the litigation in full with her own money if she chooses to do so. I refer to this as "self-funding."

Litigation is perceived to be a positive expected value for the plaintiff if $P_i J - C_p > 0$, for $i = p$, d, and/or f. Negative expected value litigation is defined conversely. Throughout this Article, we assume that the funder and the defendant are risk-neutral but that the plaintiff may be either risk-neutral or risk-averse with a concave utility function $U(.)$.

The litigation funding contract has the funder pay proportion $\alpha \in [0, 1]$ (where $\alpha = 0$ is equivalent to no litigation funding) of the plaintiff's costs of litigation, C_p, in return for the plaintiff's promise to pay $R_\alpha \in (\alpha C_p, J)$ to the funder from the proceeds of any judgment, J, and nothing in the event of a loss. We assume that the funder earns at least an arbitrarily small positive expected return on the financing. Also, at least some, perhaps arbitrarily small, amount of J must be given to the plaintiff in the event of a victory to induce her participation. Funding is "full" when $\alpha = 1$ and "partial" when $\alpha \in (0, 1)$. We say that a plaintiff "receives" funding if the funder is willing to fund and "accepts" funding if she chooses to take it.

II. Risk-Neutral Plaintiffs

A. Identically-Calibrated Plaintiffs and Funders

Perhaps the most basic economic insight within the classic law and economics framework is that cases involving risk-neutral parties should settle immediately if:

$$P_p J - C_p < P_d J + C_d.[33]$$

That is, the case should settle if the risk-neutral plaintiff's expected gain from litigating is less than the risk-neutral defendant's expected loss, and the case should settle somewhere in the range of the two amounts.[34] Note further the well-known result that cases should always settle if the parties agree on J and P because the plaintiff's costs are a certain reduction from her expected gain (forcing the left side down) and the defendant's costs are a certain addition to his identical expected loss (forcing the right side up).[35] We set aside the possibility of immediate settlement. For the skeptical reader, we offer the assumption that $P_d << P_p$, so that settlement is initially infeasible.

We start by considering a risk-neutral plaintiff and a funder who are identically-calibrated. The risk-neutral plaintiff's problem is to maximize the following objective function:

$$\max_{\alpha, I} \{W_p + I[P_p(J - R_\alpha) - (1 - \alpha)C_p]\}, \qquad (1)$$

where I is the indicator function, taking on value 1 if litigation proceeds and 0 if not, and where the objective function is maximized subject to the following constraints:

$$I[W_p - (1 - \alpha)C_p] \geq 0 \qquad (2)$$
$$I[P_f R_\alpha - \alpha C_p] \geq 0. \qquad (3)$$

The first constraint is the plaintiff's budget constraint: her existing wealth minus the amount she spends on the litigation cannot be less than zero. The second constraint is the funder's participation constraint, where we assume the inequality holds strictly if $I = 1$. The risk-neutral funder must view funding as a positive expected value investment in order to fund.

We start by considering a plaintiff who is not budget-constrained- that is, a plaintiff with wealth $W_p \geq C_p$. The first proposition follows:

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[33] EDWARD ELGAR, THE ELGAR COMPANION TO LAW AND ECONOMICS 394 (Jürgen G. Backhouse ed., 2d ed. 2005).

[34] *Id*.

[35] Steven Shavell, *Suit, Settlement, and Trial: A Theoretical Analysis Under Alternative Methods for the Allocation of Legal Costs*, 11 J. LEGAL STUD. 55, 63 (1982).

