Costly Pretrial Agreements*

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Abstract. Settling a legal dispute involves some costs that the parties have to incur *ex-ante*, for the pretrial negotiation and possible agreement to become feasible. Even in a full information world, if the distribution of these costs is sufficiently mismatched with the distribution of the parties' bargaining powers, a pretrial agreement may never be reached even though actual Court litigation is overall wasteful.

Our results shed light on two key issues. First, a Plaintiff may initiate a law suit even though the parties fully anticipate that it will be settled out of Court. Second, the "likelihood" that a given law suit goes to trial is unaffected by how trial costs are distributed among the litigants. The choice of *fee-shifting rule* can only affect whether the Plaintiff files a law suit in the first place. It does not affect whether it is settled before trial or litigated in Court.

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1. Introduction

1.1. Overview

Potential legal disputes become actual ones when a Plaintiff ($\mathcal{P}$ throughout the rest of the paper) files a suit against a Defendant ($\mathcal{D}$ throughout the rest of the paper).[1] After a suit is filed, it can either be settled before it goes to Court, or it can be actually litigated in Court. Throughout the process $\mathcal{P}$ can drop the suit at any point in time. Our highly stylized model below captures these basic elements.

Court litigation is generally a wasteful way to resolve disputes as it involves large costs. Settling out of Court also involves costs, but these are generally lower than Court costs, and this is what we will assume throughout. The fact that these costs are present is often ignored, but plays a key role in our analysis.

If Court litigation is inefficient, and the parties are fully informed, is there a good reason for a law suit to be ever litigated in Court? Will it not be the case that some version of the Coase theorem (Coase, 1960) prevents Court litigation from ever actually taking place?

We present here a robust reason for some disputes between rational fully informed parties to be inefficiently litigated in Court.

Our model also sheds light on two key features of how disputes are initiated and subsequently handled.

First, in some cases $\mathcal{P}$ will initiate a law suit even though he fully anticipates that it will be settled out of Court. Very roughly speaking this is because filing a suit changes the outcome in case of disagreement in the bargaining process leading to the out-of-Court settlement.

Second, contingently on $\mathcal{P}$ deciding to actually file a law suit against $\mathcal{D}$, the "likelihood" that it is litigated in Court versus settled out of Court does *not* depend on how the Court costs are apportioned between $\mathcal{P}$ and $\mathcal{D}$, but only on the *total* Court litigation costs. In other words, the choice of *fee-shifting rule* does not affect whether a given suit is settled before trial or litigated in Court.[2] This is because the the parties' negotiation will fully anticipate and compensate any shift in the Court costs, which will be fully reflected in the amount that $\mathcal{P}$

[1] Of course, there could be multiple Plaintiffs and/or multiple Defendants, but this is not our focus here.

[2] We consider the four systems discussed by Shavell (1982): the American rule (each side bears its own costs), the English rule (the losing side bears all costs), the rule favoring the Plaintiff (he pays only his own cost if he loses and nothing otherwise), and the rule favoring the Defendant (she pays only her own costs if she loses and nothing otherwise).

pays $\mathcal{D}$ *if* the suit is settled out of Court. Fee-shifting, however, can affect whether $\mathcal{P}$ files a law suit in the first place.

So, why do some disputes between fully informed parties end up being inefficiently litigated in Court? As we noted above this requires a failure of the Coase theorem.

The bare-bones mechanism that generates a failure of the Coase theorem in this paper is similar to what happens in a rather different context in Anderlini and Felli (2006). Key to our result is the observation that parties to a dispute may have to incur certain costs prior to any potential settlement negotiation. That is, parties may have to pay *ex-ante transaction costs* (for example invest some time) to prepare for the negotiation that might lead to a settlement. The need to incur these costs prior to the negotiation implies that these costs are sunk by the time the pretrial negotiation takes place and hence they will not be taken into account in the negotiation. What this means is that the parties find themselves in a version of the hold-up problem. In other words, it is the parties' strategic interaction in the presence of *ex-ante* costs that might lead to trial. We regard this rationale for fully rational agents to end up in Court as complementary to existing explanations, based on the parties' disagreement over the likelihood of prevailing at trial or the inefficiency associated with parties' private information.

