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FRIVOLOUS SUITS IN THE INFINITELY-REPEATED LITIGATION GAME WITH UNCERTAINTY*

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Abstract

We explain why 'frivolous suits (FS)' occur particularly under complete information. Existing analyses such as the 'traditional' and the 'early-defense-cost' models are not fully robust in that they either drop the plaintiff's withdrawal option or rely on a restrictive assumption that the defendant loses immediately unless he early defends himself at high cost. We pursue a more generalized explanation. We offer an infinite-period litigation model with uncertainty which reflects the reality more consistently. We then show that FS can occur as a subgame perfect equilibrium since the defendant over the pre-trial stage may settle with FS to save future time and/or trial costs. We further demonstrate that FS can occur even under the British rule of fee shifting.

Keywords: frivolous suit, negative expected value suit, uncertainty, time cost, settlement, American rule, British rule
JEL Classification Codes: K4, H4

I. *Introduction*

A casual observation reveals that the threat of perverse litigation abounds. By 'perversity,' we mean that *both* litigants are aware that the plaintiff's prevailing probability is so negligible

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that the plaintiff's expected value from the final trial is negative.[1] In the literature, this kind of suit is called a 'frivolous suit (hereafter **FS**),' or 'negative expected value (hereafter **NEV**)' suit.[2] Again, what makes such suits 'perverse' is that the defendant pays a lucrative amount of settlement to the plaintiff, even if *both* know for certain that the suit is frivolous.

Being a seemingly voluntary and Pareto-improving exchange, settlement out of FS is yet a typical occasion of the 'coerced transfers' *à la* Basu (2007) that exploit the existing legal institutions. Indeed, FS is a welfare-reducing interaction between economic agents. Potential plaintiffs dissipate resources in pursuit of their quarry. FS also causes severe crowding-out in the court's resource allocation. Perhaps, from a more dynamic perspective, their worst effect would be the prevalence of reciprocal coercion in the economy. In the United States, for example, courts therefore use Federal Rules of Civil Procedure 11 to deter plaintiffs from filing FS.[3]

The fundamental question regarding FS is why the defendant settles with the plaintiff in spite of the fact that the former will obviously prevail if the case goes to the final trial. Alternative theories since the 1980s, broadly speaking, have been two-fold in answering the vexing question of '*Why not just call the plaintiff's bluff?*' In one group of models, the defendant is inclined to perceive the suit as a 'credible threat' such that the real NEV suit brought forward will proceed up to trial. This necessitates the existence of *some* mechanism for transforming the NEV suit into a 'positive expected value (PEV)' case. Accordingly, research was undertaken to develop PEV-generating models such as the models of asymmetric information and divisible litigation costs.[4]

However, this approach does not fit the kind of FS that we specified earlier. By the definition of obviously 'coerced transfers,' the suit should not be credible to the litigants for any reason. Thus, such a situation begs a theory other than the PEV-generating approach; particularly the environment of *complete information* should be presupposed. This very line of theory has been the second approach to explain FS, modeling it as a non-credible threat.[5] The traditional (or textbook-type) model and the model of Rosenberg and Shavell (1985) (hereafter **RS**) are the two representative attempts.

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[1] Only a few examples among many others, for instance, in the United States include *Pearson v. Chung* (05 CA 4302) where the plaintiff requested $67 million just for his allegedly lost pair of pants, a lawsuit seeking $ 1 million over a lost video game console ("Yale Student Sues Airline for $1M over Lost Xbox," *USA Today*, March 11, 2009), and a $160 million lawsuit after an incident related to cosmetic wax use ("Waxing Mishap Sparks 160 Million Lawsuit," *Fox News*, April 17, 2009).

[2] More precisely, FS is a *subset* of the NEV suits wherein the plaintiff's prevailing probability is almost zero. Thus, NEV suits in fact can include suits that are non-frivolous (or 'meritorious'). Nonetheless, we sometimes use the two terms, 'frivolous' and 'NEV', interchangeably for illustrative convenience.

[3] If the federal court, upon the defendant's motion, finds at the final judgment that the filing was frivolous, it then imposes the fee-shifting sanction on the violating plaintiff for the defendant's attorney's fees and other expenses directly from the violation. However, Rule 11's effectiveness appears to be rather controversial. See, for example, Kobayashi and Parker (1993), Yablon (1996), and Hart (2003) for further details of Rule 11.