PROPOSITION 1: *A risk-neutral plaintiff who is not budge-constrained and is identically calibrated to the funder does not accept funding.*

Proof: Suppose the plaintiff perceives the case as a positive expected value, $W_p + P_p J - C_p > W_p$. Then $I = 1$, $\alpha = 0$ (self-funding) generates greater expected wealth than $I = 0$, so the plaintiff will prefer self-funding to no litigation. But for any amount of funding, $\alpha > 0$, $W_p + P_p(J - R_\alpha) - (1 - \alpha)C_p = W_p + P_p J - P_p R_\alpha - (1 - \alpha)C_p < W_p + P_p J - C_p = W_p + P_p J - \alpha C_p - (1 - \alpha)C_p$ because by the funder's participation constraint and identically-calibrated beliefs, $P_p R_\alpha = P_f R_\alpha > \alpha C_p$. Therefore, the plaintiff does not accept any funding for a case she perceives to have a positive expected value. Now suppose the plaintiff perceives the case to be a negative expected value, $W_p + P_p J - C_p < W_p$. The plaintiff will not self-fund. But because $P_p J - C_p = P_f J - C_p < 0 \Rightarrow P_f R_\alpha < C_p$ even for maximum $R_\alpha \in [\alpha C_p, J)$, the plaintiff will not receive full funding. The plaintiff will not accept partial funding either, because the funder's participation constraint, $P_f R_\alpha > \alpha C_p$, would require funding on terms such that $W_p > W_p + P_p J - P_f R_\alpha - (1 - \alpha)C_p$.

EXAMPLE 1: Consider a large, risk-neutral (with respect to the litigation) corporation that holds a patent infringed by another company, its major competitor, also risk-neutral with respect to the litigation. The plaintiff company has an enterprise value of $1 billion and it will cost $20 million to pursue the claim against the competitor. The plaintiff company's board of directors who must authorize the litigation believes it has a 70% chance of prevailing for a judgment of $150 million. The plaintiff's case therefore has a subjective expected value of $85 million (70% x $150 million, the expected judgment, minus $20 million, the costs of litigation). The defendant company agrees on the potential damages of $150 million but believes the probability of the plaintiff's victory is 40% if the defendant spends $15 million to defend the case through trial.[36] The defendant faces a subjective expected loss of $75 million (40% x $150 million plus $15 million of litigation costs). The case will not settle because the plaintiff's expected gain exceeds the defendant's

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[36] Both in practice (in my experience) and in theory, probabilities of victory are partly a function of expenditure. *See, e.g.*, Bruce L. Hay, *Effort, Information, Settlement, Trial*, 24 J. Legal Stud. 29, 34-36 (1995) (discussing that the amount of money a party spends to review evidence and prepare for a case "may have a considerable impact on the rulings of judge and jury").

expected loss.[37] A litigation funder that shares the plaintiff's belief in a 70% chance of victory offers to finance the $20 million in litigation costs in return for $30 million in the event of a victory. This satisfies the funder's participation constraint because $P_f R_\alpha - \alpha C_p = 0.7(\$30$ million$) - 1(\$20$ million$) = \$1$ million > 0. But the plaintiff will reject the funding because the expected value of the fully funded litigation is $0.7(\$150$ million $- \$30$ million$) = \$84$ million $< \$85$ million, the expected return of self-funded litigation.start

Proposition 1 is useful because it carves out a potentially large group of litigants and cases from any use of litigation funding. So long as plaintiff and funder are identically-calibrated—even if, for example, both are very optimistic about the litigation relative to the defendant—there will not be litigation funding when the risk-neutral plaintiff can self-fund a case she perceives to be a positive expected value.[38] Nor will there be litigation funding for a perceived negative expected value case, when plaintiff and funder are identically-calibrated, since the funder will not provide full funding and the plaintiff will not accept any offered partial funding.[39]

We next consider the case where the risk-neutral plaintiff is budget-constrained. It is obvious that the risk-neutral plaintiff who is budget-constrained and identically-calibrated to the funder always receives full funding for positive expected value cases but does not receive full funding for negative expected value cases.[40] But that tells us only whether the plaintiff receives full funding, not whether she accepts it. Without more specification on R_α we cannot say whether the risk-neutral plaintiff who is identically-calibrated with the funder will reject full funding ($\alpha = 1$) in preference for partial funding ($0 < \alpha < 1$). Partial funding requires the plaintiff to pay $(1 - \alpha)C_p$ of the litigation costs. The risk-neutral plaintiff will reject partial funding unless it is lower (subjective expected) cost than full funding; that is, unless, for an $\alpha \in (0, 1)$ that satisfies the funder's participation constraint,

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[37] ELGAR, *supra* note 33, at 395.

