MEMORANDUM

To: My Faculty Readers

Re: Attached Paper—An Investigation Model of Frivolous Suits

Date: November 20, 2012

The attached paper is still quite rough. I didn’t have time to polish it or to check all the points carefully. As a result, there might be some mistakes here and there. I hope none are major. Of course, if you see any, minor or major, I’d appreciate your bringing them to my attention.

This is an old draft that I’ve had sitting around for a long time and never bothered to publish. When I agreed to do a CLBE seminar several months ago, I had hoped to have a new law-and-economics paper to present. As it turns out, the projects I’ve been working on lately are not suitable for the seminar. (Well, in truth, one is, sort of, but the attached is better.) Therefore, I decided to revise and update this old paper.

Some of the results in this paper were presented informally in an article I published about fifteen years ago. The attached paper proves those results formally and extends them a bit. It also critically surveys the literature on frivolous suits published over the past fifteen years.

The paper has a lot of math. This is hard to avoid when one uses game-theoretic models. However, I explain the intuitions behind the different models and try to describe the results in an accessible way. I’ll do the same when I present the paper.

I look forward to your comments and questions.

Please Note: This is a preliminary draft prepared specifically for the CLBE seminar. Please do not quote or cite without the author’s permission.
AN INVESTIGATION MODEL OF FRIVOLOUS SUITS

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ABSTRACT

Frivolous litigation has been a major concern of the procedural system for decades, and the existing law-and-economics literature includes many articles offering explanations for frivolous suits. Yet frivolous litigation remains rather puzzling. The question is why a plaintiff would ever bring a suit that has (virtually) no chance of winning at trial, or, equivalently, why a defendant would ever settle such a suit. A promising type of explanation relies on informational asymmetry. Avery Katz has analyzed cases in which the plaintiff knows her suit is meritless but the defendant does not. This Article analyzes the reverse asymmetry, in which the defendant knows the suit is meritless but the plaintiff does not. Much litigation that prompts frivolous suit concerns, such as securities fraud and antitrust suits, falls into this category. When the defendant has private information about the merits, meritless suits are properly treated as frivolous only when the plaintiff fails to conduct a reasonable pre-filing investigation. To analyze this scenario, the Article develops a formal model in which uninformed plaintiffs choose how much to investigate and defendants choose whether to settle and for what amount without knowing whether the plaintiff has investigated. The model has several (perfect Bayesian) equilibria, depending on the costs and benefits of investigation. In the most salient of these, all plaintiffs as well as defendants in meritorious suits employ mixed strategies, with the result that some meritorious suits go to trial and some settle for nothing and some meritless suits proceed through discovery. The Article uses this model to define a "reasonable" pre-filing investigation, to assess the impact of frivolous litigation on the settlement of meritorious suits, litigation costs, and unjustified wealth transfers, and to examine some regulatory implications.

The problem of frivolous litigation has been a major focus of concern in debates over procedural reform for at least the past thirty years. Critics of the current system blame frivolous suits for clogging the courts, increasing aggregate litigation costs, and producing bad settlements. Despite all this attention, however, frivolous litigation is still a bit of a mystery. The standard assumption is that plaintiffs file frivolous suits to obtain settlements. But this assumption begs a difficult question: Why would a defendant ever agree to settle a frivolous suit? This Article surveys past efforts to answer this question and offers an explanation that

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† Cites.
accounts for filing incentives in a large class of cases not covered by existing models. In these cases, plaintiffs do not know whether their lawsuits are meritorious or meritless, but defendants do. In equilibrium, plaintiffs file meritless as well as meritorious suits without investigating even when the cost of an investigation is reasonable.

The assumption of a serious frivolous suit problem has had a major impact on procedural reform. During the 1980s, for example, lower federal courts tightened pleading requirements in areas such as civil rights, antitrust, and derivative shareholder litigation to screen frivolous suits.\(^2\) In *Bell Atlantic Corp. v. Twombly* and *Ashcroft v. Iqbal*, the Supreme Court imposed stricter pleading requirements across-the-board and did so in large part for the same reason, to screen frivolous suits at the pleading stage.\(^3\) Moreover, Rule 11 of the Federal Rules of Civil Procedure, the main source of federal power to penalize frivolous litigation, was strengthened in 1983 to enhance the sanctioning power of district judges.\(^4\) While its harshest provisions were removed in 1993, it still imposes serious investigation and filing requirements on litigants. As yet another example, the Supreme Court expanded the availability of summary judgment in 1986 and did so in order to weed out frivolous suits prior to trial.\(^5\)

Concerns about frivolous litigation have also had a powerful impact on federal class action law. In the late 1990s and early 2000s, federal courts began to impose stricter certification requirements to guard against frivolous and weak class action suits.\(^6\) Easy certification, it was thought, enabled class plaintiffs—or more precisely, the class attorney—to leverage the threat of

\(^2\) Cites.
\(^3\) *See* *Ashcroft v. Iqbal*, 556 U.S. 662 (2009); *Bell Atl. Corp. v. Twombly*, 550 U.S. 544 (2007). And the Supreme Court did this after more than a decade of efforts to halt the trend in the lower courts. *Leatherman, Swierkiewicz.*
\(^4\) Cites
\(^5\) Cite to *Celotex* trilogy.
\(^6\) *See, e.g.*, *Szabo v. Bridgeport Machines, Inc.*, 249 F.3d 672 (7th Cir. 2001); *In the Matter of Rhone–Poulenc Rorer, Inc.*, 51 F.3d 1293 (7th Cir. 1995).
a huge recovery and massive litigation costs to secure a settlement from a risk-averse defendant.\textsuperscript{7}

Some have questioned the magnitude of this problem, but the perception of serious abuse remains strong.\textsuperscript{8}

Congress, too, has been active during this period. It adopted the Private Securities Litigation Reform Act in 1995 and the Prison Litigation Reform Act in 1996 in part to deter frivolous securities fraud class actions and prisoner pro se litigation. Periodically over the past eight years, and most recently in 2011, Congress has entertained, though not yet passed, the Lawsuit Abuse Reduction Act, which would make Rule 11 sanctions stricter.\textsuperscript{9}

Despite all this activity, there is little reliable empirical evidence of a serious frivolous suit problem. In fact, empirical work in this field faces a number of serious obstacles. Lawyers do not admit to filing frivolous suits. Moreover, most suits settle and individual settlements are often kept confidential. As a result, data about outcomes is difficult to obtain. There are some empirical studies in specific areas, such as securities fraud and medical malpractice litigation, but these are limited.\textsuperscript{10}

However, the literature contains numerous theoretical accounts that offer a variety of explanations for filing and settlement incentives. Much of this literature addresses the general question of why plaintiffs are able to obtain settlements in negative expected value (NEV) suits; that is, suits where the plaintiff’s expected litigation costs exceed her expected trial recovery.

This NEV literature is helpful to some extent, since frivolous suits usually are negative expected

\textsuperscript{7} Szabo, 249 F.3d at 675-76; Rhone-Poulenc, 51 F.3d 1293; see also Dukes v. Wal-Mart Stores, Inc., 603 F.3d 571, 591 (9th Cir. 2010), rev’d on other grounds U.S. (“Nearly every circuit to consider the issue has recognized the practical importance of the certification decision as leverage for settlement”); In Re Hydrogen Peroxide Antitrust Litigation, 552 F.3d 305, 310 (3d Cir. 2008); Unger v. Amedysis, Inc., 401 F.3d 316, 322 (5th Cir. 2005); In Re New Motor Vehicles Canadian Export Antitrust Litigation, 522 F.3d 6, 26 (1st Cir. 2008).

\textsuperscript{8} See Charlie’s article criticizing some of the claims about frivolous class action suits.

\textsuperscript{9} Lawsuit Abuse Reduction Act of 2011, S. 533 (112th Cong.)

\textsuperscript{10} Cites.
value suits. However, many of the models break down when the probability of plaintiff’s success approaches zero, as it does in frivolous suits.

Moreover, the most promising models have trouble accounting for cases in which the defendant is informed of the liability merits but the plaintiff is not. This type of case is quite common, and it describes many, if not most, of the situations that trigger intense concern today. These cases are considered frivolous when the plaintiff files suit without conducting a reasonable pre-filing investigation that, if it had been done, would have disclosed that the suit lacked merit. The model I present here analyzes this type of frivolous suit.

This Article has two principal objectives. First, it critically reviews the current literature modeling NEV and frivolous suits. Second, it presents a formal investigation model that assumes asymmetric information both about the merits and about plaintiff’s decision to investigate. In 1997, I published *Modeling Frivolous Suits*, which analyzed the frivolous litigation models available at the time and informally described the investigation model. The literature has grown over the past fifteen years. This Article surveys the new literature as well as the old, presents a formal version of the investigation model, and explores a broader range of implications.

The remaining discussion is divided into seven Parts. Part I summarizes the existing literature. Some of the published models assume frivolous suits have positive expected value (PEV), but most assume, more realistically, that the lawsuit is NEV. Some of these NEV models suppose that there is complete information about the merits and focus on asymmetries in the amount or distribution of costs. Other models assume instead that information is asymmetric.

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While these are more promising than the complete information models in many respects, they have limited reach. Most focus on strike suits in which private information belongs to the plaintiff and ignore cases where the asymmetry is reversed. Finally, some theories rely on bounded rationality, but bounded rationality explanations also have limitations.

Part II describes my investigation model, and Part III derives the equilibria. Part III.A explains the underlying intuition, and Part III.B solves the model formally. The analysis shows, among other things, that a rational plaintiff might file a meritless suit without investigating even when the cost of investigating is moderate, an investigation would perfectly reveal suit type, and meritless suits always lose at trial and never receive a positive settlement offer. In the model, plaintiffs expect to learn something about suit type from defendant’s settlement offer. As a result, they employ a mixed strategy in equilibrium, foregoing an investigation some of the time even when an investigation is not too expensive. Defendants in turn anticipate this strategy and pool in meritorious cases. As a result, some meritless suits are filed, some meritorious suits go to trial rather than settle, and some meritorious suits yield no recovery at all.

Part IV uses the results of Part III to define a “frivolous” suit. Part V then presents the comparative statics as background for Part VI, which explores the model’s implications for three common regulatory approaches to deterring frivolous suits—strict pleading, penalties, and fee shifting—as well as two novel approaches discussed in the literature. Part VII concludes with a summary and some general observations about the limitations of the model and possible extensions.
I. Existing Frivolous Suit Literature

At the outset, it is important to define a “frivolous suit.” It turns out that this is extremely difficult to do. As I have explained elsewhere, much of the problem has to do with the fact that the label “frivolous” has normative as well as descriptive content.\textsuperscript{12} It is often used to denote lawsuits that the user believes \textit{should} not be filed for some reason. Thus, a civil rights suit that is weak on the merits because it pushes the boundaries of civil rights law might be labeled frivolous by some critics even though it has a nontrivial chance of success and an arguably legitimate reason to be litigated.

One thing is clear. It cannot be sufficient that the suit has negative expected value. If that were enough, even a suit that is reasonably strong on the merits would have to be labeled “frivolous” if litigation costs were high. Nor is there general agreement that any suit with a low probability of success is frivolous. This definition would condemn civil rights suits that are weak because they advance a novel legal theory, a position that many reject.

Nevertheless, I believe that the term has a relatively uncontroversial core meaning. A suit is frivolous: (1) when a plaintiff files knowing facts that establish complete absence of merit as an objective matter on the legal theories that the plaintiff alleges, or (2) when a plaintiff files without conducting a reasonable investigation which, if conducted, would place the suit in the first category.\textsuperscript{13} This Article analyzes the second type of frivolous suit.

It follows from this brief discussion that there is a difference between suits that are meritless and suits that are frivolous. The distinction is not so important for the first type of frivolous suit. When a plaintiff files a meritless lawsuit knowing that it is meritless, the lawsuit

\textsuperscript{12} See \textit{Modeling Frivolous Suits}.
\textsuperscript{13} This does not mean, of course, that the plaintiff can never win a frivolous suit at trial. Judges and juries do make mistakes.
is also frivolous according to the definition, and when a suit is frivolous by this definition, it is also meritless. However, the distinction between meritless and frivolous is important for the second type of frivolous suit, which I focus on in this Article. According to this part of the definition, a frivolous suit is meritless, but a meritless suit is not necessarily frivolous. Accordingly, the following discussion refers to meritless suits without necessarily condemning them as frivolous and reserves the label frivolous for suits that meet the definition.

There are four different types of theories that seek to explain the filing and settlement of frivolous suits. One type assumes that some frivolous suits are in fact positive expected value (PEV) at the time of filing. The second type assumes that suit is NEV at the time of filing and that there is complete (symmetric) information about the merits. This second type of theory focuses on cost asymmetry, cost distribution, or reputation to explain frivolous filings. The third type of theory also assumes suit is NEV, but focuses on asymmetric information to explain filing and settlement incentives. The fourth type relies on bounded rationality. The following discussion briefly examines each in turn.

A. PEV Theories

A PEV theory supposes that some frivolous suits are actually PEV from the perspective of a plaintiff deciding whether to file. There are three ways this can happen: the plaintiff seeks extra-legal remedies; the suit has very high stakes in relation to costs and trial mistakes are frequent enough, or the suit has a large enough option value.

1. Extra-Legal Remedies

One way that a suit can be PEV is if the plaintiff receives extra-legal benefits from suing and values those benefits highly enough. For example, a plaintiff might seek revenge or personal
vindication. However, these extra-legal benefits would have to be valued very highly to make suit PEV, so this explanation is not likely to account for much frivolous litigation.  

2. **High Stakes and Jury Error**

Because juries make mistakes, there is a strictly positive probability that a plaintiff with a frivolous suit will prevail at trial. Let $q$ be the risk of error in a meritless suit. Let $x$ be the expected trial award conditional on success and let $c$ be plaintiff's expected litigation costs through trial. If $x$ is large enough and $c$ small enough, it is possible that $qx - c > 0$, in which case the suit is PEV.