The vast literature on litigation, pretrial negotiation and fee shifting began with the economic theory of litigation, developed by Landes (1971), Posner (1973) and Gould (1973). These authors concluded that risk perception is the main determinant of whether a case is settled outside of Court. Together with Shavell (1982) these papers explain costly litigation as the result of different views on the likelihood of prevailing at trial. In this setting fee-shifting amplifies the effect of optimism, making litigants less likely to settle. "Under the English rule, a litigant is forced to take into account the other side's litigation costs to the extent that she risks losing the case, making her more willing to settle. But conversely, she is freed of her own litigation cost to the extent that she hopes to win, making her less likely to settle. Since litigants are disproportionately drawn from the population of optimists, the latter effect tends to outweigh the former. Indeed, in the limiting case when both parties are fully confident of winning, neither expects to pay any costs at all and settlement is impossible" (Katz and Sanchirico, 2012, p. 14).[3] This literature has been criticized on the ground that it assumes

[3] More recently other papers have extended this setting by endogenizing the level of trial expenditures should a trial take place (see Braeutigam, Owen, and Panzar (1984), Plott (1987), Cooter and Rubinfeld (1989) and Froeb and Kobayashi (1996))

that each party knows the other party's reservation value.

A second group of models has focussed on disagreements generated by the parties' private information, allowing for rational beliefs (Bebchuk, 1984, Dari-Mattiacci and Saraceno, 2015, Nalebuff, 1987, P'ng, 1983, Schweizer, 1989, Spier, 1992, 1994b) and explored the effects of fee-shifting rules (Gong and McAfee, 2000, Reinganum and Wilde, 1986, Spier, 1994a). Asymmetric information models confirm the disagreements model's result that the English rule generally discourages settlement when the private information concerns the likelihood of the plaintiff's prevailing at trial (Bebchuk, 1984), but provide exactly the opposite prediction when the asymmetric information is on the opponent's litigation costs (Chopard, Cortade, and Langlais, 2010) or on the level of damages suffered by the plaintiff (Reinganum and Wilde, 1986).

We are not the first to conclude that the likelihood of a trial is independent of the fee-shifting rule. Reinganum and Wilde (1986), Donohue (1991a,b) and, more recently, Dari-Mattiacci and Saraceno (2015) reach the same conclusion. The probability of trial is only a function of the total litigation costs and different fee-shifting rules do not alter this probability. In particular, in Donohue (1991a,b) the irrelevance of fee-shifting rules is a direct consequence of the Coase theorem: rules are irrelevant as long as the involved parties are free to sign a private contract specifying the Pareto optimal rule applicable to the court.[4] What is surprising is that we find the same result in a setting where the Coase Theorem does not hold precisely because parties have to incur some *ex-ante* costs, before they reach the stage in which the actual negotiation occurs.

Finally, Hubbard (2015) analyzes the effects of sinking trial costs at an ex-ante stage in order to force or deter settlement. Like the present paper, Hubbard (2015) is based on a complete information model. Unlike what happens here all suits are settled out of Court. We return to the relationship between Hubbard (2015) and our work in Subsection 6.2 below.

1.2. Outline

The rest of the paper is organized as follows. To help the intuition concerning some of the key insights, in Section 2 we provide an illustrative numerical example of our full-fledged model. In Section 3 that follows we describe the model in full detail. In Section 4 we characterize the (generally unique) equilibrium of the model as a function of its parameters (the pretrial

[4]The fact that the parties have come to litigation in the first place, may cast doubts on the presumption that they are bargaining in a Coasian fashion though (Katz and Sanchirico, 2012, p. 5).

and trial costs among others). Section 5 is devoted to a discussion of fee-shifting rules, and includes full description of the four polar cases that we consider. In Section 6 we discuss the implications of our characterization of Section 4 in terms of the impact of changes in the parameters and fee-shifting rules on the equilibrium outcome of the model. In Section 7 we summarize and contrast our findings vis-à-vis related model with asymmetric information. Section 8 briefly concludes. Seeking a more streamlined exposition we have gathered some formal material in an Appendix.[5]

2. A Numerical Example

2.1. Set-Up

The Plaintiff $\mathcal{P}$ files a suit against Defendant $\mathcal{D}$. If the case goes to trial, $\mathcal{P}$ will receive expected damages of $\mathcal{I} = 100$. In what follows, we will distinguish between the actual damages if $\mathcal{P}$'s suit is successful, denoted by I, and the probability that $\mathcal{P}$ wins, denoted by p. Clearly, $\mathcal{I} = pI = 100$.

A pre-trial settlement is possible if and only if both parties pay the costs necessary to enter a pre-trial negotiation equal to $c_A^{\mathcal{P}} = 10$ and $c_A^{\mathcal{D}} = 10$. If either or both do not pay such costs, the suit is litigated in Court. In this case $\mathcal{P}$ incurs a cost of $c_T^{\mathcal{P}} = 20$, while $\mathcal{D}$ incurs a cost of $c_T^{\mathcal{D}} = 20$.[6] Clearly litigating in Court is inefficient since it is associated with a total cost $c_T = c_T^{\mathcal{P}} + c_T^{\mathcal{D}} = 20 + 20 = 40$, while a pre-trial settlement is associated with a lower total cost $c_A = c_A^{\mathcal{P}} + c_A^{\mathcal{D}} = 10 + 10 = 20$.