[38] Joseph A. Grundfest & Peter H. Huang, *The Unexpected Value of Litigation: A Real Options Perspective*, 58 STAN. L. REV. 1267, 1293 (2006).

[39] Abrams & Chen, *supra* note 14, at 1091.

[40] *Id.* at 3.

$$P_p R_1 > P_p R_\alpha + (1 - \alpha)C_p,$$

where R_1 denotes the return that the litigation funder requires for full funding. Suppose that the litigation funding contract is linear,

$$R_\alpha = \frac{\mu \alpha C_p}{P_f}$$
$$\mu \geq 1.$$

This allows us to advance an additional proposition for the risk-neutral plaintiff who is identically-calibrated with the funder:

PROPOSITION 2: *When the litigation funding contract is linear, a risk-neutral plaintiff who is budget-constrained and is identically-calibrated to the funder accepts only the funding she needs to clear the budget constraint (or the next greater available amount) for a positive expected value case and does not receive funding for a negative expected value case.*

Proof: Suppose the plaintiff perceives the case to be a positive expected value and that $P_p R_1 > P_p R_\alpha + (1 - \alpha)C_p$ for some subset of partial funding proportion that satisfies the funder's participation constraint, $\alpha \in (\alpha_L, \alpha_H)$. Because the plaintiff and funder are identically-calibrated and since, because $\mu \geq 1$, the plaintiff's expected return from litigation,

$$P_p(J - \frac{\mu \alpha C_p}{P_f}) - (1 - \alpha)C_p = P_p J - C_p - C_p(\mu \alpha - \alpha),$$

is strictly decreasing in α, the plaintiff chooses the lowest possible α consistent with receiving funding and clearing her budget constraint. The plaintiff will not receive full funding for a negative expected value case and will not accept any partial funding received for a negative expected value case for the same reasons given for an unconstrained plaintiff in proving Proposition 1.

EXAMPLE 2: Consider a risk-neutral litigation trustee that manages and makes all decisions for a litigation trust. The litigation trust was seeded with $1 million in a bankruptcy court liquidation proceeding for an underlying bankrupt company. The funds were to pursue a number of small claims, the litigation trustee has collected those judgments, and now has $2.5 million in total assets. Now, however, the litigation trustee

has found a previously undiscovered fraudulent transfer claim against a defendant it has standing to sue. It will cost $5 million for the litigation trust to pursue the claim against the defendant. The litigation trustee believes she has a 60% chance of prevailing against the defendant for a judgment of $25 million. The litigation trustee's case therefore has a subjective expected value of $10 million (60% x $25 million, the expected judgment, minus $5 million, the costs of litigation). We assume this is higher than the defendant's expected loss, so the case will not settle if brought. The litigation trustee is clearly budget-constrained, having only $2.5 million. A litigation funder that shares the litigation trustee's belief in a 60% chance of victory offers to finance the $5 million in litigation costs in return for $10 million in the event of a victory or, in the alternative, to finance half the costs ($2.5 million), in return for $5 million in the event of a victory. Both arrangements satisfy the funder's participation constraint since $P_f R_\alpha - \alpha C_p = 0.6(\$10$ million) $- 1(\$5$ million) $= \$1$ million > 0 and $0.6(\$5$ million) $- 0.5(\$5$ million) $= \$500,000 > 0$. The litigation trustee will reject full funding and accept partial funding; however, since the expected value of the fully funded litigation is $0.6(\$25$ million $- \$10$ million) $= \$9$ million $< \$9.5$ million $= 0.6(\$25$ million $- \$5$ million) $- \$2.5$ million, the expected value of partial ($\alpha = 0.5$) financing.

B. Optimistic Plaintiffs

We next take up the case of differently-calibrated plaintiffs and funders, maintaining our assumption that cases do not settle immediately because plaintiffs are very optimistic relative to defendants. We start with the case of the optimistic plaintiff, where $P_p > P_f$.