[4] The asymmetric information models (e.g., Png, 1983; Bebchuk, 1988; Katz, 1990) turn to the plaintiff's ability to leverage the asymmetry. The next is the model of divisible litigation costs that are incurred continuously over time (Bebchuk, 1996). In addition to these two PEV-generating models, some other approaches are aligned closely with these models. One example is the trial-error model (e.g., Bebchuk and Chang, 1996; Bone and Evans, 2002).

[5] When we say that the FS is non-credible, it means that 'going to the final trial' is not credible (since the plaintiff's expected value from the trial is negative). It doesn't mean that filing a FS is not credible: If FS occurs at subgame perfect equilibrium, it means that filing FS is credible.

The traditional model, even if it can explain the occurrence of the non-credible FS, is not satisfactory because it does not allow a withdrawal option to the plaintiff. As shown later, if withdrawal is allowed as it is in reality, it cannot explain FS. In this sense, RS was pioneering because it explained NEV suits with the withdrawal option but without relying on the threat's credibility. However, the RS model is not robust in the sense that it needs a restrictive assumption; the defendant loses unless he defends himself at cost over the pre-trial process. In RS, the reason the defendant settles with the frivolous plaintiff is to avoid the early defense cost. This implies that RS cannot explain the occurrence of FS in other situations without default judgment.[6]

Thus, we need a more universal model than the traditional and RS models to explain the occurrence of FS even if 'going to the final trial' is definitely not a credible threat. This is the motivation of our paper. If we ask why people settle against FS, the usual answer might be "*It is because hanging on is too costly. We just want to get out from the harassing situation as soon as possible.*" The defendant settles with FS not because he is afraid of losing but because he wants to avoid 'some' costs incurring from not settling. In this regard, we summarize: the traditional model focuses on the 'trial cost,' and the RS model introduces the 'early defense cost.' We suggest in this paper that there is another more universal type of cost: i.e., the 'time cost' incurred until the case is completely cleared by settlement, withdrawal, or the court's decision. Specifically, we try to explain the occurrence of FS by using an infinite-period litigation game with uncertainty. Our model allows the withdrawal option but does not include the early defense cost, which can have a fairly peculiar connotation. Rather, we introduce uncertainty regarding when the final trial begins. We show that FS can occur as a subgame perfect equilibrium.

The order of the paper is as follows. In Section II, the two most representative models above are readdressed to demonstrate that FS can hardly be justified in finite-period game models under complete information. In Section III, we discuss uncertainty in terms of when the final trial begins, and show that FS can occur in an infinite-period litigation game with uncertainty. This analysis is further extended to the so-called British rule of fee shifting. Finally, Section IV summarizes the discussions and suggests judicial policy implications.

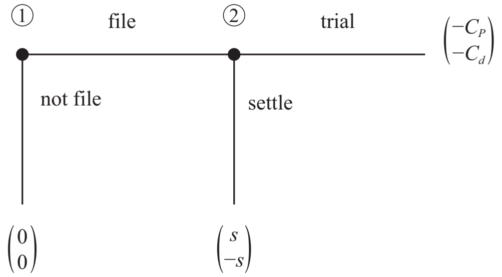
II. *Frivolous Suits in Finite-period Litigation Games*

1. The Traditional Litigation Model

Figure 1 shows that the 'traditional' (or textbook-type) model readily offers the possibility of coerced transfer, due to the desire of both parties to avoid a costly trial. The definitions of important parameters used are: $s=$ the settlement amount, $P=$ the plaintiff's winning probability, $M=$ the award at trial, $C_d=$ the defendant's trial cost, and $C_p=$ the plaintiff's trial cost. Although the NEV suit is defined as that with $PM-C_p<0$, we assume $P=0$ to highlight

[6] In RS and also in Rosenberg and Shavell (2006), the early defense cost has a fairly strong connotation since the defendant, without the defense, loses (i.e., receives default judgment). As Shavell (2004, p. 422) later recalled ("*This [RS] is the situation in a significant number of contexts, but is not the situation in many others*"), we intend to investigate some of these 'many other' contexts.

FIGURE 1. THE OCCURRENCE OF FS IN THE TRADITIONAL MODEL



Note: ①=plaintiff, ②=defendant.

the coercive nature of FS under consideration.[7]

The defendant, knowing that he will be lost by C_d in the trial, will settle for a lesser amount. Likewise, the plaintiff will agree on a settlement amount that exceeds $-C_p$, which is the expected net award at the trial. It follows that there will be a settlement with a Nash bargaining solution, $s^* = (C_d - C_p)/2$, as long as $C_d > C_p$. Proposition 1 then follows.