To drive home the main point, we need to consider two different distributions of bargaining power across $\mathcal{P}$ and $\mathcal{D}$. Let β be the bargaining power of $\mathcal{P}$ and $1 - \beta$ that of $\mathcal{D}$. We consider the case of $\beta = 1/2$ and the case of $\beta = 1/10$. In other words, in one case the bargaining power is "evenly distributed," while in the other it is skewed in favor of $\mathcal{D}$.[7]

Plugging these values for the bargaining power in the generalized Nash bargaining that will be specified later (see Section A.1 for details), we obtain that the size of the settlement $\mathcal{S}$, if a pre-trial agreement is achieved, are $\mathcal{S} = 100$ if $\beta = 1/2$, and $\mathcal{S} = 84$ if $\beta = 1/10$.

[5]All items whose number begins with a prefix "A" are to be found in the Appendix.

[6]We have picked equal cost values across $\mathcal{P}$ and $\mathcal{D}$ purely for simplicity.

[7]What matters here is that costs are equal across $\mathcal{P}$ and $\mathcal{D}$ while, in one case, bargaining power is skewed. Whether it is skewed in favor of $\mathcal{P}$ or $\mathcal{D}$ does not matter at all.

2.2. Outcomes

We begin with the case $\beta = 1/2$, which as we noted implies a settlement of $\mathcal{S} = 100$. Intuitively, in this case the values the of pre-trial negotiation costs and of bargaining power are "aligned" — they are both evenly distributed across $\mathcal{P}$ and $\mathcal{D}$.

If both $\mathcal{P}$ and $\mathcal{D}$ pay their pre-trial agreement costs the case is settled out of court with $\mathcal{S} = 100$. Hence in this case $\mathcal{D}$ ends up with a payoff of $-\mathcal{S} - c_A^{\mathcal{D}} = -100 - 10 = -110$. As for $\mathcal{P}$, the payoff in this case is $\mathcal{S} - c_A^{\mathcal{P}} = 100 - 10 = 90$. If either side does not pay their pre-trial agreement cost, then the case is litigated in Court. The payoff from deviation for $\mathcal{D}$ is $-\mathcal{I} - c_T^{\mathcal{D}} = -100 - 20 = -120$. The payoff from deviation for $\mathcal{P}$ instead is $\mathcal{I} - c_T^{\mathcal{P}} = 100 - 20 = 80$. Hence neither $\mathcal{P}$ nor $\mathcal{D}$ finds it profitable to deviate and the case is settled out of Court.[8]

Next, consider the case in which $\beta = 1/10$. If both $\mathcal{P}$ and $\mathcal{D}$ were to pay their pre-trial agreement costs the case is settled out of court. In this case the new value of $\mathcal{S}$ is 84. Hence in this case $\mathcal{D}$ ends up with a payoff of $-\mathcal{S} - c_A^{\mathcal{D}} = -84 - 10 = -94$ while the payoff of $\mathcal{P}$ is $\mathcal{S} - c_A^{\mathcal{P}} = 84 - 10 = 74$.

The payoff for $\mathcal{P}$ if he decides not to participate in the settlement negotiation by not paying cost $c_A^{\mathcal{P}}$ and go to court is $\mathcal{I} - c_T^{\mathcal{P}} = 100 - 20 = 80$. So, in this case $\mathcal{P}$ finds it profitable to deviate from paying $c_A^{\mathcal{P}}$. It follows that a pre-trial agreement is *not* possible in equilibrium and hence that the case will be litigated in Court yielding a payoff of $-\mathcal{I} - c_T^{\mathcal{D}} = -100 - 20 = -120$ for $\mathcal{D}$ and a payoff of $\mathcal{I} - c_T^{\mathcal{P}} = 100 - 20 = 80$ for $\mathcal{P}$.

Two comments are in order. First, the outcome when $\beta = 1/10$ and the case is litigated in Court is inefficient. This stems directly from the fact that the total litigation costs incurred in this case $c_T = 40$ are greater than the total costs $c_A = 20$ needed for a pre-trial negotiation. Second, the inefficiency when $\beta = 1/10$ is due to the "misalignment" between the distribution of pre-trial agreement costs and bargaining power. In this case the low bargaining bargaining power of $\mathcal{P}$ skews the settlement $\mathcal{S}$ and hence does not make it worthwhile for $\mathcal{P}$ to settle out of court, even though $c_A^{\mathcal{P}} = 10 < c_T^{\mathcal{P}} = 20$.