It is evident on inspection of the prior results that nothing much changes when the plaintiff is optimistic relative to the funder. A risk-neutral, optimistic plaintiff who is not budget-constrained does not accept funding for reasons that are clear from the proof of Proposition 1, noting that if the optimistic plaintiff perceives the case to be a negative expected value, then the funder must as well, so no financing that the plaintiff will accept will be received.[41]

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[41] *See* discussion *supra* Part II.

Thus, the availability of litigation funding does not expand the amount of litigation simply by allowing funding of cases that optimistic plaintiffs want to bring when the optimistic plaintiff is risk-neutral and not budget-constrained.[42] Such plaintiffs do not turn such cases over for litigation funding and will self-fund the same cases she would have brought before.[43] Moreover, such plaintiffs will not obtain financing from litigation funders to fund cases they perceived to be negative expected value cases and, therefore, would not have brought absent the general availability of litigation funding.[44] With linear funding contracts, optimistic, budget-constrained plaintiffs still limit their funding to the amount they need, and like unconstrained plaintiffs, they do not receive funding for negative expected value cases.[45]

C. Pessimistic Plaintiffs

We now move to the case of pessimistic plaintiffs, where $P_p > P_f$. The pessimistic, risk-neutral plaintiff perceives the probability of victory to be lower than the probability of victory that the funder perceives.[46] Things now get more interesting. It is obvious from the above that a pessimistic plaintiff that is not budget-constrained will not accept any funding for a case she perceives to have a positive expected value because the funder must always receive at least infinitesimally more than αC_p (and more if $P_f < 1$) in the event of victory.[47] So litigation funding always has lower expected return than self-funding.[48] Perceived negative expected value cases are different.

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[42] *See* Roni A. Elias, *Mythbusting: Why Critics of Litigation Finance Are Wrong,* THE FEDERAL LAWYER (Dec. 2017) at 39-40 (analyzing foreign litigation funding that results in "fairer outcomes and better judicial decisions").

[43] Heaton, *supra* note 2.

[44] *Id.*

[45] One obvious problem that optimistic plaintiffs present, of course, is that they may resist settlements that the funder wishes the plaintiff would take. In conversations, litigation funders report this to be a significant problem in practice.

[46] Heaton, *supra* note 2.

[47] *Id.*

[48] *Id.*

PROPOSITION 3: *A pessimistic, risk-neutral plaintiff that is not budget-constrained and who perceives her case to be a negative expected value may receive and accept full or partial funding for that case.*

Proof: When the pessimistic, risk-neutral plaintiff perceives the case to be a negative expected value, she will accept funding of some kind (if it is an option) rather than forgo the litigation so long as $W_p + P_p(J - R_\alpha) - (1 - \alpha)C_p > W_p$. Consider the linear contract above,

$$R_\alpha = \frac{\mu \alpha C_p}{P_f} + \varepsilon, \text{ with } \mu = 1,$$

where ε is an arbitrarily small increment over a zero expected return (in the funder's perception) on its investment, consistent, for example, with significant competition in the market for litigation funding and the funder's risk neutrality. Suppose further that $P_f R_\alpha > \alpha C_p$ for some α. The plaintiff's expected return from accepting this funding rather than forego litigation is:

$$C_p \alpha \left(1 - \frac{P_p}{P_f}\right) - (C_p - P_p(J - \varepsilon))$$

The first parenthetical term is perceived by the plaintiff to be positive because of plaintiff pessimism ($P_p < P_f$), while the second parenthetical term is perceived by the plaintiff to be negative by the assumption that she perceives the litigation to be a negative expected value. So long as this expected return is greater than zero at funding α that satisfies the funder's participation constraint, the plaintiff will accept funding rather than forego the negative expected value case.[49] Additionally, because the expected return is strictly increasing in α for a pessimistic plaintiff, she will prefer as much funding as she can receive.[50]

Proposition 3 tells us that "the availability of litigation funding may expand the litigation of (plaintiff-subjectively-perceived) negative ex-pected value cases when optimistic funders meet pessimistic plaintiffs"[51] who are not budget-constrained and who have cases that the pessimistic

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[49] *See id.* (noting that risk-neutral, pessimistic plaintiffs in negative expected value cases may still receive and accept full or partial funding).