Proposition 1. (Cooter and Rubinfeld, 1989) *In the traditional litigation model with FS as in Figure 1, there is a unique subgame perfect equilibrium in which the plaintiff and the defendant, respectively, choose ('file', 'settle') if $C_d > C_p$, and ('not file', 'settle') if $C_d \leq C_p$. Further, the settlement amount under the Nash bargaining is $s^* = (C_d - C_p)/2$.*

The traditional model, however, has a limitation that it lacks a faithful abstraction of reality; it does not allow the plaintiff to withdraw before trial. Reflecting the litigating procedure in many countries, we should include the withdrawal option. Yet, once we allow withdrawal for the plaintiff, the model cannot explain the occurrence of FS. (This can be easily confirmed by backward induction.) Therefore, we need some other elements to explain FS when the plaintiff has a withdrawal option before trial as in the following RS model.

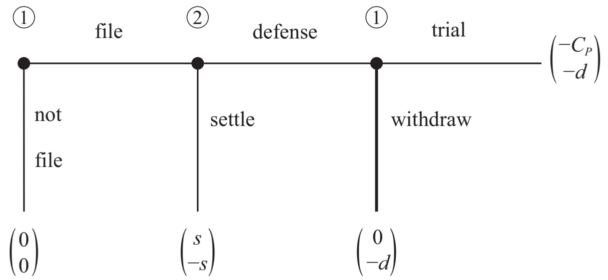
2. The RS Model and a Synthesis

Figure 2 depicts a slightly simplified version of RS, which is a two-person three-stage game with complete information. At the first stage, the plaintiff chooses between 'file' and 'not file.' The game is over if he chooses 'not file.' At the second stage, the defendant chooses between 'defense' and 'settle.' If the defendant chooses 'settle,' settlement bargaining starts and the settlement amount, s, will be determined endogenously by the bargaining process. On the other hand, if the defendant defends himself at a cost (d), the game moves on to the third stage where the plaintiff chooses between 'withdraw' and 'trial.' If the plaintiff does not withdraw, the case goes to trial.[8] The payoffs of the plaintiff and the defendant are indicated at each terminal

[7] The model currently assumes the American rule of fee shifting. However, remarks will always be made regarding the British rule.

[8] Although there was a filing cost in RS, we currently assume it to be zero for expositional convenience. We also

FIGURE 2. THE OCCURRENCE OF FS IN THE RS MODEL



Note: ①=plaintiff, ②=defendant.

node.

At the last stage, the plaintiff clearly will choose 'withdraw.' Knowing this, the defendant chooses 'settle' if $s \leq d$ and 'defense' if $s > d$. However, they will agree on bargaining with $s \leq d$. Then, knowing that the defendant will choose 'settle' with $s \leq d$, the plaintiff will 'file' FS at the first stage. Thus, the plaintiff will file FS and the case will be over with the defendant's paying a settlement amount of s to the plaintiff. s depends on the type of settlement bargaining between litigants. RS assumed ultimatum bargaining with the plaintiff's first move so that the settlement amount is $s^* = d$ as in Figure 2.[9]

Proposition 2. (Rosenberg and Shavell, 1985) *The RS model in Figure 2 has a unique subgame perfect equilibrium: the plaintiff's strategy is ('file', 'withdraw'), the defendant's strategy is 'settle,' and the settlement amount under the ultimatum bargaining is* $s^* = d$.

According to Proposition 2, even though it is common knowledge that the case is a FS such that 'going to the final trial' is non-credible, the defendant will settle simply because settling costs less than defending himself and making the plaintiff withdraw. It is the early defense cost, rather than the trial cost in the traditional model, which induces the defendant to settle with the plaintiff in the RS model.

However, the RS model is restrictive in the sense that the assumption—that the defendant loses automatically (i.e., the default judgment) at the pre-trial process unless he early defends himself at cost d — does not hold in many situations. Note that, in reality, d would have to be fairly high because, in order to strike a settlement, it needs to offset the initial costs such as various filing costs incurred on the part of the plaintiff. Accordingly, it is worthwhile to attempt to explain, without this restrictive 'early defense cost', why FS occurs in litigations with complete information. Now we turn to our main contribution to the literature.

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drop the default-judgment option (which was present along with the defense and settlement options in the game tree of RS) since that would not affect our main results. However, it should be emphasized that the critical assumption in the RS model is that the defendant loses unless he defends himself at cost d.