Before finishing our numerical example we highlight that our choice of values is such that, regardless of β, it is in $\mathcal{P}$'s interest to file suit against $\mathcal{D}$ — in both cases $\mathcal{P}$'s payoff is positive. Clearly, this needs not be the case as costs and damages vary. The decision to file or not to

[8] Notice that a "coordination failure" could lead to neither side paying and the case being litigated in Court. This is something that cannot happen in the full-fledged model below.

file plays an important role in what follows. The channels that affect the decision to file were deliberately shut-down in this example so as to focus on the role that negotiation costs and the parties' bargaining power play in determining whether a settlement is achieved even if it is efficient to do so.

3. The Model

3.1. Court Costs and Pretrial Agreement Costs

We start by taking it as given that a suit has in fact been filed. We also abstract from the possibility that $\mathcal{P}$ could drop the suit after filing it, which instead will be considered at every stage of the timeline below. All parties are risk-neutral.

At this stage it is useful to summarize our notation and write down the payoffs to the players as a consequence of the pretrial costs being paid or not, and the suit being litigated in Court or settled beforehand.[9]

	Pay $c_A^{\mathcal{D}}$	Not Pay $c_A^{\mathcal{D}}$
Pay $c_A^{\mathcal{P}}$	$\mathcal{S} - c_A^{\mathcal{P}},\ -\mathcal{S} - c_A^{\mathcal{D}}$	$\mathcal{I} - c_A^{\mathcal{P}} - c_T^{\mathcal{P}},\ -\mathcal{I} - c_T^{\mathcal{D}}$
Not Pay $c_A^{\mathcal{P}}$	$\mathcal{I} - c_T^{\mathcal{P}},\ -\mathcal{I} - c_A^{\mathcal{D}} - c_T^{\mathcal{P}}$	$\mathcal{I} - c_T^{\mathcal{P}},\ -\mathcal{I} - c_T^{\mathcal{D}}$

Table 1: Summary of Payoffs

The first assumption we make stipulates that a pretrial agreement is efficient. In particular, both parties are potentially better off by avoiding a costly trial.

Assumption 1. *Efficiency of Pre-Trial Agreements: The total cost of a pre-trial agreement is lower than the total cost of going to Court. In other words $c_T > c_A$.*

Assumption 1 implies that negotiating a settlement and not going to trial generates a positive surplus $c_T - c_A$. Notice however that *after* the costs c_A^i are *sunk*, the only relevant cost during the negotiation is c_T, the total amount the parties can save by not going to Court. The settlement negotiated in the pre-trial agreement $\mathcal{S}$ is then the outcome of Generalized Nash bargaining between $\mathcal{P}$ and $\mathcal{D}$ over a surplus of size c_T. We return to the details of the bargaining in Subsection 3.3 below.

[9] Notice that although Table 1 is reminiscent of a normal form game, it is not one since the choices are taken sequentially in a way to be specified below.

Before we proceed further, it is important to emphasize again that the pretrial agreement costs in our set up are *ex-ante costs*, exactly as in Anderlini and Felli (2006). The key feature of these costs is that they are *sunk* by the time the settlement negotiation begins and as such they are not the subject of negotiation. Notice however that these costs are critical in each party's decision whether to participate in the pretrial negotiation or to go to Court.

The prime example of these costs is associated with the fact that in order to reach the negotiation stage the parties have to invest cognitive and examination effort and clear their schedules in order to meet, that clearly carries an opportunity cost given by the value of their alternative use of time.

An obvious question is then what happens to our set up if at least part of these *ex-ante* costs can be paid at a later stage, after the pretrial negotiation has taken place. The answer is that provided at least part of these costs cannot be postponed the qualitative nature of our results is unaffected. We return to this issue in Subsection 6.2 below.

3.2. Timeline

The timeline of decisions is represented schematically in Figure 1 below.[10] In addition to what we discussed in Subsection 3.1, here we see that the parties have the chance to pay the pretrial negotiating costs *sequentially* (with $\mathcal{D}$ choosing first) and that $\mathcal{P}$ has the opportunity to drop the suit at every stage. Importantly, we now also introduce an initial node where $\mathcal{P}$ decides whether or not to file a suit against $\mathcal{D}$.

At time $t = 0$, the plaintiff $\mathcal{P}$ decides whether to sue the defendant $\mathcal{D}$. If $\mathcal{P}$ decides not to file suit the game ends and all parties get their outside option normalized to zero. If instead $\mathcal{P}$ decides to sue $\mathcal{D}$ the game moves to the following period $t = 1$.