[50] *Id.*

[51] *See supra* text accompanying note 17.

plaintiffs would not otherwise fund on their own. This points to a sort of adverse selection problem where plaintiffs who perceive their cases to be negative expected value will find it in their interest to pursue a case with funding, perhaps putting some of their own money into the case if doing so with funder-financing has a higher expected return than foregoing the case altogether.[52] Similar results hold, of course, for the budget-constrained, risk-neutral, pessimistic plaintiff.

EXAMPLE 3: Consider again a large, risk-neutral (with respect to the litigation) corporation that holds a patent infringed by another company, its major competitor, which is also risk-neutral with respect to the litigation. The company has an enterprise value of $1 billion and it will cost $18 million to pursue a claim against the competitor. It believes it has a 70% chance of prevailing against the company for a judgment of $25 million. The plaintiff's case therefore has a negative expected value of -$500,000 (70% x $25 million, the expected judgment, minus $18 million, the costs of litigation). The defendant company agrees on the potential damages of $25 million, and agrees that the probability of the plaintiff's victory is 70% if the defendant spends $15 million to defend the case through trial. The defendant faces an expected loss of $32.5 million (70% x $25 million plus $15 million of litigation costs), but will not make a settlement with the plaintiff because the case is a negative expected value. An optimistic litigation funder (optimistic relative to the pessimistic plaintiff) with belief in a 90% chance of victory offers to finance the $18 million in litigation costs in return for $21 million in the event of a victory. This satisfies the funder's participation constraint since $P_f R_\alpha - \alpha C_p = 0.9(\$21 \text{ million}) - 1(\$18 \text{ million}) = \$900,000 > 0$. The plaintiff will accept full funding since the expected value of the fully-funded litigation is $0.7(\$25 \text{ million} - \$21 \text{ million}) = \$2.8 \text{ million} > 0$, the expected return of not pursuing the litigation at all.

III. Risk-Averse Plaintiffs

We now turn our attention to a risk-averse plaintiff. Let $U(.)$ be the plaintiff's utility function. An individual is risk-averse if she always

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[52] Heaton, *supra* note 2.

prefers the expected value of an uncertain outcome to the uncertain outcome itself.[53] That is,

$$U\left(PW_A + (1 - P)W_B\right) > PU\left(W_A\right) + (1 - P)U\left(W_B\right), \qquad (4)$$

an inequality that holds if and only if the function $U(.)$ is concave over the relevant wealth levels, W_A and W_B, where $W_A \neq W_B$. By the intermediate value theorem of calculus, and given $0 \leq P \leq 1$, there is a number W_C where $W_A < W_C < W_B$ such that $U(W_C) = PU(W_A) + (1 - P)U(W_B)$. WC is known as the "certainty equivalent" of the gamble generating W_A or W_B with probabilities P and $(1 - P)$, respectively. That is, a person with utility function $U(.)$ will be indifferent between the uncertain prospect of W_A with probability P and W_B with probability $(1 - P)$ versus the sure thing of W_C.

Armed with the idea of the certainty equivalent, we can ease our analyses in the risk-averse cases considerably by employing "risk-neutral probabilities."[54] Risk-neutral probabilities are "pseudo-probabilities" (that is, not the actual subjective probabilities) obtained through a change of measure to obtain probabilities that can be used to interpret a certainty equivalent "payoff" as if the person valuing the payoffs was not a risk-averse individual valuing the payoffs at her true subjective probabilities, but a risk-neutral individual valuing the payoffs at the risk-neutral probabilities.[55] "The risk-neutral probabilities coincide with actual subjective probabilities if agents are in fact risk-neutral—otherwise they contain in addition adjustments for risk aversion."[56]

Let S_N (with the subscript N denoting "no funding") be the certainty equivalent of the litigation (which can be thought of as the acceptable settlement amount) such that the plaintiff is indifferent between pursuing

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[53] *Id.* (stating that "being risk-averse can make a litigant act like she thinks her chances are worse than she really believes they are").