For suit to be PEV, however, the ratio of costs to stakes, $c/x$, must be less than the error risk, $q$. This condition should be very difficult to satisfy in a truly frivolous suit. If the objective probability of liability is zero, one would expect the plaintiff to have considerable difficulty finding evidence to meet the trial burden. Thus, the suit is likely to be dismissed at summary judgment, or if not, the evidence will be so slanted against liability that the risk of jury error should be rather small. To be sure, there could be some cases where $c/x$ is small enough and $q$ large enough to support PEV litigation. Perhaps some complex class action suits qualify, especially if the legal and factual complexity gives the plaintiff's attorney lots of opportunities for obfuscation. However, I doubt that this PEV theory can account for a widespread frivolous suit problem.

3. **Option Value**

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14 See, e.g., Eric Rasmussen, *Nuisance Suits*, in NEW PALGRAVE DICTIONARY OF LAW & ECONOMICS ( ).
15 If there were some plaintiffs of this type and defendants were not able to tell which type they faced, those plaintiffs motivated only by the expected monetary value of a possible settlement might pretend to be the PEV type, and the defendant ignorant of the plaintiff’s true type might settle some of the time in equilibrium. If a vindictive or principled plaintiff would not settle the suit, however, the monetarily motivated plaintiff would not be able to obtain a settlement either.
The option theory is a bit more complicated. According to this theory, lawsuits have an option value which, when added to the expected trial value (px), can make an otherwise NEV suit into a PEV suit. Professor Bradford Cornell in a 1990 article was the first to note the possibility of applying real option theory to litigation.\(^\text{16}\) Professors Peter Huang and Joseph Grundfest have developed the idea more rigorously in later work.\(^\text{17}\)

A lawsuit has an option value for the plaintiff because the plaintiff has the option to voluntarily dismiss the lawsuit at any point.\(^\text{18}\) This means that the plaintiff is able to treat litigation like an R&D project. The plaintiff can invest in increments, obtaining new information at each stage before deciding whether to continue with the suit. The key to a suit’s option value is that the plaintiff is not committed to spending the entire anticipated trial costs merely because she files suit. She can drop at any point if new information shows that trial is not cost-justified.

To illustrate, consider the following simple example.\(^\text{19}\) Suppose that before filing suit, the plaintiff estimates the likelihood of success at trial as 30%, and suppose that she estimates the likely outcome conditional on success as $2 million and estimates total litigation costs through trial as $800,000. Note that this is not a frivolous suit by my definition, but it is NEV ignoring its option value (px-c = 600,000-800,000 < 0). Now suppose that the litigation takes place in two stages: in stage 1, the parties take discovery, and in stage 2, they go to trial. Suppose that discovery perfectly reveals whether the suit is a winner or a loser at trial. This means that

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\(^{18}\) This is not exactly true in federal court. See FED. R. CIV. P. 41(a). The plaintiff can dismiss the suit unilaterally before the defendant answers or moves for summary judgment. After that, the plaintiff can dismiss if all the other parties stipulate to dismissal or if the court allows it, either of which is very likely when the plaintiff agrees to dismissal with prejudice. Problems can arise when the plaintiff seeks dismissal without prejudice. I ignore this wrinkle and assume that that any voluntary dismissal is with prejudice.

\(^{19}\) This example is a modified version of an example in Huang, *supra* note 17, at 50-51.
updated to take account of discovery results is either 0 or 1, depending on what discovery reveals.

If discovery reveals that the suit is a certain loser at trial, the plaintiff will drop the suit and avoid incurring the costs of trial. Let’s assume that total litigation costs are split equally between the two stages, so each stage costs $400,000. Because the plaintiff assigns an ex ante probability of 30% to the suit winning at trial, the plaintiff will also assign a 30% chance to discovery revealing that the suit is a certain winner. The result is that the suit is PEV when the plaintiff’s option to drop is incorporated. The plaintiff knows that she will spend $400,000 to go through stage 1. With a 30% probability, she will learn that the suit is a certain winner and choose to go through stage 2, winning $2,000,000 at trial. Otherwise, she will drop the suit after discovery. The expected value calculation, therefore, is:

\[
0.3 \times (2,000,000 - 400,000) - 400,000 = 80,000 > 0
\]

A rational, risk-neutral plaintiff will file this suit and the parties are likely to settle.

The option theory of litigation is much more complex than this, but this simple example captures the central intuition, and it also shows why the theory cannot account by itself for frivolous litigation as I have defined it. Recall that there are two ways an objectively meritless suit can be frivolous. One way is if the plaintiff files knowing that her suit is meritless. In such a case, \( p = 0 \) from an objective point of view. Since the plaintiff knows this, the plaintiff also must know that there is no chance she will learn information during the litigation that shows the suit is anything other than meritless. Therefore, the lawsuit has zero option value. Somewhat more precisely, the option value of a lawsuit is a strictly increasing function of the degree of
variance. In particular, as outcome variance increases, the value of the option to drop suit also increases. However, when the lawsuit is objectively meritless, the variance is zero, so the option value is also zero.

The second way that a suit can be frivolous is if the plaintiff files not knowing that her suit is actually meritless. In the above example, the plaintiff conducts discovery to find out if her suit has merit and she learns 30% of the time that it does and 70% of the time that it does not. But such a suit is not necessarily frivolous by my definition. It is frivolous only if the plaintiff fails to investigate when she should. The reason she fails to investigate, however, has nothing to do with her suit being PEV when its option value is included. I shall argue later that she fails to investigate because she is better off learning about her suit from the defendant's settlement offer or through discovery. In my explanation, asymmetric information, not option value, provides the additional ingredient needed to explain frivolous filings.

B. NEV Theories with Complete Information

There are three NEV models in the literature that assume both sides know that the suit is meritless. The first is based on cost asymmetry. The second focuses on how costs are distributed over the different stages of the litigation. The third is based on reputation.

1. Cost Asymmetry: The Rosenberg-Shavell Model

David Rosenberg and Steven Shavell developed one of the earliest models of frivolous litigation. In their model, information about the merits is symmetric: both the plaintiff and the

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20 See, e.g., Grundfest & Huang, supra note , at 1276.
21 Option value might be affected by variance in the risk of trial error. For example, suppose a plaintiff believes that discovery sometimes reveals evidence that can be used to confuse the jury and thereby increase the error risk at trial. Such a plaintiff might choose to conduct discovery in order to check whether such evidence is available in her case and then drop the suit if none appears. However, I am skeptical that option theory applied to error risk can account for much, if any, frivolous litigation, especially as the maximum error risk in a frivolous suit is likely to be very small.
defendant know that the lawsuit is meritless. In equilibrium, the plaintiff files suit and makes a take-it-or-leave-it demand in the amount of the defendant’s cost of responding to the complaint, and the defendant accepts the offer rather than respond. For this to be an equilibrium, the plaintiff’s cost of preparing and filing the complaint must be less than the defendant’s cost of responding. The key to this equilibrium is that the defendant must respond or suffer a default judgment, so the plaintiff need not invest any further in the litigation until after the response.

To illustrate with a numerical example, suppose that the suit is completely meritless and that it costs the plaintiff $500 to prepare and file a complaint and the defendant $1000 to prepare and file an answer to the complaint or a motion to dismiss. In the Rosenberg-Shavell model, the plaintiff first decides whether to file suit. If the plaintiff files, she makes a settlement demand and the defendant decides whether to accept or reject. Solving the model by backward induction, we know that if the plaintiff files, the defendant will be willing to accept any demand up to $1000. By doing nothing, the defendant suffers a default judgment greatly in excess of $1000. The only other alternative is to file an answer or a motion, each of which is more costly than paying a settlement up to $1000. The plaintiff anticipates the defendant’s response, so if she files suit, she makes a settlement demand of $1000 and the defendant accepts the demand. Finally, since it costs her $500 to file suit, she will file since she knows that if she does so, she will receive a $1000 settlement, netting her a gain of $500.

This model cannot account for a pervasive frivolous suit problem for reasons I have explained elsewhere.\textsuperscript{23} Rosenberg and Shavell do not specify the nature of defendant’s response, but they assume that it is the first response the defendant must make or suffer a default judgment.

\textsuperscript{21} See Bone, supra note **, at 537-541.
This occurs at the pleading stage and involves filing an answer or a motion to dismiss. However, even with a take-it-or-leave-it bargaining protocol, the amount of any settlement is capped by the cost of answering or filing a motion, both of which are very small. Thus, the model cannot predict substantial frivolous suit settlements.

Moreover, the plaintiff will file suit only if the defendant’s cost of answering or filing a motion exceeds the plaintiff’s cost of preparing and filing a complaint. But there is no reason to believe that this condition holds generally. Indeed, the cost of answering is likely in many cases to be less than the cost of preparing and filing a complaint, especially when the defendant knows the suit is frivolous. Finally, a repeat-play defendant has an incentive to refuse to settle in order to develop a reputation for fighting frivolous suits when the long run benefits of deterring frivolous filings (discounted to present value) exceed the short term costs of litigating.24

2. Cost Distribution: The Bebchuk Model

Professor Lucian Bebchuk has proposed an important sunk-cost model of NEV litigation. In the Bebchuk model, a lawsuit is divided into distinct stages and parties sink part of their litigation costs at each stage. If total litigation costs are distributed across the stages so that no single stage has too much of the total cost and the plaintiff’s costs are sufficiently in line with the defendant’s at each stage, the plaintiff with an NEV suit at the time of filing will sue and obtain a sizable settlement. A critical condition is that suit must be PEV at the penultimate stage, after the plaintiff has sunk a substantial fraction of its total costs in the earlier stages.

The model is solved by backward induction. Suppose the lawsuit has N stages and the final stage is trial. Consider what will happen if the parties ever find themselves on the eve of

24 Thomas Miceli has modeled the reputation game. Thomas J. Miceli, Optimal Deterrence of Nuisance Suits by Repeat Defendants, 13 INT’L REV. L. & ECON. 135 (1993). Miceli also analyzes this strategy for cases where the plaintiff has private information about the merits. See infra notes **.
trial. If the suit is PEV at that point, the plaintiff can make a credible threat to take the suit to trial, so the defendant should be willing to settle. Suppose the parties would settle for $S_N$ on the eve of trial. Now consider what will happen one stage back; i.e., when the parties are about to enter the N-1(penultimate) stage. The plaintiff knows that if she proceeds, she will obtain a settlement of $S_N$. Therefore she should be willing to invest in the penultimate stage as long as the costs she incurs are less than $S_N$. If this condition is satisfied, she has a credible threat to litigate the penultimate stage, so the defendant should be willing to settle for $S_{N-1}$. This logic continues for each stage moving backward from trial until the pleading stage is reached—assuming that the plaintiff’s cost for each stage is less than the anticipated settlement just after that stage is complete. Thus, the parties always settle shortly after the complaint is filed, and for a substantial sum.

To illustrate with a concrete example, assume that both parties know that the likelihood of success at trial is 30% and that the expected trial award conditional on success is $100,000. Suppose that the plaintiff’s and the defendant’s total expected litigation cost is $40,000 for each. Finally, suppose the parties incur costs in four stages—the pleading stage, the discovery stage, the pretrial planning stage, and the trial—and that each party spends $10,000 at each stage. Proceeding by backward induction, first consider what would happen if the parties reached the eve of trial. At this point, each side would have sunk $30,000 and each would anticipate spending $10,000 on trial. Thus, trial is PEV for the plaintiff because the expected value of trying the case from this point on is: $0.3 \times 100,000 - 10,000 = 20,000$. Since the plaintiff has a

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25 Let $c_p$ be plaintiff’s total litigation costs through trial and $c_d$ be defendant’s total litigation costs. The equilibrium settlement in the Bebchuk model is: $S^* = px + (c_d - c_p)/2$. 
credible threat to go to trial, the defendant should be willing to settle, and assuming equal bargaining power, the parties should settle for $30,000.26

Next move back one stage to the point where the plaintiff is deciding whether to take the case through the pretrial planning stage. The plaintiff knows that she will receive a settlement of $30,000 if she does so. Because the pretrial planning stage costs her $10,000, she can credibly threaten to proceed. As a result, the parties should settle for $30,000, again assuming equal bargaining power. The same logic applies at the discovery stage and also at the pleading stage. Therefore, the parties should settle for $30,000 at the very beginning of the suit, just after the complaint is filed, even though the suit is NEV at this point.

This model predicts much larger settlements than the Rosenberg-Shavell model, but it does so mostly for meritorious suits that are NEV. If suit is meritless and p=0, there is no stage where the suit becomes PEV. It is possible that the risk of trial error could make suit PEV at some late stage, but if trial error is very small, as would be expected for a meritless suit, total litigation costs would have to be sliced very finely.27 Moreover, the suit would also have to survive summary judgment, which seems unlikely for a truly meritless suit.

Bebchuk’s model can account for meritless suits if the litigation has a cost-free stage for the plaintiff. A cost-free stage is a stage in which the plaintiff need spend nothing when the defendant must spend something. With a cost-free stage, the defendant is willing to settle for an amount equal to what he must spend at that stage. Therefore, by backward induction, he will

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26 Bebchuk assumes that the plaintiff and the defendant are equally likely to make take-it-or-leave-it offers at each stage, but this is equivalent to assuming equal bargaining power.