At $t = 1$, $\mathcal{D}$ decides whether to pay the pretrial negotiating cost $c_A^{\mathcal{D}}$ discussed in Subsection 3.1 above.[11] If $\mathcal{D}$ decides to pay, the game moves to time $t = 2$. If $\mathcal{D}$ decides instead not to pay, the move goes to $\mathcal{P}$ who decides whether to drop the suit or not. If $\mathcal{P}$ drops the suit

[10]Notice that the tree in Figure 1 is not an extensive form game in the ordinary sense of the term. The reason is that at the top right node we have generalized Nash bargaining taking place. This is depicted as "both" players taking action at that point, and this is clearly not admissible in a standard extensive form game. For added emphasis, the lines following this node are dotted lines instead of solid ones.

[11]The choice of giving $\mathcal{D}$ (as opposed to $\mathcal{P}$) the choice to pay the pretrial negotiation cost first is inessential. The fact that the choices of whether to pay these costs are sequential (as opposed to simultaneous) is not. In particular it simplifies the analysis by avoiding the emergence of a possible coordination failure equilibrium in which neither party pays simply because it expects the other side not to pay (Anderlini and Felli, 2006).

both $\mathcal{P}$ and $\mathcal{D}$ earn a payoff of zero.[12]

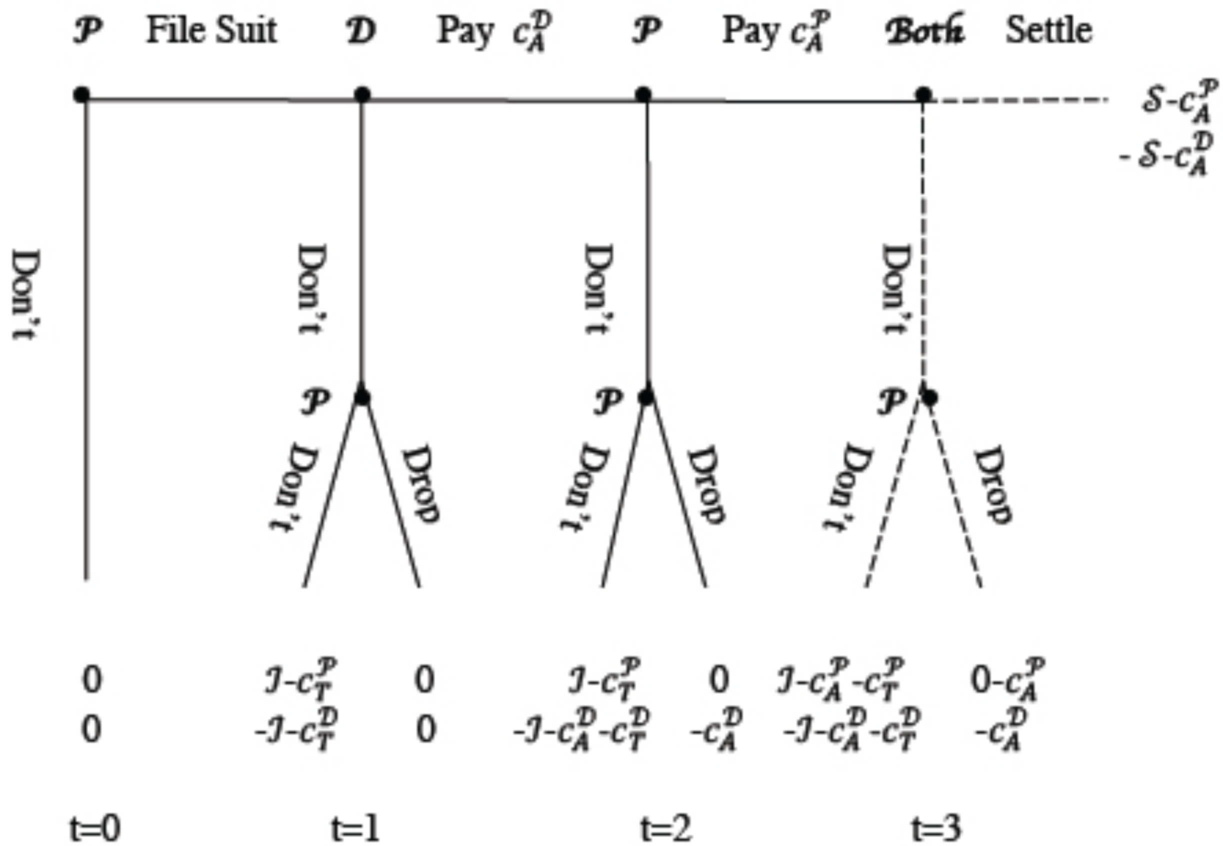

Figure 1: Timeline

If $\mathcal{P}$ does not drop the suit, the dispute is litigated in Court. In this case, as we discussed above the payoffs for $\mathcal{P}$ and $\mathcal{D}$ are $\mathcal{I} - c_T^{\mathcal{P}}$ and $-\mathcal{I} - c_T^{\mathcal{D}}$ respectively.