[54] *Id.*

[55] Stephen F. LeRoy, *Efficient Markets and Martingales*, 27 J. ECON. LIT. 1583, 1606 (1989).

[56] *Id.* Here, by contrast with derivatives-pricing models, we assume for simplicity that the pure time value of money is zero. Relaxing this assumption would merely introduce some additional terms without shedding light on the issues at hand.

the litigation and receiving the certainty-equivalent settlement. Then S_N satisfies

$$U\,(W_p + S_N\,) = P_P\,U\,(W_p + J - C_p) + (1 - P_p)U\,(W_p - C_p).$$

Finding the risk-neutral probabilities in a simple two-state (win-lose) problem like this one is straightforward. We know (trivially) that the individual plaintiff is indifferent between the settlement that pays S_N in the event of a win and S_N in the event of a loss (the certainty equivalent) and the litigation that pays off $W_P + J - C_P$ in the event of a win and $W_P - C_P$ in the event of a loss.[57] This implies there is a probability π_N (which is *not* the plaintiff's actual subjective probability of victory, P_P), such that

$$W_p + S_N = \pi_N\,(W_p + S_N\,) + (1 - \pi_N\,)(W_p + S_N\,)$$
$$W_p + S_N = \pi_N\,(W_p + J - C_p) + (1 - \pi_N\,)(W_p - C_p)$$

which has the solution

$$\pi_N = \frac{S_N + C_p}{J}$$

$$(5)$$

It is easy to confirm that solution satisfies the requirement for a probability that $0 \le \pi_N \le 1$, since, as for $0 \le \pi_N$, all that is required is that S, C, and J are each positive, with J strictly so. As for $\pi_N \le 1$, all that is required is that $S_N \le (J - C_p)$, that is, that the defendant never pays a settlement greater than the plaintiff's best case with a trial.

It is also easy to see that $\pi_N < P_p$, that is, the risk-neutral probability is strictly less than the plaintiff's subjective probability of victory. Recall that risk aversion means that the utility of the expected value of the litigation is greater than the expected utility of the litigation, that is, U $(P_p(W_p + J - C_p) + (1 - P_p)(W_p - C_p)) > P_pU\,(W_p + J - C_p) + (1 - P_p)U$

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[57] *See* James J. Prescott & Kathryn E. Spier, *A Comprehensive Theory of Civil Settlement*, 91 N.Y.U. L. REV. 59, 73 (2016) (stating that a risk-averse plaintiff is indifferent between litigating and settling for the case's expected value minus the litigation costs).

$(W_p - C_p)$. Since S_N is the certainty equivalent of (that is, has the same utility as) the expected utility of the litigation, P_pU $(W_p + J - C_p) + (1 - P_p)U$ $(W_p - C_p)$, U $(P_p(W_p + J - C_p) + (1 - P_p)(W_p - C_p)) > U$ (S_N) implies that

$$S_N < P_p(W_p + J - C_p) + (1 - P_p)(W_p - C_p)$$

$$\Longleftarrow\Longrightarrow$$

$$P_p > \frac{S_N + C_p}{J} = \pi_N.$$

This view of risk aversion, which is generally understood in the finance literature that makes wide application of risk-neutral probability measures,[58] has not been emphasized in the economic analysis of litigation: risk aversion makes a plaintiff act as a risk-neutral plaintiff would act if facing a probability of victory of π_N less than the actual subjective probability she holds, P_p.[59] The change of measure to risk-neutral probabilities allows us to adapt the results above quite easily. In the cases where risk-averse plaintiffs and funders are identically-distributed, risk aversion is observationally equivalent to plaintiff pessimism.[60] Like pessimistic, risk-neutral plaintiffs, risk-averse, identically-distributed plaintiffs may receive and accept funding.[61] Further, plaintiffs that are actually optimistic relative to the funder, may

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[58] *See, e.g.*, David Backus et al., *Disasters Implied by Equity Index Options*, 66 J. FIN. 1969, 1986 (2011) ("In representative-agent models, risk aversion generates risk-neutral distributions that are shifted left (more pessimistic) relative to true distribution."); BERNARD DUMAS & ELISA LUCIANO, THE ECONOMICS OF CONTINUOUS-TIME FINANCE 62 (2017) ("Risk-neutral probabilities in this sense are pessimistic, in that they 'put more weight' on low-consumption states.").