27 Theoretically, it is possible to divide litigation up into as many stages as one would like. However, as a practical matter, the defendant will probably be unwilling to settle a frivolous suit when trial is virtually complete. This is not strictly an implication of the Bebchuk model, but it makes sense if one assumes that the defendant values vindication and anticipates obtaining it in the immediate future (one can formalize this by incorporating a discount rate into the model).
settle at the beginning of the suit, provided that the costs of earlier stages are small enough. In fact, this is why the Rosenberg-Shavell model works: the stage where the defendant responds to the complaint is a cost-free stage for the plaintiff. \footnote{The Rosenberg-Shavell model, therefore, includes the Rosenberg-Shavell model as a special case.} The problem, however, is that there are not likely to be any other cost-free stages later in the suit. Litigation is not a tennis match. After the initial pleading stage, the parties are likely to invest concurrently rather than sequentially. Thus, the Bebchuk model does little better than the Rosenberg-Shavell model in predicting a serious frivolous suit problem. \footnote{Some scholars have analyzed how contingency fee arrangements might support frivolous litigation. See Zhiqi Chen, \textit{Nuisance Suits and Contingency Attorney Fees}, 2 REV. LAW & ECON. 363 (2006). Chen’s model, for example, is actually an extreme version of the Bebchuk model. By entering into a contingency fee arrangement, the plaintiff, in effect, sinks all her costs before filing suit. Since the rest of the litigation is costless to her, she has a credible threat to go to trial independent of how costs are spread over different stages. The model assumes that the plaintiff makes all the litigation decisions and it shows that in equilibrium attorneys are willing to enter into these arrangements. There is a problem, however. While the client is supposed to control settlement decisions, the attorney exercises most of the control in contingency fee cases. In the model’s equilibrium, attorneys are willing to cede this control to plaintiffs. However, the problem is how to force the attorney to stick with her ex ante commitment ex post, when the defendant rejects an offer and the attorney must decide whether to drop or litigate further.} Moreover, the Bebchuk model breaks down when information about the merits is asymmetric. Professor Alon Klement has shown that the defendant can sometimes deter NEV suits when the defendant has private information about liability. In his model, the defendant rejects the plaintiff’s settlement demand over successive stages and each rejection gives the plaintiff more information about the merits. As a result, the plaintiff updates her beliefs at each stage and assigns a lower probability to the defendant’s being liable. Under certain conditions, the plaintiff will eventually lose any credible threat to proceed to the next stage, and the Bebchuk equilibrium unravels all the way back to the beginning. Therefore, the plaintiff will not sue. \footnote{The Bebchuk model has received considerable attention in the literature, and scholars have pointed out other problems with it. For example, Warren Schwartz and Abe Wickegren show that the model is very sensitive to the structure of the settlement bargaining subgame. Warren F. Schwartz & Abraham L. Wickegren, \textit{Advantage Defendant: Why Sinking Litigation Costs Makes Negative-Expected-Value Defenses but Not Negative-Expected-}
3. **Reputation – The Farmer-Pecorino Model**

Amy Farmer and Paul Pecorino have developed a reputation model that they claim explains truly frivolous filings. In their model, plaintiffs pay only the filing cost and enter into contingency fee arrangements in which their attorney pays for the rest of the litigation in return for a fraction of any recovery. The attorney controls all the litigation decisions (the model actually assumes that the attorney and client are a single agent). Finally, the attorney expects to have many suits over an infinite time horizon, so litigation is modeled as an indefinitely repeated game. In equilibrium, some attorneys, as repeat players, develop a reputation for taking frivolous suits to trial and are therefore able to make credible threats that induce the defendant’s acceptance of their take-it-or-leave-it offers.

This is a useful model, but there is a serious question about how much of frivolous litigation it can explain. For the plaintiff’s litigation decisions to create a reputation, other attorneys must interpret the decision accurately. This means that they must somehow know that the plaintiff’s lawyer knows her suit is frivolous and decides to litigate through trial nevertheless, and this information might be difficult to obtain. Moreover, decisions to litigate can be motivated by many reasons other than trying to build a reputation, so the signal is likely to be noisy. Furthermore, the plaintiff’s attorney must be willing to incur the costs of developing a reputation by taking losing cases to trial in the short run. Finally, if reputation is a major reason for frivolous litigation, one would expect that most frivolous suits would be brought by attorneys

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Value Suits Credible, 38 J. LEG. STUD. 235 (2009). In particular, Bebchuk’s sunk-cost result does not hold quite as neatly when the parties bargain according to a more realistic alternating-offer game rather than Bebchuk’s take-it-or-leave-it protocol.


Although as they point out, id. at 136, it is possible to generate a similar equilibrium with a finite horizon by constructing a Kreps-type reputation game.
with bad reputations. Whether this is so is ultimately an empirical question, but at first glance it 
does not strike me as obviously true.

C. NEV Suits With Incomplete Information

In cases of asymmetric information about the merits, either the plaintiff or the defendant 
has the private information. The former information structure has been ably analyzed by Avery 
Katz in a 1990 article. But the latter has received little attention.

1. Plaintiff Knows and Defendant Does Not: Strike Suits

In the discrete version of Katz’s strike suit model, suits are either meritorious or 
meritless. Meritless suits have a zero chance of success at trial, and meritorious suits win with 
probability \( p > 0 \). The plaintiff knows whether her suit is meritorious or meritless, but the 
defendant knows only the background probability that suits are meritorious (let us call that 
probability \( r \)).

The model has four stages. In the first, nature distributes suits between meritorious and 
meritless. The background probability a suit is meritorious is \( r \). In the second stage, a plaintiff 
decides whether to file suit. In the third, the defendant decides whether to make a take-it-or-
leave-it settlement offer and in what amount. In the fourth stage, the plaintiff decides whether to 
accept the offer if one is made. If the plaintiff rejects a strictly positive offer or if no offer is 
forthcoming (i.e., the defendant refuses to settle), the plaintiff decides whether to drop or go to 
trial. At trial, the plaintiff receives an award of \( x \) with probability \( p \) in a meritorious suit and 
receives nothing in a meritless suit.

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34 In the following discussion, I convert Katz’s notation into the notation I use for the investigation model later in this Article. This better facilitates comparison.
The cost of filing is $c_F$. The plaintiff’s total cost of litigating to trial after filing is $c_T$ and the defendant’s cost is $d_T$. Therefore if the plaintiff rejects the settlement offer and goes to trial, the defendant incurs a cost of $px + d_T$ in a meritorious suit and $d_T$ in a meritless suit.

In this model, the defendant’s choice of settlement offer involves a tradeoff between the cost of overpaying frivolous plaintiffs (who will accept any offer but who would drop if the defendant refused to settle) and the cost of going to trial when the suit is meritorious (which would happen if the defendant refused to settle). In equilibrium, the defendant chooses between two options: either he refuses to settle or he makes an offer that a legitimate plaintiff would accept. Anything in between is accepted only by frivolous plaintiffs, and the defendant knows that frivolous plaintiffs will drop if he refuses to settle. In addition, the defendant cannot refuse to settle all the time because this strategy does not support a Nash equilibrium. If the defendant refused to settle all the time, no frivolous plaintiffs would ever file and therefore all suits would be meritorious. But in that case, the defendant would switch to always offering a settlement equal to the expected value of a meritorious suit in order to avoid trial costs.\footnote{And then all frivolous plaintiffs would file suit.}

There are two different equilibria in this model depending on the prior fraction of meritorious suits ($r$). What Katz calls the “restricted entry equilibrium” holds when the fraction of meritorious suits is large enough – i.e., when $r > (px - c_D - c_T)/(px + d)$. When $r$ is large so that most cases are meritorious, the defendant’s optimal strategy in equilibrium is to offer $S = px - c_D - c_T$ to all plaintiffs. Doing this saves trial costs in meritorious suits. It also attracts all meritless suits and makes the defendant overpay in each. But there are not many meritless suits when $r$ is
large, so the expected savings in trial costs exceed the expected costs of overpaying frivolous plaintiffs.

Katz calls the other equilibrium the "competitive equilibrium." The competitive equilibrium holds when the fraction of meritorious suits is small enough – i.e., when $r < (px-c_D-c_T)/(px+d)$. In the competitive equilibrium, there are enough meritless suits that it is not optimal for the defendant to make an offer of $px-c_D-c_T$ in all cases (the high offer). Since always refusing to settle cannot support an equilibrium, the defendant uses a mixed strategy and randomizes between refusing to settle and making the high offer. In effect, the defendant tries to deter some frivolous plaintiffs by refusing to settle some of the time. The result, however, is that he must go to trial when he refuses to settle a suit that turns out to be meritorious.

In this equilibrium, frivolous plaintiffs file suit at the rate of $q = r(c_D+c_T+d)/(1-r)(px-c_D-c_T)$ and defendants offer to settle for $px-c_D-c_T$ at the rate of $\sigma = c_T/(px-c_D-c_T)$. Therefore, some frivolous plaintiffs sue and receive a high settlement, and some meritorious suits go to trial that would have settled if the threat of frivolous suits was absent.

The Katz model is useful.\textsuperscript{36} I have described it in some detail because I use it as a comparison later in this Article. However, it addresses only the case where the plaintiff knows suit is meritless and the defendant does not. This covers only part, and not that large a part, of the litigation landscape. Many cases with asymmetric information involve the reverse asymmetry. For example, in the Twombly and Iqbal cases, it was the defendant who had private information about conspiracy or intent, and the plaintiff did not know for sure whether the suit was meritorious.

\textsuperscript{36} However, other scholars have noted limitations. For example, Miceli shows how defendants can deter frivolous suits in the Katz model when they are players in a repeated game. Miceli, supra note **.
2. **Defendant Knows and Plaintiff Does Not**

Ivan Png and Barry Nalebuff have studied aspects of the reverse asymmetry, where defendants know the merits but plaintiffs do not. However, Png treats frivolous suits by making the background probability of a legitimate suit approach zero in the limit, which has the effect of making information almost complete.\(^{37}\) Moreover, Png's Nash equilibrium in which frivolous plaintiffs sue and obtain settlements is not subgame perfect.\(^{38}\)

Nalebuff's model is more promising.\(^{39}\) It assumes that defendant has private information about liability and that plaintiff makes a take-it-or-leave-it settlement demand after filing suit. Plaintiff can drop or go to trial if his demand is rejected. Nalebuff shows that under plausible conditions a plaintiff with a meritless case will sometimes make a high settlement demand that forces trial. The reason is that plaintiff must maintain a credible threat to go to trial in case defendant rejects his demand, and to do this, plaintiff must remain relatively ignorant of the merits after the settlement stage. The problem is that plaintiff learns something about the merits from defendant's response. Thus, plaintiff inflates his demand to dilute the signal, and this ends up forcing some cases to trial that would have otherwise settled.

Although the Nalebuff model is helpful, it does not address meritless litigation or the frivolous suit problem directly. Nalebuff's concern is not with frivolous litigation in particular, but with settlement more generally, and his assumption of plaintiff uncertainty about liability, while plausible in general, is somewhat problematic for meritless suits. What the model needs is

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\(^{38}\) This is the equilibrium of Png's model in which plaintiff files suit; plaintiff accepts defendant's settlement offer if one is made and otherwise goes to trial, and defendant always offers a strictly positive settlement no matter what type he is. *Id.* at 548. As others have pointed out, see, e.g., Katz, *supra* note **, at 4 n.2, plaintiff's threat to go to trial in the event she does not receive an offer is not credible when plaintiff's suit is NEV.

an explanation of why plaintiffs do not investigate before filing. In a medical malpractice case, for example, the patient will often be able to learn a great deal about his case by consulting an expert before suing. To be sure, the defendant doctor is frequently the only one who knows what actually happened. But in many cases, an independent expert who examines the plaintiff and his medical history should be able to tell whether physician negligence could have caused the injury and even estimate the likelihood it did. Furthermore, Nalebuff does not address the question of when meritless suits should be considered “frivolous” because of an unreasonable failure to investigate. Obviously plaintiffs will not investigate when the expense is extremely high, but in those circumstances a failure to investigate is not likely to be considered unreasonable or the ensuing lawsuit considered frivolous.

The investigation model I describe and solve in this Article builds on the Nalebuff model and on the considerable literature on settlement bargaining under asymmetric information. It explains a plaintiff’s decision not to investigate before filing even when the cost of investigating is moderate, an investigation perfectly reveals suit type, and meritless suits always lose a trial and never receive a positive settlement offer. In the partial pooling equilibrium that most clearly supports the label of frivolous suit, some meritless suits are filed, some meritorious suits go to trial rather than settle, and some meritorious suits obtain no recovery at all.

Before analyzing this model, however, it is important to take note of one more theory of frivolous litigation that departs from the rational choice assumptions underlying all the models to this point.

C. Bounded Rationality

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40 Cites.
The bounded rationality explanation relies on results from framing theory that show that individuals who face low probability gains tend to be risk-seeking and individuals who face low probability losses tend to be risk-averse.\textsuperscript{41} Because frivolous suits present plaintiffs with low probability gains, these plaintiffs are likely to be risk-seeking, and risk-seeking plaintiffs should be more willing to choose a risky trial over a certain settlement. Similarly, defendants face low probability losses in frivolous suits, so they should be risk-averse and thus eager to settle. The resulting asymmetry of risk preferences favors the plaintiff and might produce settlement in a frivolous suit.

This account makes the same questionable assumptions that all bounded rationality accounts of litigation behavior make. First, it assumes that attorneys suffer from as serious bounded rationality constraints as their clients. There is no doubt that lawyers are subject to cognitive limitations just as everyone else is, but the question is one of degree. Lawyers are experienced with risky litigation and trained to think analytically and strategically about litigation choices, and as a result, they might be less susceptible to cognitive bias.\textsuperscript{42} Second, the bounded rationality explanation assumes that the framing effect has a substantial enough impact on risk preferences to support credible litigation threats and thus induce settlement. I am not aware of any studies that measure the magnitude of this effect in the litigation setting, and I am skeptical that the impact is very substantial. Nevertheless, bounded rationality might be part of the frivolous suit story even if it cannot carry the full weight of explanation.

II. The Investigation Model

\textsuperscript{42} Cite to studies confirming this.
The investigation model I present here is a discrete model. There are only two types of suit – meritorious and meritless – and all meritorious suits have the same probability of success, expected trial award, and costs. In addition, plaintiffs choose either to investigate or not to investigate when investigation is costly. Investigation cost is exogenously specified, and if the plaintiff incurs the cost, she always learns what type of suit she has.