At $t = 2$, it is $\mathcal{P}$ who decides whether to pay his pretrial negotiating cost $c_A^{\mathcal{P}}$. If $\mathcal{P}$ decides to pay, a pretrial bargaining negotiation become feasible, and the game moves to $t = 3$. Symmetrically to the previous node, if $\mathcal{P}$ decides not to pay, he then gets the chance to drop the suit or not. If the suit is dropped $\mathcal{P}$ ends up with a payoff of 0, while $\mathcal{D}$ earns a payoff of $-c_A^{\mathcal{D}}$.

If $\mathcal{P}$ does not drop the suit, the dispute is tried in Court. In this case, the payoffs for $\mathcal{P}$ and $\mathcal{D}$ are $\mathcal{I} - c_T^{\mathcal{P}}$ and $-\mathcal{I} - c_A^{\mathcal{D}} - c_T^{\mathcal{D}}$ respectively.

[12]If $\mathcal{P}$ were to incur a positive cost to drop the suit, there would be no qualitative changes in our results.

3.3. *Generalized Nash Bargaining and The Disagreement Payoffs*

If $\mathcal{P}$ files a suit against $\mathcal{D}$ and both parties pay their pretrial negotiating costs, a pretrial bargaining negotiation becomes feasible. The game moves to $t = 3$, and we are at the top right-most node in Figure 1. To conclude the description of the model, we need to flesh out what happens following this node.

The parties will bargain over the surplus created by avoiding a costly trial, namely $c_T = c_T^{\mathcal{P}} + c_T^{\mathcal{D}}$. Notice that *all* of c_T is "up for grabs" in the generalized Nash bargaining since $c_A^{\mathcal{P}}$ and $c_A^{\mathcal{D}}$ are *sunk* by the time the bargaining takes place.

The dotted lines branching out of the top right-most node in Figure 1 should be interpreted as follows. As the time to strike a deal approaches the process can in principle break down, and the parties will obtain their disagreement payoffs.[13] However, should the Nash bargaining veer towards the disagreement, $\mathcal{P}$ always retains the option of dropping the suit. If $\mathcal{P}$ decides not to drop the suit, it will be litigated in Court, and the disagreement payoffs for $\mathcal{P}$ and $\mathcal{D}$ will therefore be $\mathcal{I} - c_A^{\mathcal{P}} - c_T^{\mathcal{P}}$ and $-\mathcal{I} - c_A^{\mathcal{D}} - c_T^{\mathcal{D}}$ respectively. If instead $\mathcal{P}$ drops the suit, there will be no transfer between the parties. Given the costs already incurred in this case the disagreement payoffs for $\mathcal{P}$ and $\mathcal{D}$ will therefore be $-c_A^{\mathcal{P}}$ and $-c_A^{\mathcal{D}}$ respectively.

Should the generalized Nash bargaining break down, $\mathcal{P}$ will not drop the suit and actually go to Court if and only if:[14]

$$\mathcal{I} - c_T^{\mathcal{P}} > 0 \tag{1}$$

As we show in the Appendix (see Section A.1 and in particular Remark A.1), this means that, contingently on reaching the top right-most node in Figure 1, the parties' dispute will be settled out of Court with $\mathcal{S}$ determined as follows. If (1) is satisfied then

$$\mathcal{S} = \mathcal{I} + \beta\, c_T^{\mathcal{D}} - (1-\beta)\, c_T^{\mathcal{P}} \tag{2}$$

If on the other hand (1) is violated then $\mathcal{S} = 0$.

[13] It should be noted that in a generalized Nash bargaining situation the possibility of disagreement is purely counterfactual, provided that an agreement yields positive surplus relative to the disagreement point. In our case, the fact that the surplus from an agreement is positive is guaranteed by Assumption 1. The distinction between Nash disagreement and extensive form outside options has been scrutinized before in considerable detail within contract theory. See for instance De Meza and Lockwood (1998).

[14] We assume that when $\mathcal{P}$ is indifferent, he chooses not to go to Court. This is completely inessential, but somehow it seems the natural route to follow.