[9] Ultimatum bargaining is rather extreme in the sense that the first mover has absolute bargaining power. Refer, for instance, to Katz (1990, p. 4). If we assume a Nash bargaining under equal bargaining power, then the equilibrium settlement amount would be $s^* = d/2$.

III. *Frivolous Suits in Infinite-period Games with Uncertainty*

1. Uncertainty Regarding When the Final Trial Begins

Once FS is filed, the usual process is as follows. At the first stage, the plaintiff tries to induce settlement from the defendant, simply because it was the purpose of filing FS. If the defendant agrees and the case is settled, the game is over. If the defendant rejects plaintiff's settlement offer, the plaintiff should choose between withdrawing and continuing the litigation. The game is over if the plaintiff withdraws. However, if the plaintiff chooses not to withdraw, the litigation process moves on the next stage. Then what happens in the next stage is that either the court starts the final trial or the same pre-trial process as the first stage, that is, offer for settlement, accept or not, withdraw or continue, and so on, will be repeated. The game will continue in this way until the case is cleared by settlement, or withdrawal, or court's final trial. Litigants should pay trial costs if the case goes to the final trial, and also pay time costs as long as the pre-trial stage continues. The time cost here surely includes a variety of costs related to the passage of time.

The complexity of such process lies in the fact that litigants' choices are mutually interrelated. It is clear that the defendant's choice critically depends on that of the plaintiff. If the latter is thought to withdraw, the former will not settle. However, if there seems to be no withdrawal, the defendant will settle if the settlement amount is smaller than the time and/or trial cost of the ensuing future. Because the defendant should pay time costs while pre-trial stages continue along with (additional) trial cost if the case goes to the final trial, he will accept settlement offer by the plaintiff if it costs less. Meanwhile, the plaintiff's choice depends on his expectations about how soon the trial will begin. If it is certain that the trial begins tomorrow (or on some pre-determined future day), the plaintiff's optimal strategy is to withdraw now. It is because the defendant never settles knowing, by backward induction, that the plaintiff will withdraw before trial. However, if the plaintiff's expectation is opposite, the optimal strategy might be to delay withdrawal and try settlement again expecting that the defendant would settle in order to save the future costs incurred from 'not settling' now.

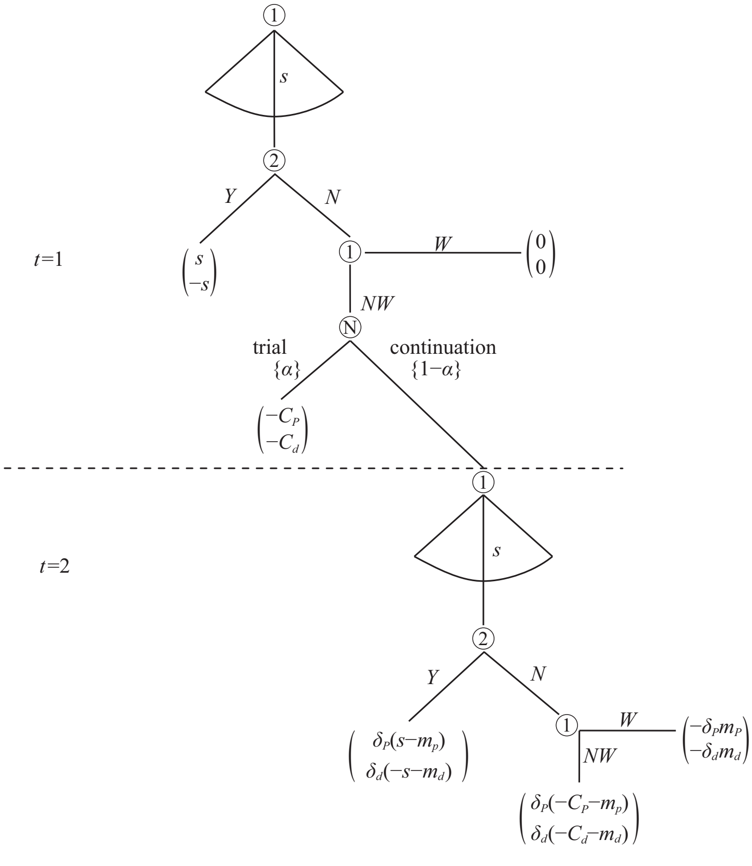
Therefore, whether or not the timing of trial is certain is critical in predicting the result of the litigation game with FS. We already confirmed in Section 2 that, if the trial date is pre-determined, FS cannot occur without further introducing, for example, an additional cost such as the early 'defense cost' of RS. However, if its timing is uncertain to the litigants, FS might occur at equilibrium as follows: if the litigants expect that the chance of the trial beginning tomorrow is low, the plaintiff will not withdraw today. The defendant, expecting this behavior, will accept the settlement offer to avoid the future time and/or trial costs.