A. Formal Notation

The model uses the following notation:

r - The background proportion of legitimate suits. 1-r is the background proportion of meritless suits.

p - The probability that a legitimate suit will win on liability at trial. 0 < p \leq 1.

x - The expected trial award for a legitimate suit conditional on winning liability. x > 0.

c_F, c_D, c_T - The cost of filing suit, litigating from the filing stage through discovery, and litigating from the discovery stage through trial, respectively, for a plaintiff who does not investigate.

c - A non-investigating plaintiff’s total litigation costs. c = c_F + c_D + c_T.

b - The non-recoupable portion of the cost of an investigation that perfectly reveals suit type; i.e., the portion that does not reflect savings at any other stage of the litigation.

z - The portion of the investigation cost that is recouped at the discovery stage, i.e., the portion that reflects a cost shift from discovery to prefiling investigation. Thus, the cost of discovery for a plaintiff who investigates is c_D - z rather than c_D.

d_D, d_T - The defendant’s costs of litigating the case through discovery, and from the discovery stage through trial, respectively. I assume that d_T > 0 and that d_D > c_F.

d - Defendant’s total litigation costs; i.e., d = d_D + d_T.

B. Description of the Model
The model has a single plaintiff and a single defendant and both parties are assumed to be risk-neutral. A meritorious suit has an expected trial award of $p_x$. In a meritless suit, $p = 0$. The defendant knows suit type but the plaintiff knows only the background probability that suits like hers are meritorious ($r$) or meritless ($1-r$). Moreover, the model assumes that the defendant cannot communicate its knowledge of suit type to the plaintiff in a credible way before filing. Finally, the defendant cannot directly observe whether the plaintiff has investigated.

The model has seven stages:

1. Nature randomly sorts suits between meritorious and meritless with $r$ being the probability a suit is meritorious.

2. The plaintiff decides whether to investigate. An investigation is costly ($b+z$), but it perfectly reveals suit type.

3. Whether or not she investigates, the plaintiff decides whether to file suit. It costs the plaintiff $c_F$ to file, and a plaintiff who knows her suit is meritorious always file; i.e., $p_x-c > 0$.

4. If the plaintiff files suit, the defendant decides whether to make a take-it-or-leave-it settlement offer, $S$. The defendant can make an offer for any amount greater than 0, or he can offer $S=0$, which in the model is equivalent to refusing to settle. When defendant decides on $S$, he knows whether the suit is meritorious or meritless, but the only knowledge he has of whether the plaintiff investigated is what he can infer from the plaintiff’s filing decision.

5. The plaintiff decides whether to accept or reject $S$. I assume that bargaining costs are zero.

6. If the plaintiff rejects, she must decide whether to litigate further or drop. If she chooses to litigate further, the suit goes through discovery. I assume that discovery perfectly reveals suit type, so the plaintiff learns what type of suit she has at this point. Discovery costs the plaintiff $c_D-z$ if she has investigated or $c_D$ if she has not, and it costs the defendant $d_D$.

7. After discovery, the plaintiff chooses whether to go to trial or to drop. If she decides to go to trial, it costs her $c_T$ and it costs the defendant $d_T$. If the plaintiff has a meritorious suit, her expected trial award conditional on proving liability is $p_x$, and if the plaintiff has a meritless suit, it is zero.
I assume that a prefiling investigation saves some costs at the discovery stage, so a portion \((z)\) of the amount spent on investigation is recouped later in the litigation. The rest of the investigation cost \((b)\) is nonrecoupable. Therefore, total investigation cost is \(b+z\), and I assume \(b+z>0\).\(^ {43}\) It also seems reasonable to suppose that \(b\) is much larger than \(z\), and that \(z\) represents only a small fraction of total discovery costs. Prefiling investigation is likely to be a more expensive method of obtaining information than discovery, because the plaintiff cannot compel the defendant’s cooperation before filing suit. Furthermore, the plaintiff will usually make the same first-wave document requests and take the same depositions whether or not he investigates and he will also spend about the same amount of time wading through defendant’s document production and other discovery disclosures. If prefiling investigation saves anything at the discovery stage, it is likely to do so only for second-wave discovery.

All these assumptions and the values of all the variables are common knowledge in the game. This is a signaling game with incomplete and imperfect information, and we solve for a Perfect Bayesian Equilibrium. An equilibrium in this model is a pair of strategies, one for the plaintiff and one for the defendant, and a set of beliefs, that are sequentially rational in the sense that the specified strategies are optimal for players who hold the equilibrium beliefs at every point in the game and the beliefs are confirmed when the players play the specified strategies.

Appendix A diagrams the model in extensive form.

III. Equilibrium Strategies

A. The Intuition

\(^{43}\) This allows for the two special cases, \(z=0\) and \(b=0\).
The plaintiff wants to find out what kind of suit he has. If he knows his suit is meritless, he can drop and save litigation costs. If he knows his suit has merit, however, he can be sure to get at least the reservation price of a meritorious suit. Plaintiff has three ways to learn suit type: he can find out himself by investigating before filing; he can file and hope that defendants signal by making different offers in meritless and meritorious suits, or he can file and litigate through discovery. Each alternative is costly, and plaintiff compares the costs when determining his best strategy.

Defendant has opposing incentives. Defendant wants plaintiff to know the truth when suit is meritless but not when suit is meritorious. As a result, defendant tries to pool in meritorious suits by making the same offer he would make if suit were meritless. Plaintiff anticipates this and responds by relying less on the offer to signal suit type and more on investigation or discovery, whichever is cheaper. Defendant in turn anticipates plaintiff’s response and so expects to go to trial some of the time. In order to minimize the trial loss, defendant sometimes separates by making an attractive offer that plaintiff accepts.

To illustrate, consider the following medical malpractice hypothetical in which plaintiff worries that his dizzy spells might have been caused by negligent surgery. Only the defendant knows for sure what actually happened, but plaintiff (or more properly, his attorney) estimates a 0.5 probability that his suit has merit (r=0.5). In other words, he estimates that dizzy symptoms like his are caused by negligent surgery 50% of the time. Assume that meritorious cases win at trial with probability 0.6 on average (p=0.6), and that when they win, the expected trial award is $150,000 (x=150,000).
To simplify the analysis, also assume that investigation saves nothing at the discovery state (\( z=0 \)). And finally, assume that the filing cost is $1000 (\( c_F = 1000 \)); discovery costs each side $10,000 (\( c_D = d_D = 10,000 \)), and trial costs each side $10,000 (\( c_T = d_T = 10,000 \)). With these assumptions, the expected value of litigating the case all the way through trial for an uninformed plaintiff is \( 0.5 \times (0.6 \times 150,000 - 21,000) - 11,000 = 29,000 \), so plaintiffs always sue when they do not investigate.\(^{44}\)

For the first scenario, suppose that it is very inexpensive to investigate: in particular, plaintiff can find out whether his suit is meritless by spending $200 to consult a specialist (\( b=200 \)). Will plaintiff investigate? The answer is yes. Plaintiff has two alternatives to learn suit type aside from investigating; he can hope for a signal from defendant’s settlement offer, or he can conduct discovery. Consider the first alternative. Even if defendants separate completely, so offers perfectly signal suit type, plaintiff must still spend $1000 to file suit, an amount he saves by investigating when suit turns out to be meritless. Therefore, the $200 spent on investigation saves the expected cost of filing a meritless suit, which is \( 0.5 \times 1000 = 500 \). So plaintiff is better off investigating. The second alternative, discovery, is even more expensive, so plaintiffs always investigate before filing.

Anticipating this strategy, the defendant expects plaintiff to be informed and so offers $70,000 in a meritorious suit and 0 in a meritless suit (i.e., refuses to settle), and plaintiff accepts both offers (i.e., drops when defendant refuses to settle). Thus, defendants do in fact

\(^{44}\) Recall that a plaintiff with a meritless suit learns that her suit is meritless after discovery and will drop the suit at that point rather than go to trial. Therefore, the expected cost of litigating a meritless suit is the cost of filing plus the cost of discovery. The suit would also be positive expected value if the plaintiff took all suits to trial, for then the expected value would be: \( 0.5 \times (0.6 \times 150,000) - 21,000 = 24,000 \).
send a perfect signal of suit type by separating completely. The result is that all plaintiffs
investigate, only meritorious suits are filed, and all such suits settle for $70,000.

Now suppose instead that investigation costs are extremely high; assume, for example,
that plaintiff must spend $8000 to learn whether his case has merit (i.e., b=$8000). Perhaps at
the extreme plaintiff has to bribe hospital personnel to divulge confidential records or report on
what they saw or heard during surgery. Will plaintiff investigate? The answer is no. Discovery
always reveals suit type, so the most an investigation can save is the cost of filing and discovery
in a meritless suits, which is $5500. Because this is less than the cost of
investigating, plaintiff always prefers to litigate rather than investigate.

However, plaintiffs do not conduct discovery all the time because they also learn
something from defendants’ offer. To see why, first note that a pooling offer can never exceed
$10,000 because that is the most a defendant is willing to offer in a meritless suit (recall that
plaintiffs always drop meritless suits after discovery). Now suppose that defendants always
pool, so plaintiffs learned nothing from the offer. In that case, plaintiffs would use the prior of
0.5 to calculate a $30,000 expected trial value at the settlement stage (since filing cost is sunk),
and so would demand at least this much to settle.\textsuperscript{45} But since this minimum demand is greater
than the maximum pooling offer ($10,000), plaintiffs would always reject any pure pooling
offer, and defendants in meritorious suits would always end up going to trial if they tried to pool
completely. Thus, defendants do better making separating offers (of $70,000) some of the time.
Moreover, separation strengthens the signal conveyed by the pooling offer, so plaintiffs will not
reject the pooling offer all the time.

\textsuperscript{45} When plaintiffs never investigate, they all sue because the expected value of suit given the fact that the plaintiff
drops a meritless suit after discovery is $29,000. After filing suit, the expected value of going to trial is:
$0.5 \times (0.6 \times 150,000 - 20,000) - 0.5 \times 10,000 = $30,000.$
In other words, plaintiffs end up learning suit type by combining two of their options: discovery and signaling. As they reject the pooling offer more frequently in order to learn through discovery, they also force defendants to separate more frequently and the sharper the separation the more plaintiffs learn from a pooling offer. The optimal strategy is for plaintiffs to reject enough of the time to force separation to the point where the combination of discovery and signaling provides full information about suit type in expectation.

As a result, plaintiffs never investigate and always sue; defendants offer $70,000 sometimes but not always in meritorious suits and always refuse to settle meritless suits, and plaintiffs sometimes drop and sometimes litigate further when the defendant refuses to settle. The upshot is that all suits are filed; some meritorious suits go to trial and some settle, and some meritless suits go through discovery before being dropped.

Finally, consider the intermediate scenario, in which investigation costs are moderate, say $2000 (b=$2000). From the previous analysis, we know that plaintiffs will always prefer to investigate rather than rely on discovery. Investigation costs $2000 but yields an expected savings of $5500 (the expected cost of filing and discovery for meritless suits). This means that plaintiffs never conduct discovery to learn suit type; instead they rely on a combination of investigation and signaling. At the same time, however, plaintiffs do not investigate all the time, because they also learn something about suit type from defendant’s offer.

As they increase the rate of investigation, plaintiffs induce defendants in meritorious suits to make separating offers (of $70,000) more frequently in order to minimize the potential trial loss. And as defendants separate more frequently, the pooling offer sends a stronger signal of meritless litigation, so plaintiff’s marginal gain from investigating decreases. In equilibrium,
plaintiffs investigate frequently enough to force defendants to separate to a point where investigation and signaling combined give plaintiffs full information about suit type in expectation.

In this third scenario, where investigation costs are moderate, plaintiffs investigate sometimes but not always and they always accept a pooling offer when they do not investigate. Moreover, defendants offer $70,000 sometimes and make a pooling offer the rest of the time in meritorious cases. As a result, some meritless suits are filed. Furthermore, some meritorious suits settle for $70,000; some settle for the low pooling offer, and some go to trial.

B. Formal Solution

We can solve the model formally by backward induction. This yields several different equilibria (ignoring knife-edge equilibria), depending on $r$, the prior probability that suit is meritorious, and $b$, the nonrecoupable portion of investigation cost.\footnote{For simplicity, I assume that a meritless plaintiff cannot extract a small settlement from defendant in the complete-information continuation subgame starting at whatever point plaintiff learns suit lacks merit. In other words, I abstract from the strategic dynamics for complete information games analyzed in Rosenberg & Shavell, supra note and Bebchuk, supra note. It is easy to add this element to the game by truncating the meritless suit branch at the node immediately following discovery and substituting and expected payoff from settlement. However, doing this does not change the results markedly, provided the complete-information settlement is not too large.}

1. Separating Equilibrium

In a separating equilibrium, plaintiffs always investigate, and when plaintiffs sue, defendants believing that all plaintiffs are informed act in the continuation subgame as they would in a complete information game: they offer $px-c_D-c_T+z$ in a meritorious suit and $0$ (i.e., refuse to settle) in a meritless suit. (Recall that $z$ of investigation cost is saved at the discovery stage.) Two constraints must be satisfied to support this equilibrium: first, plaintiffs must do better investigating than simply filing even when they expect defendants to make separating
offers all the time, and second, plaintiffs must do better investigating than not suing at all when
they expect defendants to make separating offers. Thus, we have the following result.47

**PROPOSITION I: Separating Equilibrium**

When \( r < c_F/(p_X-c_D-c_I+z) \) and \( b < r(p_X-c) -(1-r)z \) or \( r > c_F/(p_X-c_D-c_I+z) \) and \( b < (1-r)c_F-z \), there is a separating equilibrium in which:

- Plaintiffs always investigate.
- Plaintiffs with meritorious suits file suit and plaintiffs with meritless suits do not.
- Defendants always offer \( px-c_D-c_I+z \).
- All plaintiffs who file suit accept.
- If a meritless suit is ever filed, defendants offer 0 (refuse to settle) and plaintiffs accept (drop).

When \( b > r(p_X-c) -(1-r)z \), no plaintiffs ever investigate and none sue if they are required to investigate before filing.