4. Characterization

4.1. The decision to Settle

As we note in some detail in the Appendix (Section A.3), (1) is a *necessary* condition for $\mathcal{P}$ to file a suit against $\mathcal{D}$.

Assume then that (1) is in fact satisfied. A settlement out of Court is feasible if and only if the parties reach the top right-most node in Figure 1, meaning that $\mathcal{P}$ did file a suit, and that subsequently $\mathcal{D}$ and $\mathcal{P}$ paid their ex-ante pretrial negotiating costs.

Effectively, settlement out of Court means that the parties split the total surplus c_T generated by the fact that Court costs are not incurred according to their bargaining powers β and $1 - \beta$.[15] This will be convenient for *both* $\mathcal{P}$ and $\mathcal{D}$ if and only if

$$\beta\, c_T \;\geq\; c_A^{\mathcal{P}} \qquad \text{and} \qquad (1-\beta)\, c_T \;\geq\; c_A^{\mathcal{D}} \tag{3}$$

Notice that (3) says precisely that the gain from not going to Court should be no less than the ex-ante cost of a pretrial agreement for *both* $\mathcal{P}$ and $\mathcal{D}$.[16]

We conclude our characterization of the decision to settle out of Court by noticing that if either of the two inequalities in (3) is violated, then the suit will not be settled and will not be dropped. It will be adjudicated in Court because $\mathcal{P}$ will not drop it at any stage since (1) is satisfied.

4.2. The decision to File Suit

We already saw that if (1) is violated then $\mathcal{P}$ will not file a law suit against $\mathcal{D}$.

Suppose next that (1) holds. Then it is necessary to consider two further possibilities. The first is that (3) is violated and hence if a suit is filed it will be tried in Court, while the second is that (3) holds and hence if a suit is filed it will be settled out of Court.

Clearly if if (1) holds and (3) is violated then (1) itself is the only relevant condition. Hence in this case $\mathcal{P}$ will file suit if and only if (1) holds, and the case will be litigated in Court.

[15] More details are provided in the Appendix (see Remark A.3).

[16] In the same spirit of what we assumed about filing suit and going to Court (see Footnote 14 above), we assume that when either party is indifferent between paying and not paying the pretrial negotiating cost, then they will choose to pay it. As before, this is completely inessential.

If (1) holds and (3) holds then $\mathcal{P}$ will file suit if and only if

$$\mathcal{I} - c_T^{\mathcal{P}} + \beta c_T - c_A^{\mathcal{P}} > 0 \tag{4}$$

in which case the suit will be settled out of Court.[17]

Hence, in our complete information model a suit may be filed for two distinct reasons. Because $\mathcal{P}$ expects that it will be settled out of Court, or because $\mathcal{P}$ expects that it will, in fact, go to trial. Thus, the decision to file suit is the result of both the direct comparison of Court costs and expected damages $\mathcal{I}$, and of the conditions that determine whether the suit will go to trial or be settled out of Court.

4.3. Main Characterization

Putting together our findings of Subsections 4.1 and 4.2 above we have a full characterization of the equilibria of our model. We state the following result without any further proof since it is obtained simply collecting our findings so far.

Proposition 1. *Main Characterization: As the parameters vary, three equilibrium outcomes are possible in our model.*

N - *The Plaintiff $\mathcal{P}$ does not file a suit against $\mathcal{D}$ and the game terminates immediately.*

C - *The Plaintiff $\mathcal{P}$ files a suit against $\mathcal{D}$ and the case is litigated in Court.*

S - *The Plaintiff $\mathcal{P}$ files a suit against $\mathcal{D}$ and the case is settled out of Court.*

Case **N** *obtains if either* (i) *(1) does not hold, or* (ii) *(1) holds, (3) holds and (4) is violated. Case* **C** *obtains if (1) holds, (3) is violated. Case* **S** *obtains if (1) holds, (3) holds and (4) holds.*[18]

5. Trial Costs and Fee-Shifting Rules

The trial costs $c_T^{\mathcal{P}}$ and $c_T^{\mathcal{D}}$ play a critical role in our model. Together with the expected damages $\mathcal{I}$ they determine the disagreement point of the bargaining problem that identifies the settlement $\mathcal{S}$. As we saw above, they also motivate the parties to reach a pretrial agreement via Assumption 1.

[17] More details are provided in the Appendix (see Remark A.4).

[18] Notice that the conditions we have listed are exhaustive of all combinations of (1), (3) and (4) holding or being violated. Hence the statement of Proposition 1 is exhaustive of all possibilities.