Yet, we emphasize that this reasoning holds only in the infinite-period game. Assume instead a finite-period game with uncertainty in which, although when the trial begins is uncertain, the case should go to the trial at the last period unless it is cleared by then. In such games, the plaintiff will withdraw at the last period. The defendant, knowing this, will not settle. By backward induction, we then expect that FS will not be filed to begin with. Therefore, uncertainty itself cannot justify the occurrence of FS under the framework of a finite-period game. To better explain why FS occur in reality, we need an infinite-period framework together with uncertainty. If the length of the pre-trial process is not formally fixed, as it is in practice, or if a relevant legal clause is not strictly enforced, FS might occur due to the uncertainty concerning the exact timing of the trial. Below we formally examine these conjectures.

2. Finite-period Games with Uncertainty

Figure 3 describes a finite-period litigation game with uncertainty. The two-period model in Figure 3 can be extended to any finite number of periods. At $t=1$, the plaintiff offers a settlement amount, s, to the defendant. The defendant chooses between Y ('accept') and N ('reject'). If Y is chosen, the game is over with payoffs (s, $-s$). However, if N is chosen, the plaintiff should choose between W('withdraw') and NW ('not withdraw'). If he chooses W, the game is over. However, if NW is chosen, the case either goes to trial with probability $\alpha \in (0, 1)$, or moves on to the next period with probability $(1-\alpha)$. We assume that α is the same in every period and known to both litigants.

FIGURE 3. FINITE-PERIOD LITIGATION GAME WITH UNCERTAINTY



Note: ①=plaintiff, ②=defendant, Ⓝ=nature (court)

If the case goes to trial, the game will be over with payoffs $(-C_p, -C_d)$. Meanwhile, if the game is continued in the next period, the same game at $t=1$ will be repeated once more. However, at $t=2$, there is no further uncertainty regarding the continuation of the pre-trial process: i.e., it is certain that the case will go to trial at the last period if it is not cleared by then. We assume that the plaintiff and the defendant have discount factors, δ_p and δ_d, respectively. Finally, they bear per-period time costs, m_p and m_d, respectively, from $t=2$.

The subgame perfect equilibrium can be easily derived by backward induction. On the last information set at $t=2$, the plaintiff will choose W since the case is FS. Then, knowing this, the defendant will never settle with the plaintiff for any positive amount. Backward at $t=1$, the plaintiff will choose W because the expected payoff from NW $(=\alpha(-C_p)+(1-\alpha)(-\delta_p m_p))$ is always smaller than the zero payoff from W. Then, knowing this, the defendant will not agree to any positive settlement offer. To conclude, if the litigation game has an end-point, that is, if the date of final trial is predetermined, FS cannot occur even under uncertainty no matter how long the pre-trial process can continue. Such a result of the finite period litigation with uncertainty is summarized in Proposition 3.

Proposition 3. *If the litigation game is of finite-period which has an end-point, that is, if the date of final trial is predetermined, FS cannot occur even under uncertainty no matter how long the pre-trial process can continue.*

3. Infinite-period Games with Uncertainty

In reality, litigants often do not know precisely when the pre-trial process is over and the final trial begins, due to procedural complications such as congestion in courts, casual delays, an unexpectedly extended pre-trial discovery, or simply the judge's discretion.[10] Figure 4 depicts such realistic situations through an infinite-period game under uncertainty. The game structure is the same as that in Figure 3 with only one difference; there is no pre-determined end-point. The pre-trial process continues as long as the case is still in progress, and so the same game at $t=1$ commences at $t=2$ and onwards.

We assume that the per-period time costs are smaller than the trial costs. The assumption is not only realistic but feasible because we can make the length of the period as short as enough.