**Proof:**

When defendants make separating offers, the offer signals suit type, so plaintiffs with meritless suits drop after filing. Therefore, the expected value of filing without investigating is \( r(p_X-c_D-c_I+z)-c_F \). Moreover, the expected value of filing with investigating is \( r(p_X-c+z)-b-z \), since the plaintiff spends \( b+z \) investigating and files only if she learns her suit is meritorious. Accordingly, for plaintiffs to always investigate when they know defendants will make separating offers, it must be the case that \( r(p_X-c+z)-b-z > r(p_X-c_D-c_I+z)-c_F \). Solving for \( b \), we get \( b < (1-r)c_F-z \). To support a separating equilibrium, it must also be the case that plaintiffs do better investigating than not suing at all. Thus, \( r(p_X-c+z)-b-z > 0 \); i.e., \( b < r(p_X-c) -(1-r)z \). Since both constraints must hold, there are two possibilities. First, if \( r(p_X-c) -(1-r)z < (1-r)c_F-z \), then the equilibrium holds if \( b < r(p_X-c) -(1-r)z \). Second, if \( (1-r)c_F-z < r(p_X-c) -(1-r)z \), then the equilibrium holds if \( b < (1-r)c_F-z \). The proposition follows from the fact that \( r(p_X-c) -(1-r)z < (1-r)c_F-z \) when \( r < c_F/(p_X-c_D-c_I+z) \). The upper bound on \( b \) follows from the fact that the expected value of investigating must be positive in the best case scenario, where the defendant always makes the high offer in a meritorious suit.

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47 Throughout the following analysis, equilibrium conditions on \( r \) and \( b \) are expressed as strict inequalities. This ignores those cases in which \( r \) and \( b \), or both, just equal the critical thresholds. In many of these situations, equality of payoffs means that plaintiffs should be willing to randomize at any probability, and this generates knife-edge equilibria. However, these special cases add nothing important to the analysis.
Proposition I simply states that plaintiffs will always investigate in equilibrium when investigation costs are low enough and will never investigate when investigation costs are too high. The cutoff points depend on plaintiff’s beliefs about the probability her suit is meritorious. When she believes her suit is very likely to be meritless (i.e., \( r \) is very small), she is not willing to spend much on investigating since she knows it is very likely she will learn her suit is meritless and thus lose her investment. As the likelihood that suit is meritless declines (i.e., \( r \) increases) she is willing to spend more on investigating because she expects a greater return from her investment.

2. Pure Pooling Equilibrium

In a pure pooling equilibrium, defendants make the same (pooling) offer in all suits, meritless and meritorious alike. For this to be the case, plaintiffs must never investigate and must always accept the pooling offer. For if plaintiffs investigated or rejected, even sometimes, defendants would separate sometimes in meritorious suits in order to reduce the risk of loss from trial.

Therefore, there are three constraints that must be satisfied in a pooling equilibrium: first, plaintiffs must never investigate and always sue; second, defendants must be willing to make a pure pooling offer when they know plaintiffs never investigate, and third, plaintiffs must be willing to accept the offer when they have not investigated and know defendants pool completely. Satisfying these constraints yields the following result.\(^{48}\)

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\(^{48}\) This equilibrium is supported by assigning beliefs off the equilibrium path as follows. If plaintiffs ever receive an offer less than \( r(px-c_T)-c_p \), or greater than \( r(px-c_T)-c_p \) but not exceeding \( d_p \), they assume the offer could be made in either a meritorious or meritless suit and use their priors to assign beliefs. Therefore, they reject in the first case and accept in the second. If plaintiffs ever receive an offer greater than \( d_p \), they infer that their suit is meritorious since no defendant ever benefits from offering more than \( d_p \) in a meritless case. Therefore, plaintiffs reject unless the offer is at least \( px-c_T-c_T \) and accept otherwise.
PROPOSITION II: Pure Pooling Equilibrium

When \((c_F + c_D)/(p x - c_F) \leq r \leq (c_D + d_D)/(p x - c_T)\) and \(b > (1-r)(c_F + c_D - z)\), there is a pure pooling equilibrium in which:

- Plaintiffs never investigate and always sue.
- Defendants always offer \(r(p x - c_T) - c_D\) in both meritorious and meritless suits.
- Plaintiffs always accept.

*Proof:*

Consider the three constraints in reverse order:

1. For plaintiffs to be willing to accept a pure pooling offer, they must do better accepting than rejecting given their beliefs. Since they learn nothing about suit type from a pooling offer and always drop after discovery if suit turns out to be meritless, the expected value of rejecting the offer is \(r(p x - c_T) - c_D\). It follows that the plaintiff will accept any \(S \geq r(p x - c_T) - c_D\).

2. Thus, a defendant who knows the plaintiff has not investigated and is willing to accept \(r(p x - c_T) - c_D\) will set any pooling offer equal to \(S^* = r(p x - c_T) - c_D\). For the defendant to be willing to make a pooling offer of this amount in both meritorious and meritless cases, however, he must expect to do better settling all suits for \(S^*\) than going to trial. This condition is satisfied for meritorious suits, since \(r(p x - c_T) - c_D < p x - c_D - c_T\). As for meritless suits, the defendant never loses more than \(d_D\) because meritless plaintiffs always drop when they learn their suits are meritless after discovery. Therefore, the condition is satisfied for meritless suits if \(r(p x - c_T) - c_D \leq d_D\), or \(r \leq (c_D + d_D)/(p x - c_T)\).

3. Finally, consider the first constraint. For plaintiffs never to investigate in equilibrium, their expected value of suit without investigating must exceed their expected value with investigating, when defendants offer \(S^*\) and all uninformed plaintiffs accept. Under these conditions, the expected value of suit without any investigation is \(S^* - c_F\). The expected value with investigation is \(r(p x - c + z) - b - z\), since a plaintiff who learns her suit is meritorious will file, reject the offer of \(S^*\), and go to trial, and the plaintiff who learns her suit is meritless will not file. Thus, it must be the case that \(r(p x - c_T) - c_D - c_F > r(p x - c + z) - b - z\), which implies \(b > (1-r)(c_F + c_D - z)\). Furthermore, uninformed plaintiffs always sue in this equilibrium when \(S^* - c_F > 0\) and this implies that \(r > (c_F + c_D)/(p x - c_T)\).

Proposition II is also reasonably straightforward. The cost of investigating must be high enough given the plaintiff’s beliefs \(r\) so that plaintiffs are not tempted to investigate. That there is an upper bound on \(r\) follows from the fact that a pooling offer is costly for the defendant when
the plaintiff has a meritless suit (since the value of the suit is actually zero). The defendant knows he can make a meritless suit go away by proceeding through discovery and incurring costs of $d_D$. Therefore, there is a limit to how much the defendant is willing to offer. But the pooling offer increases in $r$ because a plaintiff demands more when she believes that there is a stronger chance her suit is meritorious. Therefore, the fact that there is an upper limit to the pooling offer implies that there must be an upper bound to $r$. The lower bound to $r$ follows from the fact that plaintiffs must be willing to file suit. Since it is costly to file, the pooling offer must be large enough to cover the filing costs. Since the pooling offer increases in $r$, this implies that $r$ must be greater than some lower bound.

3. Partial Pooling Equilibria

In separating and pure pooling equilibria, there is no risk of trial in a meritorious case or discovery in a meritless case. In a separating equilibrium, no meritless suits are filed and all meritorious suits settle. In a pure pooling equilibrium, all meritorious and meritless suits are filed and all settle, although for less than plaintiff’s entitlement in meritorious suits and more than plaintiff’s entitlement in meritless suits. Partial pooling equilibria are different because they involve mixed strategies and therefore end up generating discovery and trial costs.

In a partial pooling equilibrium, defendants pool sometimes but not always. In other words, defendants in meritorious suits sometimes make a pooling offer and sometimes make a separating offer. In order for defendants to be willing to randomize in this way, plaintiffs must either investigate sometimes or reject the pooling offer sometimes. For when plaintiffs never investigate and always accept, the result is a pure pooling equilibrium (or no lawsuits at all). At
the same time, it is clear that plaintiffs cannot always investigate or always reject in a partial pooling equilibrium, for if they did, then defendants would always make separating offers.

Therefore, plaintiffs induce separation either by investigating or rejecting. Which strategy they pursue depends on the relative cost of learning suit type by investigating versus conducting discovery. When investigation cost is high relative to discovery cost, then plaintiffs strictly prefer to learn suit type by rejecting and conducting discovery; therefore, they never investigate. When discovery cost is high relative to investigation, plaintiffs strictly prefer to learn suit type by investigating; therefore, they always accept the pooling offer when they are uninformed.

This means that there are two partial pooling equilibria. In one, plaintiffs investigate sometimes (but not always) and always accept the pooling offer. In the other, plaintiffs never investigate and reject the pooling offer sometimes (but not always). Thus, we have the following result:49

**PROPOSITION III: Partial Pooling Equilibria**

A. When \( r > (c_D+d_D)/(px-c_T) \) and \( b > (1-r)(c_f+c_D-z) \), there is a partial pooling equilibrium in which:

- Plaintiffs never investigate and always sue.
- Defendant always refuses to settle a meritless suit (i.e., offers \( S=0 \)).
- In a meritorious suit, the defendant makes a settlement offer of \( px-c_D-c_T+z \) with probability \( \tau \) and refuses to settle (offers \( S=0 \)) with probability \( 1-\tau \).

In equilibrium,

\[
\tau = \frac{r(px-c_T)-c_D}{r(px-c_D-c_T)}.
\]

- When defendant offers \( px-c_D-c_T+z \), plaintiff always accepts.

---

49 In both of these equilibria, beliefs off the equilibrium path support the equilibrium when they are specified in the same way as for Proposition II. See supra note **.
• When defendant refuses to settle (which happens in meritless and some
meritorious suits), plaintiff drops with probability \( \beta \) and litigates further
with probability \( 1-\beta \). In equilibrium, \( \beta = (c_D+c_T+d)/(px+d) \).

B. When \( r > (c_F+c_P)/(px-c_T) \) and \( (1-r)c_F-z < b < (1-r)(c_F+c_D-z) \) and \( z \) is not too large,
i.e., \( z \leq z_0 \) (see Appendix for specification of \( z_0 \)), there is a partial pooling
equilibrium in which:

• Plaintiff investigates with probability \( \Theta \) and does not investigate with
probability \( 1-\Theta \). In equilibrium, \( \Theta = (px-c_D-c_T+z)/(px+d) \).
• A plaintiff who investigates, files suit if and only if her suit is meritorious.
• A plaintiff who does not investigate always files suit.
• A defendant always refuses to settle a meritless suit (i.e., offers \( S=0 \)).
• In a meritorious suit, the defendant makes a settlement offer of \( px-c_D-c_T+z \)
with probability \( \tau \) and refuses to settle (offers \( S=0 \)) with probability \( 1-\tau \).
In this equilibrium, \( \tau = \frac{\tau(px-c_D-c_T+z)+(1-\tau)c_F-b-z}{\tau(px-c_D-c_T+z)} \).
• When defendant offers \( px-c_D-c_T+z \), the plaintiff always accepts.
• When defendant refuses to settle, the plaintiff who has not investigated
always drops.
• When defendant refuses to settle, the plaintiff who has investigated and
knows her suit is meritorious litigates through trial.

Proof: See Appendix B.

Proposition III’s equilibria are more difficult to explain in simple terms. Part A describes
the equilibrium when plaintiffs rely on a mix of information inferred from defendant’s settlement
offer and from discovery. Because this equilibrium depends on plaintiffs choosing discovery
over investigation, \( b \) cannot be too small. Hence the lower bound on \( b \). Moreover, the value of \( r \)
must be large enough to support mixed strategies in equilibrium and this accounts for the lower
bound on \( r \). Since plaintiffs never investigate, the equilibrium strategies do not depend in any
way on \( b \) or \( z \).

Part B describes the equilibrium when plaintiffs rely on a mix of investigation and
information inferred from defendant’s settlement offer. Because this equilibrium depends on
plaintiffs choosing investigation rather than discovery, \( b \) cannot be too large or else plaintiffs
would never investigate. Likewise, b cannot be too small or they would investigate all the time, which would produce the separating equilibrium of Proposition I. Hence the upper and lower bounds on b. Moreover, r must be large enough to support mixed strategies in equilibrium. Finally, because plaintiffs investigate sometimes, the equilibrium strategies depend to some extent on b and z, and the equilibrium cannot be sustained if plaintiff saves too much in discovery costs by investigating because then discovery would be a more attractive way to learn suit type than investigating (i.e., z cannot be too large).

C. Rough Summary

The following matrix provides a rough summary of the conditions that support each equilibrium. The rows reflect three different levels of r, the background probability suit is meritorious, and the columns reflect different levels of b, the non-recoupable cost of investigation. I say the summary is rough because the cutoffs for the different levels of r depend on b. Even so, it offers a useful organizational scheme. The matrix assumes that b is not so high that plaintiffs will never investigate and never sue if required to investigate.

<table>
<thead>
<tr>
<th></th>
<th>High b</th>
<th>Moderate b</th>
<th>Low b</th>
</tr>
</thead>
<tbody>
<tr>
<td>High r</td>
<td>III.A. Partial Pooling or II. Pure Pooling</td>
<td>III.B. Partial Pooling or II. Pure Pooling</td>
<td>I. Separating Equilibrium</td>
</tr>
<tr>
<td>Moderate r</td>
<td>Plaintiffs never investigate and never sue</td>
<td>III.B. Partial Pooling</td>
<td>I. Separating Equilibrium</td>
</tr>
<tr>
<td>Low r</td>
<td>Plaintiffs never investigate and never sue</td>
<td>Plaintiffs never investigate and never sue</td>
<td>I. Separating Equilibrium</td>
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</tbody>
</table>
IV. Defining a “Frivolous” Suit

From a policy perspective, we are interested in controlling meritless suits only when those suits are also “frivolous.” A meritless suit is frivolous in this model if plaintiff fails to conduct a prefiling investigation when it would have been reasonable for her to do so. The question is how to determine when a prefiling investigation is reasonable.

It is easy to see that an investigation duty is not needed when \( b < (1-r)c_F \), since according to Proposition I, plaintiffs always investigate unless \( r \) is very small, in which case they investigate or never sue.\(^{50}\) Moreover, when the probability of a meritorious suit is very small, i.e., when \( r < (c_F + c_D)/(px-c_T) \), an investigation duty is never justified for large values of \( b \), i.e., \( b > r(px-c) - (1-r)z \), because plaintiffs never sue anyway in equilibrium.