[59] Heaton, *supra* note 2.

[60] Researchers have made this observation in other contexts:

For instance, in the context of lotteries, which are often used to measure the risk aversion level, the reservation price of a risk-averse (resp. risk-tolerant) and unbiased individual is empirically indistinguishable from the reservation price of a risk-neutral and pessimistic (resp. optimistic) individual; there is here an identification problem that confounds data interpretation.

Elyès Jouini et al., *Are Risk-Averse Agents More Optimistic? A Bayesian Estimation Approach*, 23 J. APPL. ECONOMETRICS 843, 844 (2007).

[61] *See* discussion *supra* Part III.

be sufficiently risk-averse that they act "as if" they are pessimistic and accept funding, even when they are not budget-constrained.[62]

Thus, an interesting feature of litigation funding is that it allows risk-averse plaintiffs to act more like they would act if they were risk-neutral.[63]   Consider, for example, the case of identically-calibrated plaintiff, funder, and defendant where the case is a perceived positive expected value, but where the plaintiff's risk aversion is such that she will not pursue the case. That is, where:

$$P_p = P_f = P_d = P$$
$$PJ - C_p < PJ + C_d$$
$$S_N = 0.$$

This scenario should trouble us because "[a] good justice system should generate results driven by case merits."[64] But risk aversion allows risk-neutral litigants, like large organizations, to benefit by escaping meritorious (in the sense of positive expected value) litigation, or (supposing S_N was very small relative to $PJ - C_p$) to benefit from risk-averse settlements that a risk-neutral litigant would have refused.[65] The result is that some cases are settled as if their merits were much worse, resulting in potentially good cases settling like bad cases.[66] One benefit of the acceptance of litigation funding is that it may move such cases closer to their risk-neutral outcomes, and therefore arguably closer to their merits.[67]

PROPOSITION 4: *When received and accepted, litigation funding allows a plaintiff to pursue litigation more like she would if she were not risk averse.*

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[62] *See* discussion *supra* Part II.C.

[63] *See* Jouini et al., *supra* note 60, at 1 ("Risk aversion and individual subjective probability completely determine the individual decision-making behavior . . . .").

[64] Heaton, *supra* note 2.

[65] Robert B. Calihan et al., *The Role of Risk Analysis in Dispute and Litigation Management*, American Bar Association 27th Annual Forum on Franchising (Oct. 6-8 2004), at 1, https://www.coursehero.com/file/31632878/Paper-on-Risk-Analysis-for-ABA-Forum-on-Franchisingpdf.

[66] *Id.* at 12.

[67] Anthony Heyes et al., *Legal Expenses Insurance, Risk Aversion and Litigation,* 24 INT'L REV. L. & ECON. 107, 116-17 (2004).

Proof: Suppose $P_p = P_f = P_d = P$, $PJ - C_p < PJ + C_d$, and $S_N = 0$.

Then $\quad \pi_N = \dfrac{C_p}{J}$

The risk averse plaintiff will accept full funding if π_F ($W_p + J - R_\alpha$ $=1) + (1 - \pi F)W_p > W_p$. In that case, holding all other quantities constant, $S_F > 0 = S_N$ would require a lower level of risk aversion to be the certainty-equivalent without funding. Therefore, litigation funding allows the risk-averse plaintiff to act as if she was less risk-averse at the same subjective probability of victory.