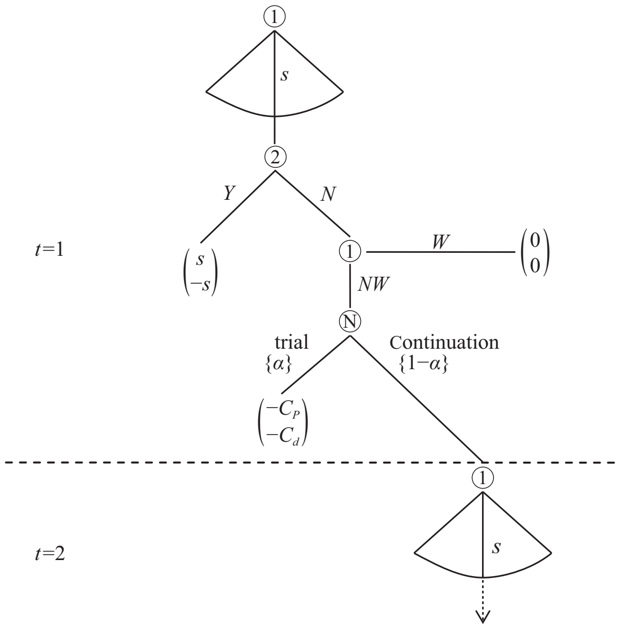
Assumption 1. $C_d, C_p > m_d, m_p$.

Since the same game is repeated each period, we will find a stationary subgame perfect equilibrium outcome such that, in each period, the plaintiff offers s^* and chooses NW if the offer is not accepted and the defendant chooses Y. If such equilibrium exists, it will provide a more satisfactory explanation about why FS occurs. Let the repetition of a set of these strategies, $((s^*, NW), Y)$, represent such an equilibrium outcome.

First, given the equilibrium strategy of the defendant and the settlement amount chosen by the plaintiff, the condition for the plaintiff to choose NW in any period t is expressed in (1). The

[10] For instance, according to Fenn and Rickman (1999) and other studies discussed therein, across many jurisdictions, there are considerable variations in the actual time taken for filed cases to go to trial. The World Bank's *Doing Business 2012* clearly provides substantial differences in the duration to complete a suit across 183 countries. See also Di Vita (2010) for a case study on delays in court decisions due to an increasing number of new and complex legislations.

FIGURE 4. INFINITE-PERIOD LITIGATION GAME WITH UNCERTAINTY



Note: ①=plaintiff, ②=defendant, Ⓝ=nature (court)

LHS of condition (1) is the expected return when the plaintiff chooses *NW*, while the RHS is the payoff when *W* is chosen. Note that, for condition (1) to hold, $s>m_p$ must hold and δ_p should be sufficiently large since $\alpha(-C_p)<0$.[11]

$$\alpha(-C_p)+(1-\alpha)(s-m_p)\delta_p\geq 0. \tag{1}$$

Next, the condition that the defendant will choose *Y* at *t* given the plaintiff's equilibrium strategy is summarized in (2). The LHS of (2) is the defendant's payoff from *Y* and the RHS is that from *N*.

$$-s\geq\alpha(-C_d)+(1-\alpha)(-s-m_d)\delta_d. \tag{2}$$

However, since the plaintiff can raise *s* by as much as the defendant can accept, condition (2) holds with equality in equilibrium. Thus, we obtain the equilibrium settlement amount s^* as in (3).

$$s^*=\frac{\alpha C_d+(1-\alpha)m_d\delta_d}{1-(1-\alpha)\delta_d}. \tag{3}$$

We also assume that the discount factors are sufficiently large for both litigants. If

[11] If $s<m_p$, then *NW* is not optimal even though there will be settlement tomorrow. And if δ_p is sufficiently small, then the game converges to the finite-period one so that the plaintiff will never choose *NW*.

contrarily discount factors are small, then the game becomes similar to the one-shot game and FS cannot be explained. Since we focus on the cases that the defendant settles against FS mainly to avoid time costs in this paper, discount factors should be large enough. Furthermore, again, as we can make the length of the period as short as enough, such assumption is not restrictive.

Assumption 2. $\delta_p=\delta_d=1$.

It should be emphasized again that Assumption 2 doesn't mean that litigants' discount factors are literally one. Our analysis holds for discount factors less than 1, as long as they are sufficiently large (or not too small).

Under Assumption 2, s^* can be rewritten as $s^*=C_d+[(1-\alpha)/\alpha]m_d$. Observation 1 is then made as follows.