Therefore, the only situations that could possibly support an investigation duty are the pure pooling equilibrium of Proposition II and the partial pooling equilibria of Proposition III. Each of these situations generates costs in terms of unjustified wealth transfers (i.e., parties receiving benefits to which they are not entitled under the substantive law) or wasted litigation costs (i.e., filing, discovery and trial costs incurred because of the presence of meritless suits) – or both. The question is in which, if any, of these three equilibria does a duty to investigate reduce these costs. The following is a “first-best” answer to this question that assumes perfect compliance.

Imposing an investigation duty is tantamount to forcing the parties into the separating equilibrium of Proposition I, in which plaintiffs always investigate. Let LC denote total expected private litigation costs, including the cost of investigating; let EV denote plaintiff’s ex ante

---

\(^{50}\) Note that \( (1-r)c_F < (1-r)(c_F+c_D)z \). Therefore, by inspecting the conditions for the other equilibria, it is clear that this small a value of \( b \) supports only a separating equilibrium.
expected gain, and EL denote defendant’s ex ante expected loss. For the separating equilibrium, we have:

\[ LC = b + z + r c_F \]
\[ EV = r (p x - c + z) - b - z \] (1)
\[ EL = r (p x - c_D - c_T + z) \]

These expressions follow from the equilibrium strategies. First, consider \( LC \). Since plaintiffs always investigate, \( b + z \) is incurred in every case. Moreover, only plaintiffs with meritorious suits file and they receive a settlement immediately. Thus, filing costs of \( c_F \) are incurred in meritorious suits, which arise with a probability of \( r \). As for \( EV \), plaintiffs always investigate and therefore incur the cost of \( b + z \). And they receive a settlement of \( p x - c + z \) but only when their suit turns out to be meritorious, which happens with probability \( r \). Finally, \( EL \) follows from the fact that the defendant pays a settlement of \( p x - c_D - c_T + z \) but only in meritorious suits.

Therefore, we can compare \( LC \), \( EV \), and \( EL \) for the other equilibria to see if there is an improvement by forcing the case into the Proposition I separating equilibrium. First, consider Proposition III.B’s partial pooling equilibrium in which plaintiffs sometimes investigate and defendants sometimes refuse to settle a meritorious suit. The expressions for \( LC \), \( EV \) and \( EL \) are:

\[ LC = \Theta \left[ b + z + r c_F + r (1 - \tau)(c_D - z + c_T + d) \right] + (1 - \Theta) c_F \]
\[ EV = \Theta \left[ r (p x - c_D - c_T + z) - r c_F - b - z \right] + (1 - \Theta) \left[ r \tau (p x - c_D - c_T + z) - c_F \right] \]
\[ EL = \Theta \left[ r \tau (p x - c_D - c_T + z) + r (1 - \tau) (p x + d) \right] + (1 - \Theta) r \tau (p x - c_D - c_T + z) \]
These expressions follow readily by applying the equilibrium strategies. Consider the expression for LC. If plaintiff investigates (probability $\Theta$), plaintiff incurs costs of $b+z$ and files suit (cost of $c_F$) only if suit is meritorious (probability $r$). In this case, when the defendant refuses to settle (probability $1-\tau$), the plaintiff rejects and litigates through trial (cost $c_D-z+c_T+d$). (Recall that the plaintiff saves $z$ of discovery costs by investigating before filing.) If plaintiff does not investigate (probability $1-\Theta$), she always files suit (cost of $c_F$). EV and EL, while more complicated expressions, are constructed in the same systematic way.

Substituting the equilibrium expressions for $\Theta$ and $\tau$ from Proposition III.B and reducing, we get the following for LC, EV, and EL:

$$LC = b+z+\tau c_F$$

$$EV = r(px-c+z)-b-z \quad (2)$$

$$EL = r(px-c_D-c_T+z)$$

The expressions in (2) are identical to those in (1). The marginal benefit of a pre-filing investigation just offsets the marginal cost of investigating all the time. This means that a duty to investigate is strongly justified on efficiency grounds. It will not alter ex ante incentives or save private litigation costs, but it will reduce public litigation costs by reducing the number of trials and meritless filings.

The conclusions are more ambiguous for the other two equilibria. For example, the pure pooling equilibrium of Proposition II yields the following:

$$LC = c_F$$

$$EV = r(px-c_T)-c_D-c_F \quad (3)$$

$$EL = r(px-c_T)-c_D$$
Comparing (3) to (1), we can see that an investigation duty increases EL, and because this increase results from eliminating pooling, it improves defendants' incentives to take precautions ex ante. However, investigation also increases LC.\textsuperscript{51} In addition, it reduces EV because \( b > (1-r)(c_F+c_D-z) \) in the pure pooling equilibrium. Clearly the increase in LC is undesirable. Moreover, whether the reduction in EV is a problem depends on how one defines the ideal EV. Unfortunately, there is no obvious way to do this in a world with litigation costs.\textsuperscript{52}

Of course, imposing an investigation duty might still be efficient if the improvement in defendant incentives justifies the additional litigation costs and any adverse effect on plaintiffs. Unfortunately, however, it is not possible to tell without more information.

The same is true of the partial pooling equilibrium of Proposition III.A. The following expressions can be derived:

\[
LC = c_F+(1-r)c_D+(1-r)d_D(px-c_D-c_T)/(px+d) \\
EV = r(px-c)-(1-r)(c_F+c_D) \\
EL = r(px-c_D-c_T)+(1-r)d_D(px-c_D-c_T)/(px+d)
\]

Comparing (4) to (1), we see that investigation reduces LC if \( b < (1-r)(c_F+c_D-z)+(1-r)d_D(px-c_D-c_T)/(px+d) \). Provided \( b < r(px-c)-(1-r)z \) as well, no legitimate plaintiffs are deterred from suing, and investigation moves EL closer to the ideal by eliminating the discovery burden on meritless defendants. However, an investigation duty reduces EV, and once again, it is hard to say how this reduction affects social costs.

\textsuperscript{51} Although this is offset to some extent by the reduction in public costs due to the elimination of meritless filings.

\textsuperscript{52} For example, if the ideal is defined as the expected trial award in a legitimate suit (px), then pooling is better than separating. The same is true if the ideal also discounts for litigation costs, \textit{i.e.} equals r(px-c). Only if the ideal discounts for both litigation costs and investigation costs, \textit{i.e.} equals r(px-c+z)-b-z is the investigation equilibrium superior to the pooling equilibrium.
In sum, there is a clear case for finding an investigation reasonable – and therefore a
meritless suit frivolous – under conditions that support the equilibrium described in Proposition
III.B. The same may be true of the other two equilibria as well, but the costs and benefits are
less clear cut. Because the Proposition III.B equilibrium unambiguously supports an
investigation duty, I refer to it as the "frivolous suit equilibrium," and focus on it for the
remainder of this Article.

V. Comparative Statics

From Proposition III.B., we can derive expressions for the frequency of frivolous filings
and the frequency of settlement in the frivolous suit equilibrium. The frequency of settlement is
τ. Let π be the proportion of lawsuits that are frivolous. Recalling that frivolous plaintiffs file
only when they do not investigate, and applying Bayes's Rule, we get: π = (1-r)(1-Θ)/(r+(1-r)(1-
Θ)). Substituting the expression for Θ from Proposition III.B., this becomes:

\[ \pi = \frac{(1-r)(c_D+c_T+d-z)}{[(1-r)(c_D+c_T+d-z)+r(px+d)]} \]  

(5)

Therefore, we have the following comparative static results:53

Proposition IV: Effects on the Number of Frivolous Suits

In the frivolous suit equilibrium, the proportion of lawsuits that are frivolous (all other
variables held constant and subject to the equilibrium conditions being satisfied):

(1) Decreases as the fraction of potential meritorious suits (r) increases.
(2) Decreases as the expected trial award (px) increases.
(3) Increases with a non-investigating plaintiff's discovery cost (c_D) and with an
investigating plaintiff's discovery cost (c_D-z).
(4) Increases with plaintiff's trial cost (c_T).
(5) Increases with defendant's total costs (d).

These results assume that litigation costs do not vary with expected recovery. While this assumption simplifies
the analysis, it is not terribly realistic. In fact, litigation costs should increase with stakes and likelihood of success
should vary with the parties' relative investment in the suit.
(6) Is invariant to plaintiff's cost of filing ($c_F$).

**Proof:** By differentiation of $\pi$ with respect to the relevant variables.

Proposition V: Effects on Settlement Frequency

In the frivolous suit equilibrium, the proportion of meritorious lawsuits that settle (all other variables held constant and subject to the equilibrium conditions being satisfied):

(1) Increases as the fraction of potential meritorious suits ($r$) increases if $b+z > c_F$, but decreases if $b+z < c_F$.
(2) Increases with the expected trial award ($px$).
(3) Decreases as a noninvestigating plaintiff's discovery cost ($c_D$) increases.
(4) Decreases as plaintiff's trial cost ($c_T$) increases.
(5) Is invariant to defendant's total cost ($d$).
(6) Increases with plaintiff's cost of filing ($c_F$).

**Proof:** By differentiation of $\tau$ with respect to the relevant variable.

VI. Some Implications for Enforcement

The following discussion evaluates the three most common methods for deterring frivolous suits: strict pleading, penalties, and fee shifting. The Supreme Court required strict pleading in its *Twombly* and *Iqbal* decisions and Congress codified it for securities fraud suits in the PSLRA. Penalties have some bite in federal court ever since Rule 11 was amended in 1983. And the British Rule on fees is a favorite reform proposal. In the final section, I briefly discuss two other proposals for dealing with frivolous suits, one of which involves giving the defendant an option to bar settlement and the other of which relies on mandatory summary judgment.

As a point of contrast, I also discuss how each method fares in Katz's strike suit model, where plaintiffs know suit is meritless but defendants do not.\(^{54}\) When the informational

\(^{54}\) See *supra* notes ** & accompanying text.
asymmetry is reversed from the investigation model, the effects can be different. This counsels in favor of a targeted regulatory approach, at least if the costs of targeting are not too high.

A. Strict Pleading

Under strict pleading, plaintiffs must allege facts with specificity or face possible dismissal for failure to state a claim. The rationale for strict pleading as a way to deter frivolous suits is relatively straightforward. Since plaintiffs must allege more facts up front, they will have to spend more to file and will have stronger incentives to investigate before filing.

In the investigation model, a strict pleading rule has two different effects. First, it encourages plaintiffs to conduct a prefiling investigation, which might reveal that suit is meritless. Second, it can encourage investigation beyond the point that is socially optimal. For example, if a plaintiff must allege the details of her medical condition or treatment to bring a medical malpractice suit, she will be more likely to investigate before filing. Of course, she might simply fabricate the allegations, but this seems unlikely because defendant knows the facts. Moreover, unlike attorneys in strike suits who file knowing suit is meritless, attorneys who fail to investigate are not necessarily morally bad actors and therefore should be more likely to refrain from filing once they realize the suit lacks merit. Investigating up to the point that reveals whether suit is meritorious is socially desirable in the frivolous suit equilibrium, but the plaintiff might not stop at this point. A strict pleading rule could easily induce investigation beyond the socially desirable level.

I model investment beyond this minimum as a shift of costs, \( w \), from the discovery to the filing stage.\(^5\) Therefore, an investigating plaintiff’s cost of discovery changes from \( C_D \) - \( z \) in the

\(^5\) In this respect, I follow Katz’s analysis of the effect of strict pleading on strike suits. See Katz, supra note **, at 16-17.
model to $c_D - z - w$ and the cost of filing suit increases from $c_F$ to $c_F + w$. On the positive side, this cost shift can reduce the number of frivolous filings. For one thing, with a cost shift, the Proposition I equilibrium, in which plaintiffs always investigate, will hold more often. This follows from the fact that the equilibrium condition, $b < (1-r)c_F - z$, is more likely to hold when $c_F$ is larger. In addition, the cost shift also increases the rate of prefiling investigation in the frivolous suit equilibrium, so fewer frivolous suits are filed. This follows from the fact that $\Theta$ increases as $c_D + c_T$ decreases and that $\Theta$ does not depend on $c_F$.

Moreover, the cost shift can also have a beneficial effect on the rate of settlement. To see this, modify the expression for $\tau$ in Proposition III.B to include a cost shift of $w$:

$$\tau = \frac{r(p + c_D - c_T + z + w) + (1-r)(c_F + w) - b + z}{r(p + c_D - c_T + z + w)}$$

(6)

By differentiating (6) with respect to $w$, it is easy to see that $\tau$ (the rate at which the strictly positive offer is made in meritorious suits) increases as $w$ increases.

There is a potential problem, however. A strict pleading rule that shifts costs from discovery to filing can increase total private litigation costs. This is clear from the expression for LC in (2), which obviously increases with $c_F$. In effect, the higher filing cost for all suits more than offsets the benefit produced by fewer frivolous suits and more frequent settlements. On the other hand, total litigation costs might decrease if public costs are counted as well. The reason is easy to see. Additional prefiling investigation does not require an additional investment on the public side, but it does reduce public court costs by discouraging frivolous filings and encouraging settlements.
These results are different from the same results in Katz’s strike suit model. Katz also models a strict pleading rule as a cost shift from discovery (and trial) to filing.\textsuperscript{56} He assumes that legitimate plaintiffs will have to investigate more in order to plead with greater specificity and that all the costs of investigation will be recouped later by savings at the discovery and trial stages. Katz also assumes that the cost shift will increase filing costs for both legitimate and frivolous plaintiffs, but this seems unlikely for frivolous plaintiffs. If an attorney is willing to file a suit knowing it is frivolous, she should also be willing to fabricate the necessary allegations. And since the defendant is ignorant of the actual facts, lying can be successful.