EXAMPLE 4: Consider a small company that, as a result of the risk aversion of its owners, whose wealth is concentrated in ownership of the company, acts as if it is risk-averse with natural log utility, ln(enterprise value). The company's enterprise value before litigation is $6 million. The company has been the victim of a breach of contract by a large supplier that diminished the company's enterprise value to this level from a pre-breach value of $18.5 million. It would cost $5.4 million to pursue a claim against the breaching supplier. The company's directors believe the company has a 70% chance of prevailing against the supplier for a judgment of $12.5 million, all of which will accrue to the enterprise value of the company, returning it to its pre-breach value. Therefore, the plaintiff's case has an expected value of $3.35 million (70% multiplied by $12.5 million, the expected judgment, minus $5.4 million, the costs of litigation). The defendant's expected value, based on a cost of litigation of $5 million and the same view as the plaintiff as to the judgment and probability of victory, is $13.75 million, but the defendant rightly believes that the plaintiff company will not bring the case if it must finance it itself. The plaintiff's utility function is such that the expected utility of bringing the case is Pp $\ln(W_p + J - C_p) + (1 - P_p)$ $\ln(W_p - C_p) = 0.70(\$6 \text{ million} + \$12.5 \text{ million} - \$5.4 \text{ million}) + 0.30(\$6$ million $- \$5.4$ million$) = 11.47 + 3.99 = 15.46 < 15.61 = \ln(\$6 \text{ million})$, the expected utility of not bringing the case. Because of its risk-aversion, the plaintiff company is acting as would a risk-neutral plaintiff that faced $\pi_N = 0.568 < 0.70 = P_p$. A litigation funder that shares the plaintiff's belief in a 70% chance of victory offers to finance the $5.4 million in litigation costs in return for $8.1 million in the event of a victory. This satisfies the funder's participation constraint since $P_f R_\alpha - \alpha C_p = 0.7(\$8.1$ million$) - 1(\$5.4 \text{ million}) = \$270,000 > 0$. The plaintiff will accept the

funding, since the expected utility of the fully funded litigation is $P_p \ln(W_p + J - R_\alpha) + (1 - P_p) \ln(W_p) = 0.70(\$6 \text{ million} + \$12.5 \text{ million} - \$8.1 \text{ million}) + 0.30(\$6 \text{ million}) = 11.31 + 4.68 = 15.99 > 15.61 = \ln(\$6 \text{ million})$.

Conclusion

Litigation funding is growing and becoming more controversial as it does.[68] This Article explores litigation funding in the tradition of the seminal models of economic analysis of litigation. When a risk-neutral plaintiff and the funder share the same perceived probability of victory, or when the risk-neutral plaintiff is optimistic relative to the funder, the risk-neutral plaintiff who is not budget-constrained does not take financing, and the budget-constrained plaintiff takes only as little as she can. A risk-neutral, pessimistic plaintiff, however, may receive and accept funding for a negative expected value case.

I use the concept of risk-neutral probability from financial derivatives pricing to analyze the risk-averse plaintiff. Risk aversion makes a plaintiff act as a risk-neutral plaintiff would act if facing a probability of victory less than the actual subjective probability she holds. This allows us to adapt the risk-neutral results quite easily. In the cases where risk-averse plaintiffs and funders share probabilistic beliefs about a plaintiff victory, risk-aversion is observationally equivalent to plaintiff pessimism. Similar to the pessimistic, risk-neutral plaintiffs, risk-averse plaintiffs who share the same probabilistic belief of victory as their funders may receive and accept funding that they would not have accepted if risk-neutral. Additionally, plaintiffs that were optimistic relative to the funder may be sufficiently risk-averse that they too act as if they are pessimistic and accept funding even when they are not budget-constrained.

An interesting feature of litigation funding—viewable through the lens of risk-neutral probabilities—is that it allows risk-averse plaintiffs to act more like they would act if they were risk-neutral, allowing them to pursue meritorious cases they would otherwise forego simply because

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[68] *See* sources cited s*upra* notes 1-2.

of risk aversion.[69] This suggests that, although litigation funding may expand the pursuit of some negative expected value cases, it may provide a significant benefit even for plaintiffs that are not budget-constrained in allowing those plaintiffs to pursue meritorious litigation that defendants might otherwise escape or settle on terms that do not reflect case merits.

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[69] *See*, *e.g.*, Jonathan T. Molot, *Litigation Finance: A Market Solution to a Procedural Problem*, 99 GEO. L. J. 65, 71 (2010) ("[T]he risk aversion of the defendant's capital providers, and the dynamics of the pending deal, may drive settlement amounts as much as the underlying merits of the suit.").