Observation 1. Under Assumptions 1 and 2, $\partial s^*/\partial C_d>0$, $\partial s^*/\partial m_d>0$, and $\partial s^*/\partial\alpha<0$. *However, s^* is independent both of C_p and m_p.*

Observation 1 indicates that the settlement amount only depends on the defendant's costs, not on the plaintiff's costs. Generally, the settlement amount should depend on the time and trial costs of both litigants. However, because we assume an ultimatum bargaining with the plaintiff's offer in our model, it depends only on the defendant's cost, but not on the plaintiff's cost. Meanwhile, if α is close to one, the settlement amount becomes close to the defendant's trial cost, which is finite, even if the plaintiff does not withdraw. However, if α converges to zero, which implies that the pre-trial stage might continue forever, the settlement amount will be substantially large due to the accumulation of time costs. Thus, the settlement amount decreases with α. Now, Condition (1) is transformed to (4).

$$f(\alpha)=\alpha(-C_p)+(1-\alpha)(s^*-m_p)\geq 0. \tag{4}$$

Under Assumptions 1 and 2, it is easy to confirm that $f(0)>0$, $f(1)<0$, and $f'(\alpha)=-C_p-(s^*-m_p)+(1-\alpha)(\partial s^*/\partial\alpha)<0$. Thus, there exists $\alpha^*\in(0, 1)$ such that $f(\alpha)\geq 0$ for $0<\alpha\leq\alpha^*$. That is, condition (4) holds for $0<\alpha\leq\alpha^*$. In summary, for $0<\alpha\leq\alpha^*$, $((s^*, NW), Y)$ is the stationary equilibrium such that the plaintiff offers s^* and the defendant will accept it. Consequently, FS is settled at $t=1$. Proposition 4 then follows.[12]

Proposition 4 *Suppose an infinite-period game under uncertainty as in Figure 4 where $\alpha\in(0, 1)$ is the probability that the case goes to trial every period. Under Assumptions 1 and 2, if $\alpha\leq\alpha^*$, the repetition of $((s^*, NW), Y)$ in each period is a subgame perfect equilibrium outcome, where α^* satisfies $f(\alpha^*)=\alpha^*(-C_p)+(1-\alpha^*)(s^*-m_p)=0$ and $s^*=C_d+[(1-\alpha^*)/\alpha^*]m_d$. FS is filed and settled at $t=1$.*

According to Proposition 4, when the probability that the (presently unresolved) case will pass to the next period is perceived to be relatively high, the defendant tends to settle in order to save on future time and/or trial costs. Also, the plaintiff, anticipating this, files FS and does not withdraw. FS thus can result in a settlement.

[12] Surely, if $\alpha>\alpha^*$ contrary to the case in Proposition 4, the plaintiff will withdraw, and the defendant, knowing this, will not accept the plaintiff's settlement offer. FS then will not be filed.

To be sure, the litigants' costs affect the frequency of the occurrence of FS. As C_p and/or m_p decrease, or as C_p and/or m_d increase, the range of α which satisfies condition (4) becomes larger. That will raise the chance that FS occurs. Proposition 5 summarizes such comparative static analyses regarding the possibility of FS depending on litigants' costs, where α^* represents the possibility of FS.

Proposition 5 *Major comparative-statics results for* α^* *in Proposition 4 are as follows:* $\partial\alpha^*/\partial C_d > 0$, $\partial\alpha^*/\partial C_p < 0$, $\partial\alpha^*/\partial m_d > 0$, *and* $\partial\alpha^*/\partial m_p < 0$.

It is worth noting an intriguing fact that this infinite-period model with uncertainty might be construed as a direct extension of the NEV-suit model in RS in Figure 2: The latter model is being repeated every period in Figure 4. Yet, a substantial difference is that, unlike RS, failure in settlement does *not necessarily* result in the plaintiff's immediate withdrawal. Rather, in our model, the litigants know only stochastically whether–conditional upon the plaintiff's not withdrawing–the pre-trial process will be finished or the same game will resume in the next period. Indeed, the more fundamental difference is that FS can be explained without introducing the 'early defense cost' in RS.

4. Further Discussions

An additional remark appears to be beneficial for the extant stock of literature. We have thus far assumed the so-called 'American Rule (hereafter **AR**)' in fee shifting. Under the 'British Rule (hereafter **BR**)', there is a smaller chance of settlement in the case of FS due to the internalizing feature of fee-shifting. For instance, FS does not occur *at all* both under the traditional and RS models. By contrast, FS can take place in our infinitely repeated game with uncertainty.