Accordingly, by modifying Katz’s competitive equilibrium results to limit the cost shift to legitimate plaintiffs, one can show that a cost shift reduces the number of frivolous suits and the number of settlements.\textsuperscript{57} These two effects just offset one another insofar as private litigation costs are concerned, so LC remains the same with or without the shift.\textsuperscript{58} However, the shift increases public litigation costs if, as is almost certainly true, the public cost of discovery and trial far exceeds the public costs of processing a filing.\textsuperscript{59} Therefore, strict pleading might make matters worse in the Katz model.\textsuperscript{60}

It follows that the desirability of strict pleading depends to a large extent on which party is better informed, plaintiff or defendant, and the answer can vary across different litigation

\textsuperscript{56} See Katz, supra note **, at 16-17.
\textsuperscript{57} With a cost shift of w, the new expressions for q (the rate at which frivolous plaintiffs file) and \( \sigma \) (the rate at which defendants make the attractive settlement offer) in the competitive equilibrium are: 
\[ q = \frac{r(c_{q} + c_{r} + d - w)}{(p - c_{q} - c_{r} + w) + \sigma}. \]
\textsuperscript{58} \( \text{LC} = r(c + d), \) where r is the background probability of merit suits, \( c = c_{q} + c_{r} + c_{r}, \) and \( d = d_{q} + d_{r}. \)
\textsuperscript{59} Let F be the public cost of processing a filing and G be the public cost of discovery and trial. Then total public litigation cost is: 
\[ F + (1 - r)qF + r(1 - \sigma)G. \] Substituting the new equilibrium values for q and \( \sigma, \) see supra note 25, and differentiating with respect to w, it can be shown that public litigation costs increase with increasing w if and only if \( G/F > (p + d)/c_{r}. \)
\textsuperscript{60} I have discussed the results only for the competitive equilibrium, but it is significant to note that the competitive equilibrium is more likely to hold with a cost shift.
settings. Strict pleading promises greater benefits when defendant is the informed party than when plaintiff is, because it creates incentives for uninformed plaintiffs to investigate before filing. However, it can also increase costs depending on how much plaintiff has to investigate to meet the rule’s requirements. Moreover, to the extent the rule applies to cases with high investigation costs – where $b > r(px-c)-(1-r)z$ – it can have a chilling effect on meritorious suits as well. For when investigation costs are very high, meritorious plaintiffs will not sue if they must first investigate. Thus, a strict pleading rule should be confined to cases with moderate investigation costs.

Of course, it might be difficult for a judge to determine the information structure and the cost of a merits-revealing investigation ($b+z$) on a case-by-case basis. However, it might be possible to distinguish general types of litigation along these lines. If so, rulemakers could create different rules for different litigation types.

B. Penalties

Penalties are a common way to deter undesirable litigation behavior these days. For example, Rule 11 of the Federal Rules of Civil Procedure uses a penalty system, as do Rules 27 and 37 to deal with discovery abuse. The penalty approach has an advantage over strict pleading. Because penalties are imposed ex post, their effects can be confined to frivolous lawsuits. For this reason, a penalty system can, at least in theory, avoid some of the problems of strict pleading, such as the risk of excessive cost-shifting. On the other hand, a penalty system generates its own costs, including administrative costs associated with determining whether suit is frivolous and risk-bearing costs associated with erroneous imposition of high penalties.
In the Katz model, penalties reduce the frequency of frivolous filings, increase the frequency of settlement, and reduce total litigation costs. As the penalty increases, the equilibrium approaches the first best outcome, in which only legitimate plaintiffs sue and all suits settle. However, Katz concludes that the penalty must be set so high that the risk of an erroneous imposition is likely to deter many legitimate filings.

The analysis is different for the investigation model. Suppose that the court is perfectly accurate and imposes a penalty in the amount, $y$, only when suit is frivolous; that is, only when the conditions for the frivolous suit equilibrium obtain and plaintiff does not investigate before filing. The effect of imposing a penalty under these circumstances is to increase the cost of bringing a frivolous suit. No longer is a zero settlement the worst outcome for a frivolous plaintiff. The worst outcome is: $-y$. In other words, the plaintiff might have to make a payment of $y$ to the defendant.

This change increases the lower cutoff for $b$ that separates the frivolous suit equilibrium from the Proposition I equilibrium in which plaintiffs always investigate. Intuitively, when plaintiffs in the frivolous suit equilibrium face a penalty for filing meritless suits, it costs them more to learn suit type from defendant’s settlement offer. This means that they will prefer to investigate all the time even at a higher investigation cost. As the penalty increases, the investigation cost cutoff where plaintiffs choose to investigate all the time increases. By setting the penalty high enough, therefore, we can induce plaintiffs to investigate all the time over the entire range of investigation cost that produces the frivolous suit equilibrium of Proposition III.B.

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61 See Katz, supra note 10, at 19-20.  
62 Id. at 20.
More formally, recall that the cutoff separating the frivolous suit equilibrium from the Proposition I equilibrium is \((1-r) c_f - z\) in the absence of a penalty. Modeling \(y\) as a cost imposed on filing a frivolous suit, the cutoff increases to \((1-r) (c_f + y) - z\). Recall that the upper limit on \(b\) for the frivolous suit equilibrium is \((1-r)(c_f + c_D - z)\). Therefore, the value of \(y\) that induces investigation over the entire range of \(b\) values supporting the frivolous suit equilibrium is the value of \(y\) that satisfies the equation: \((1-r) (c_f + y) - z = (1-r)(c_f + c_D - z)\). Solving for \(y\), we get \(y = c_D + rz / (1-r)\). Therefore, plaintiffs always investigate in the frivolous suit equilibrium when they face a penalty of \(y = c_D + rz / (1-r)\).

Thus, it is at least theoretically possible in the investigation model to deter all frivolous suits by adjusting the penalty amount. The problem with this approach, however, is that courts are not perfectly accurate, and error creates additional costs. For example, if courts sometimes mistakenly determine that a meritorious suit is meritless, meritorious plaintiffs might be chilled from bringing suit – and especially so for risk-averse plaintiffs since the prospect of a penalty increases risk-bearing costs. Furthermore, if courts sometimes determine that the conditions for a frivolous suit equilibrium hold when in fact they do not, meritless suits might be penalized even when they are not frivolous – a risk that can induce excessive investment at the investigation stage.

Thus, the desirability of a penalty system is more ambiguous in the investigation model than in the Katz model. If the risk of error at the penalty stage is low enough and the
administrative costs are not too high, penalties might be an effective way to deter frivolous filings.\textsuperscript{63}

C. **British Rule-Type Fee Shifting**

Under the British Rule, the losing party must pay the winning party’s attorney’s fees and costs. Many people urge adoption of the British Rule, partly in order to deter frivolous suits. The argument is that a frivolous plaintiff will be deterred from filing if she expects to pay not only her own but also the defendant’s fees and costs.

Katz analyzes the effect of the British Rule in the context of his competitive equilibrium.\textsuperscript{64} He shows that switching to the rule reduces the number of frivolous filings and increases the number of trials – so long as a legitimate plaintiff’s likelihood of success (p) is high enough that adoption of the British Rule increases the expected value of a legitimate suit. These two effects just cancel, however, so total private litigation costs remain the same.\textsuperscript{65} Moreover, a frivolous plaintiff is not deterred by the prospect of paying defendant’s fees because frivolous suits never go to trial in the model. Based on this, Katz concludes that switching to the British Rule will do little to address the problem of strike suits.

The British Rule has a somewhat different effect in the investigation model. Because frivolous plaintiffs never go to trial, they never have to fear paying defendant’s fees. But switching to the British Rule affects the rate of investigation and settlement in the frivolous suit

\textsuperscript{63} Of course, error risk and administrative cost are related. Presumably the more a court invests in determining whether a suit is frivolous, the lower is its risk of error. The ideal penalty procedure then minimizes the total of administrative and error costs.

\textsuperscript{64} Katz, supra note 10, at 18. In fact, he analyzes a family of fee-shifting rules that vary according to the fraction of the winning party’s fees and costs the losing party must pay. Here I consider only the extreme British Rule that shifts all fees and costs.

\textsuperscript{65} However, costs are likely to increase when they are endogenized. Switching to the British Rule has the effect of increasing the stakes for a legitimate plaintiff whenever it improves his expected value. Moreover, if the public costs of discovery and trial greatly exceed the public cost of processing a frivolous filing, total public costs should increase as well.
equilibrium. Following Katz, let \( u \) be the amount by which adoption of the British Rule changes the expected value of a meritorious suit prior to filing. Therefore:

\[
    u = [p_x-(1-p)(c+d)]-c_e = pc(1-p)d
\]

Thus, a legitimate plaintiff expects to gain \( p_x-c+u \) from trial and defendant expects to pay \( p_x+d+u \). Moreover, the attractive settlement offer becomes \( p_x-c_D-c_T+z+u \). With these new values, we can calculate new expressions for \( \Theta \) and \( \tau \):

\[
    \Theta = (p_x-c_D-c_T+z+u)/(p_x+d+u) \quad (7)
\]

\[
    \tau = [r(p_x-c_D-c_T+z+u)+(1-r)c_T-b-z]/ r(p_x-c_D-c_T+z+u) \quad (8)
\]

By differentiating (7) and (8), it is clear that \( \Theta \) and \( \tau \) increase with adoption of the British Rule, provided that \( u > 0 \). Intuitively, plaintiffs investigate more often because the reward for investigating is larger, and as a result, defendants make attractive settlement offers more often. This change in behavior has a beneficial effect by reducing the number of frivolous filings and increasing the number of settlements. Although this does not change total private litigation costs, it can reduce public costs. However, switching to the British Rule also has a deleterious effect: It drives more suits into the frivolous suit equilibrium. This is because the lower bound on \( r \) in the frivolous suit equilibrium is smaller under the British Rule, so it is likely to be satisfied more frequently.

Thus, switching to the British Rule is not likely to help in those litigation settings where asymmetric information favors the plaintiff, but it might help where asymmetric information favors the defendant. Even in the latter situation, however, the case for the British Rule depends on whether the potential increase in suits qualifying as frivolous eliminates whatever benefit accrues from a higher rate of investigation and settlement.
D. Two Other Proposals

Two additional proposals for deterring frivolous suits are worth discussing briefly. The first is set out in a 2006 article by David Rosenberg and Steve Shavell.66 This approach involves giving the defendant an option to bar settlement. Rosenberg and Shavell reason that if the defendant could bar enforcement of a settlement, the defendant would choose to exercise the option only in frivolous suits, and as a result no frivolous suits would be filed.67 The second proposal is discussed in a 2004 article by Randy Kozel and David Rosenberg.68 It relies on mandatory summary judgment to deter frivolous filings. Kozel and Rosenberg assume that defendants settle frivolous suits because settlement is less costly than going through summary judgment, and they conclude that frivolous plaintiffs will not file when they know that their suit must survive a summary judgment before any enforceable settlement can be reached.

The authors examine each proposal in the context of the Rosenberg-Shavell complete information model discussed above.69 This leaves the question of how effective these proposals can be under conditions of asymmetric information. The following discussion examines this question briefly.

It is easy to see why giving the defendant the option to bar settlement does not work well when information is asymmetric.70 Because the defendant has to know that the suit is meritless in order to invoke the option properly, the option approach is not likely to be effective when the

67 Actually, their definition of frivolous suits includes any suit that the plaintiff would not take to trial, including NEV suits that are not frivolous by my definition.
69 See supra notes 22-24 & accompanying text.
70 There are other potential problems with giving the defendant an option to bar settlement. See Ted Sichelman, Why Barring Settlement Bars Legitimate Suits: A Reply to Rosenberg and Shavell, 18 CORNELL J. LAW & PUB. POL’Y 57 (2008).
defendant is uninformed, as in the Katz model. Also, in the investigation scenario, the defendant never settles a meritless suit, so it is unclear that an option to bar settlement adds anything useful, except possibly another way for the defendant to signal suit type and another opportunity for pooling.

The mandatory summary judgment proposal has more promise. It differs from the option approach in making summary judgment review mandatory in every case rather than optional for the defendant. Mandatory summary judgment therefore operates as an early screening device, forcing the plaintiff to provide evidence supporting her claim before she can settle the suit. By doing so, it gives the defendant a credible threat to proceed through summary judgment rather than settle, and this threat deters the filing of meritless suits that would be exposed at the summary judgment stage. As a result, the defendant, at least in theory, never has to actually incur the cost of summary judgment in a meritless suit.

This line of reasoning works best when the plaintiff and the defendant both know that the suit is meritless. But it can also work when information is asymmetric. In the investigation model, mandatory pre-filing summary judgment, if perfectly accurate, has the effect of preventing plaintiffs from relying on settlement offers to learn suit type, since a meritless suit will be dismissed at summary judgment before any offer. Moreover, if mandatory summary judgment takes place before discovery, the plaintiff cannot rely on discovery either. As a result, the prospect of early, pre-settlement summary judgment review should create incentives for plaintiffs to conduct pre-filing investigations when the cost of an investigation is not too high.

There are several problems with this rosy scenario, however. First, the proposal assumes that the plaintiff will have sufficient evidence to get past summary judgment when her claim is
meritorious. But this depends on what the plaintiff is able to learn through an investigation and how strict the summary judgment standard is. There is no guarantee that a prefiling investigation will turn up admissible evidence on each element of the plaintiff's trial burden of production. This means that a regular summary judgment proceeding could end up screening out meritorious suits if it takes place prior to discovery. The proceeding could be postponed until after discovery is completed, but then plaintiffs would have incentives to rely on discovery rather than investigation to learn suit type when the expected cost of discovery for them is less than the cost of an investigation; i.e., when \((1-r)(c_F+c_D) < b+(1-r)\gamma\). As a result, defendants would also have to invest in discovery in meritless suits, which could increase total litigation costs to the point where investigation is superior from a social point of view.

Second, mandatory summary judgment requires that the parties incur the costs of a summary judgment proceeding and possibly also the cost of discovery in meritorious suits. Depending on how large the fraction of meritorious suits \((r)\) is, these costs could be substantial.

One way to reduce these problems is to implement an early screening procedure that is not a full-blown summary judgment. Another way is to have the judge conduct discovery in stages with a review of the merits after each stage and a decision whether to allow another stage contingent on the results of that review. This is not the place to examine these modified proposals with care. They also generate problems in the investigation model, but those problems might be less serious than the problems associated with the mandatory summary judgment approach.
VII. Conclusion

The foregoing analysis shows that plaintiffs file meritless suits without investigating even when they know that investigation is cheaper than learning suit-type through discovery and that meritless suits never receive a positive settlement. The reason is that plaintiffs anticipate learning something from defendant’s offer.

Using a relatively simple investigation model, we have identified conditions under which a failure to investigate should make suit “frivolous.” These conditions obtain in the equilibrium where plaintiffs sometimes investigate and always accept a zero offer when they are uninformed. While Proposition III.B states these conditions in mathematical form, they can be operationalized with a relatively simple test: A pre-filing investigation is reasonable and therefore should be required if and only if it is the kind of investigation a rational plaintiff would undertake if she otherwise expected to learn nothing about whether her suit was meritless until after discovery. This test in effect forces plaintiff’s attorney to ignore the possibility of receiving a signal from defendant’s settlement offer, and this is beneficial because it eliminates the strategic behavior responsible for high costs.

This model fills a gap in the frivolous suit literature. Some previous models are not convincing as plausible accounts of frivolous suits. Those that are focus on the strike suit case, where the plaintiff knows suit is frivolous and uses cost or informational asymmetries to leverage a settlement from the defendant. Many of the cases, however, involve uninformed plaintiffs and informed defendants, and in these cases, a suit is frivolous when it is meritless and the plaintiff fails to conduct a reasonable pre-filing investigation. One needs an investigation model to understand the parties’ incentives in this scenario.
Moreover, we saw that the results of the investigation model differ in important respects from the results of the Katz model, in which the plaintiff has private information about suit type. These differences might suggest the desirability of a targeted approach to regulation, one that designs enforcement measures to fit the information structure and other features of different classes of litigation. Moreover, we also saw that some enforcement devices criticized by Katz, such as strict pleading, penalties, and the British Fee-shifting rule, are a bit more promising in an investigation model.

However, there are limits to the investigation model. For one thing, the equilibrium results are sensitive to the bargaining structure of the settlement subgame. The model analyzed in this Article assumes that the defendant makes a take-it-or-leave-it offer, an assumption that it shares with the Katz model. More complex bargaining games are likely to produce different results. But the basic qualitative predictions — that plaintiffs do not always investigate, sometimes file meritless suits, and sometimes have to try meritorious suits, wasting litigation costs and inducing wealth transfers — might not change markedly.

Another restrictive feature is that the model is discrete rather than continuous: it assumes that plaintiff has only two moves at the investigation node and that there are only two types of suit. In a more realistic model, plaintiff would choose how much to spend on an investigation, knowing that the more she spent the more useful information she would obtain. Moreover, lawsuit type could vary with probability of success distributed continuously over the interval [0,1].

Finally, the model analyzed here, as well as the Katz model, ignores private devices that can reduce frivolous filings. Two such devices are especially relevant under conditions of
asymmetric information: reputation markets and bonding. In a reputation market applied to the investigation model, lawyers serve as signaling intermediaries by developing a reputation for always investigating and suing only when suit is meritorious.\textsuperscript{71} Under these circumstances, a defendant confronting a suit filed by a lawyer with a reputation will make the high settlement offer rather than try to pool, and this should produce the separating equilibrium. Given the prospect of receiving a high settlement for sure in a meritorious suit, plaintiffs with meritorious claims should be willing to pay a premium to lawyers with the requisite reputation, and the prospect of earning this premium should induce lawyers to invest in developing this reputation. To be sure, there are obstacles to formation of reputation markets, but when conditions are favorable, this device can substitute for public regulation.

Furthermore, a plaintiff who has investigated and knows she has a meritorious suit can use a bonding strategy to signal the defendant.\textsuperscript{72} In the investigation model, she would signal the fact that she has investigated; in the strike suit model, she would signal the fact that she has a meritorious suit. For example, plaintiff might deposit a sum in escrow on condition that the sum is paid to the defendant in the event suit is dismissed or voluntarily dropped before trial. Other plaintiffs who wish to pool would have to agree to the same arrangement, and this would be more expensive for them because they face a higher risk of actually paying the deposit. In theory, legitimate plaintiffs could deter all frivolous filings by setting the deposit amount at the right level – but only if courts are perfectly accurate and never dismiss a legitimate suit. However, courts are not perfectly accurate, and the risk of erroneous dismissal in effect places an

\textsuperscript{71} We briefly examined the Farmer-Pecorino reputation model above. See supra notes 31-32 & accompanying text. Farmer and Pecorino apply their model not only to complete information scenarios, but also to Katz’s asymmetric information case. It is possible that a similar reputation game could be developed for my investigation model as well.

\textsuperscript{72} In fact, reputation is a type of bonding as well.
upper limit on the deposit, which in turn limits the utility of the bonding strategy. Nevertheless, a bonding strategy might be superior to public regulation under some circumstances.

In the end, the question of how best to regulate frivolous suits is complex in large part because the problems of frivolous litigation and the effects of regulation are so sensitive to context. This Article is an effort to explicate some of that complexity and to fill a gap in the frivolous suit literature.

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73 In effect, a bonding strategy is the private analogue of a publicly-enforced penalty system, and error limits both devices in the same way.
\( P_L \) - meritorious plaintiff

\( P_M \) - meritless plaintiff
APPENDIX B

*Proof of Proposition III:* Let $S_1$ denote the equilibrium separating offer and $S_2$ denote the equilibrium pooling offer. We prove Part A first and then Part B.

*Proof of Part A.* For defendants to be willing to randomize between $S_1$ and $S_2$ in a meritorious case when plaintiffs never investigate, plaintiffs must reject $S_2$ some of the time. Obviously, defendants always offer $S_2$ in a meritless suit, since they have nothing to gain from randomizing, and $S_2 \leq d_p$, since defendants can lose no more than $d_p$ in a meritless suit if plaintiffs reject. Furthermore, since $r(px-c_T)-c_T \geq d_p$, defendants in meritless suits are never willing to make a pure pooling offer that plaintiffs would always accept, and since $d_p > c_T$, it follows that $r(px-c_T)-c_T > c_T$ and all uninformed plaintiffs sue. This means that defendants in meritorious suits will randomize, and when they do, they offer $S_1 = px-c_D-c_T$, because in this equilibrium $S_1$ signals plaintiff that suit is meritorious. (Plaintiffs never investigate; so they expect to spend $c_D$ on discovery and therefore will accept $px-c_D-c_T$.)

Let $\tau$ be the equilibrium rate at which defendants randomize between $S_1$ and $S_2$ in meritorious suits, and let $\beta$ be the equilibrium rate at which plaintiffs accept $S_2$. For defendant to be willing to randomize in a meritorious case when plaintiffs accept $S_2$ with probability $\beta$, defendant's payoff from playing each option must be the same. Therefore, $px-c_D-c_T = \beta S_2 + (1-\beta)(px+d)$. Solving for $\beta$, we get:

$$\beta = \frac{c_D + c_T + d}{px + d - S_2}$$

(1)

Similarly, for an uninformed plaintiff to randomize when he receives an offer of $S_2$ and believes that defendants randomize with $\tau$, the payoffs from acceptance and rejection must be equal. Letting $\phi$ denote plaintiff's updated probability that her case is meritorious after observing $S_2$, this equality condition is $S_2 - c_T = \phi(px-c_T) - (1-\phi)(c_T + c_D)$. Solving for $\phi$, we get:
\[ \phi = \frac{c_D + S_2}{px - c_T} \]  

We also know by Bayes's Rule that:

\[ \phi = \frac{r(1 - \tau)}{r(1 - \tau) + 1 - r} \]  

Equating (2) and (3) and solving for \( \tau \), we get:

\[ \tau = \frac{r(px - c_T) - c_D - S_2}{r(px - c_T - c_D - S_2)} \]  

Next we must solve for the equilibrium value of \( S_2 \). A defendant creates two opposing effects when she increases \( S_2 \) in a meritless suit. One effect is to increase her potential loss, and the other effect is to reduce the loss by increasing the probability, \( \beta \), with which plaintiffs accept. Defendant's expected loss, \( L_d(S_2) \), from always offering \( S_2 \) in a meritless suit when plaintiffs accept with probability \( \beta \) is \( L_d(S_2) = \beta S_2 + (1 - \beta)d_d \). Differentiating this expression, we get

\[ \frac{dL_d}{dS_2} = \beta + S_2 \frac{d\beta}{dS_2} - d_d \frac{d\beta}{dS_2} \]  

Differentiating \( \beta \) given by (1) and substituting for \( \beta \) and its derivative, we have:

\[ \frac{dL_d}{dS_2} = \frac{(px + d)(c_D + c_T + d - d_d) + (px - c_D - c_T)d_d}{(px + d - S_2)^2} \]
Since \(d > d_1\) and \(px - c_D - c_T > 0\), \(dL_d/dS_2 > 0\) for all \(S_2\). Therefore, defendants minimize their loss by choosing the smallest feasible \(S_2\) in a meritless suit. Hence, \(S_2 = 0\).

Substituting \(S_2 = 0\) into (1) and (4), we get:

\[
\tau = \frac{r(px - c_T) - c_D}{r(px - c_T - c_D)}
\]

\[
\beta = \frac{c_D + c_T + d}{px + d}
\]

It only remains to show that with these values of \(\tau\) and \(\beta\) plaintiffs never investigate when \(b > (1-r)(c_f + c_D - z)\). When plaintiffs do not investigate, the expected value of suit is \(r[\tau(px - c_D - c_T) + (1 - \tau)(1 - \beta)(px - c_D - c_T)] - (1-r)(1-\beta)c_D c_T\), which becomes \(r(px - c) - (1-r)(c_f + c_D)\) when the equilibrium values of \(\tau\) and \(\beta\) are substituted. The expected value of suit with investigation is \(r(px - c + z) - b - z\). The former exceeds the latter when \(b > (1-r)(c_f + c_D - z)\).

**Proof of Part B.** For defendants to be willing to randomize between \(S_1\) and \(S_2\) in a meritorious case when plaintiffs always accept \(S_2\), plaintiffs must investigate sometimes. However, plaintiffs cannot investigate all the time when \(r > c_f/(px - c_D - c_T + z)\) and \(b > (1-r)c_f - z\), for if they did then defendants would separate, but Proposition I shows that separation is not possible for these values of \(r\) and \(b\). Therefore, plaintiffs investigate sometimes but not always, as this partial pooling equilibrium requires.

Furthermore, \(S_1 = px - c_D - c_T + z\), because this is the offer that an investigating plaintiff would accept. Also \(S_2 = 0\) when uninformed plaintiffs always accept. This is because informed plaintiffs never file meritless suits when \(S_2 = 0\), so defendant expects to lose 0 in a
meritless suit by offering 0.

Let \( \Theta \) be the equilibrium probability with which plaintiff investigates and \( \tau \) be the equilibrium probability with which defendants offer \( S_1 \). For defendants to be willing to randomize in a meritorious suit, they must expect equal payoffs from each alternative, assuming every other player follows his equilibrium strategy. Under these conditions, defendant expects to lose \( \Theta(px+d) \) by offering \( S_2=0 \) all the time, and \( px-c_D-c_T+z \) by offering \( S_1 \) all the time (since all plaintiffs accept \( S_1 \)). Therefore, defendant is willing to randomize in a meritorious case if and only if \( \Theta(px+d)=px-c_D-c_T+z \). Solving for \( \Theta \) we get:

\[
\Theta = \frac{px-c_D-c_T+z}{px+d}.
\] (7)

Similarly, plaintiffs are willing to randomize only if payoffs are equal from investigating and not investigating when all other equilibrium moves are fixed. This condition is \( r(px-c+z)+b-z = rt(px-c_D-c_T+z)-c_p \). Solving for \( \tau \), we get:

\[
\tau = \frac{r(px-c_D-c_T+z) + (1-r)c_p - b - z}{r(px-c_D-c_T+z)}.
\] (8)

Finally, for this equilibrium to hold, it must be the case that plaintiff is willing to accept \( S_2=0 \) when she does not investigate and defendants follow their specified strategies. The problem with satisfying this constraint is that the cost shift \( z \) can make it difficult to establish beliefs for a noninvestigating plaintiff at the \( S_2 \) node that make him willing to accept. To see this, let \( \phi \) be an uninformed plaintiff's belief that her suit is meritorious conditional on receiving an offer of 0. We know from Equation (4) in this Appendix and the proof of Part A that defendants in meritorious suits must randomize with a probability \( \tau^* = \frac{r(px-c_T-c_D)}{r(px-c_D-c_T)} \) to generate beliefs that make uninformed plaintiffs just indifferent between accepting and rejecting an offer of 0. So plaintiffs always reject an offer of 0 when
\( \tau < \tau^* \), and always accept when \( \tau > \tau^* \). Therefore, in order for an uninformed plaintiff to be willing to accept all the time, as is required in this equilibrium, it must be the case that the equilibrium value of \( \tau \) given by (8) equals or exceeds \( \tau^* \), or in other words:

\[
\frac{r(px - c_D - c_T + z) + (1-r)c_F - b - z}{r(px - c_D - c_T + z)} \geq \frac{r(px - c_T) - c_D}{r(px - c_T - c_D)}
\]

Solving this inequality for \( z \), we get \( z \leq z_0 \), where:

\[
z_0 = \frac{(px - c_D - c_T)[(1-r)(c_F + c_D) - b]}{px - c_D - c_T - (1-r)c_D}
\]  \hspace{1cm} (9)

Notice that when \( b < (1-r)(c_F + c_D) \), as the conditions for this equilibrium require, the numerator of \( z_0 \) is positive. Therefore, this equilibrium can hold only when the denominator is positive too, or only when \( px - c_D - c_T > (1-r)c_D \). This condition always holds when \( r > (c_F + c_D)/(px - c_T) \), and for lower values of \( r \), it is a very plausible assumption.