Under BR, trial costs are all 0 for the defendant and $C_p + C_d$ for the plaintiff. Then the equilibrium amount of settlement is $s^* = [(1-\alpha)/\alpha]m_d$ from equation (3). The defendant settles even under BR to avoid future time costs incurring in case of not settling. Thus, under BR, the condition that the plaintiff chooses NW, i.e, inequality (4), changes to $f(\alpha) = \alpha(-C_p - C_d) + (1-\alpha)(s^* - m_p) \geq 0$. Since $f(0) > 0$, $f(1) < 0$, and $f'(\alpha) < 0$ as under AR, there exists $\alpha^* \in (0, 1)$ such that $f(\alpha) \geq 0$ for $0 < \alpha \leq \alpha^*$. Note that the condition for the existence of this equilibrium under AR ($s^* - m_p > 0$) converts to $[(1-\alpha)/\alpha]m_d > m_p$ under BR, which will occasionally be met considering the facts that FS takes place mostly with a small value of α and that the inequality, $m_d > m_p$, often holds in reality. Therefore, FS can take place even under BR although its likelihood is lower than under AR as summarized in Proposition 6.[13]

Proposition 6 *Assume BR instead of AR in the infinite-period litigation game under uncertainty in Figure 4. If* $[(1-\alpha)/\alpha]m_d > m_p$ *and* $\alpha \leq \alpha^*$, *FS occurs; that is, the repetition of ((*s^**, NW), Y) in each period is a subgame perfect equilibrium outcome, where* α^* *satisfies* $f(\alpha^*) = -\alpha^*(C_p + C_d) + (1-\alpha^*)(s^* - m_p) = 0$ and $s^* = [(1-\alpha^*)/\alpha^*]m_d$.

[13] Although the vast majority of the literature compared the effects of AR and BR in a discrete fashion, our survey reveals that, in reality, the rule most probably would lie in between them (i.e., partial fee-shifting). Therefore, Proposition 5 implies that the current model has explanatory power more universally across countries.

IV. *Summary and Policy Implications*

The 'frivolous suit (FS),' which is a subset of negative expected value suits, is merely a bluff because it is common knowledge among the litigants that the plaintiff clearly loses if the case goes to trial. Nonetheless, we frequently observe filings of FS and subsequent settlements with these frivolous plaintiffs. Two basic questions then are important. First, why does the defendant settle in spite of the sure winning chance at the trial? Second, how can we prevent such socially undesirable suits? This paper is primarily concerned with the first question. In particular, we focus on the *complete-information* situation among the litigants to highlight the perverse nature of FS; with complete information FS is a simple coerced transfer among the economic agents through exploiting exiting legal institutions.

As to FS under complete information, there have been two representative explanations. One is the traditional model and the other is the RS model. However, neither of these is sufficiently satisfactory. In the traditional model, the plaintiff cannot withdraw after a case is filed. Clearly, this is not a realistic model specification at least in coping with the FS phenomenon; once we allow a withdrawal option, the traditional model cannot explain the occurrence of FS. The RS model, which allows the plaintiff's withdrawal, justifies FS by adopting an assumption that the defendant loses immediately unless he early defends himself at cost during the pre-trial process. It is this early defense cost that induces the defendant to settle with an amount smaller. However, the RS model is not universal because there are numerous other situations where the RS assumption does not hold.

In this paper, in seeking a more generalized explanation regarding the occurrence of FS under complete information, we have provided an infinite-period litigation game under uncertainty. If the litigants are uncertain regarding when the final trial begins, which we believe is a realistic situation in many occasions, then the defendant might have an incentive for settlement to save future time and/or trial costs which should incur if settlement is not chosen now. We have shown that, under such an infinite-period game without a deterministic end-point for the pre-trial process, the occurrence of FS can be a subgame perfect equilibrium outcome. It has also been demonstrated that this result may hold even under the British rule of fee shifting.

Indeed, it remains to be empirically verified that there are more settlements with FS when courts are operated inefficiently or with much uncertainty. To the extent that this setting might reflect the reality reasonably well, however, we have been able to offer a universal explanation that FS can arise even in the absence of the early defense cost. This might be construed as one important example of the "*many others*" (Shavell, 2004, p. 422) mentioned earlier. In addition, a beneficial policy implication is drawn. It can be an effective deterrent against coercive transfers to make the maximum length of the pre-trial process stricter because casual delays and judge's discretion are then minimized. This initiative will reduce the uncertainty regarding the time-related costs for the litigants.

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