Below we consider four main rules for allocating such trial costs. These are well known in the legal literature (Katz and Sanchirico, 2012) and of course many nuanced versions and hybrids of these four basic rules can be constructed and are in fact observed in different legal systems around the world.

We introduce new notation to denote the "raw" trial costs (mainly attorney fees, but other Court costs too where appropriate) that "naturally burden" $\mathcal{P}$ and $\mathcal{D}$ — let these be $\hat{c}_T^{\mathcal{P}}$ and $\hat{c}_T^{\mathcal{D}}$ respectively, and note that necessarily $c_T = \hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}$. Therefore under a rule (in fact one of the four we will explicitly consider below) that stipulates that "each party pays their own trial costs" the trial costs we have used so far would be $c_T^{\mathcal{P}} = \hat{c}_T^{\mathcal{P}}$ and $c_T^{\mathcal{D}} = \hat{c}_T^{\mathcal{D}}$. Under a putative rule that stipulates that "the plaintiff always pays all trial costs" then we would have $c_T^{\mathcal{P}} = \hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}$ and $c_T^{\mathcal{D}} = 0$, and so on.

In general, a fee-shifting rule $\mathbf{\Phi}$ is a map that takes as inputs the raw costs $\hat{c}_T^{\mathcal{P}}$ and $\hat{c}_T^{\mathcal{D}}$ and returns a pair of actual trial costs to be paid by each side with the obvious restriction that all costs must be paid by one side or the other so that $\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}} = c_T^{\mathcal{P}} + c_T^{\mathcal{D}} = c_T$.[19]

As mentioned above the four polar cases for $\mathbf{\Phi}$ that we will consider are the so called *English Rule*, the so called *American Rule*, and two further cases that we will refer to as the *Plaintiff Biased* and the *Defendant Biased* rules.[20] As will be clear in Section 6.4 below, our results on the irrelevance of "fee shifting" apply to all possible arrangements not just to these four canonical cases.

Under the *American Rule*, denoted $\mathbf{\Phi}^{US}$, each side pays their own costs regardless of the Court decision. In this case, we have $c_T^{\mathcal{P}} = \hat{c}_T^{\mathcal{P}}$ and $c_T^{\mathcal{D}} = \hat{c}_T^{\mathcal{D}}$ and, using (2), the settlement is[21]

$$\mathcal{S}(\mathbf{\Phi}^{US}) \;=\; \mathcal{I} \;+\; \beta\,\hat{c}_T^{\mathcal{D}} \;-\; (1-\beta)\,\hat{c}_T^{\mathcal{P}} \tag{5}$$

Under the *English Rule*, denoted $\mathbf{\Phi}^{UK}$, the loser pays the costs of both sides. In this case, we have that $c_T^{\mathcal{P}} = (1-p)(\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}) = (1-p)c_T$ and $c_T^{\mathcal{D}} = p(\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}) = pc_T$ and, using (2),

[19]We also take all four costs $\hat{c}_T^{\mathcal{P}}$, $\hat{c}_T^{\mathcal{D}}$, $c_T^{\mathcal{P}}$ and $c_T^{\mathcal{D}}$ to be non-negative.

[20]The dominant terminology to distinguish between what we refer to as Plaintiff and Defendant Biased is "one-way fee-shifting" between the two parties. We use the short hand above since it seems efficient in our context.

[21]In calculating the settlement $\mathcal{S}$ for any given rule we assume that (1) holds and hence that $\mathcal{S}$ is given by (2). This is because as we saw in Proposition 1 if (1) is violated then $\mathcal{P}$ does not file against $\mathcal{D}$ and the game terminates immediately.

the settlement is

$$\mathcal{S}(\mathbf{\Phi}^{UK}) \;=\; \mathcal{I} \;+\; \beta\, p\, c_T \;-\; (1-\beta)\,(1-p)\,c_T \tag{6}$$

Under the *Plaintiff Biased Rule*, denoted $\mathbf{\Phi}^P$, the Plaintiff pays $\hat{c}_T^{\mathcal{P}}$ if he loses, and pays nothing otherwise. In this case, we have $c_T^{\mathcal{P}} = (1-p)\hat{c}_T^{\mathcal{P}}$ and $c_T^{\mathcal{D}} = p\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}$ and, using (2), the settlement is

$$\mathcal{S}(\mathbf{\Phi}^{P}) \;=\; \mathcal{I} \;+\; \beta\,(p\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}) \;-\; (1-\beta)(1-p)\,\hat{c}_T^{\mathcal{P}} \tag{7}$$

Under the *Defendant Biased Rule*, denoted $\mathbf{\Phi}^D$, the Defendant pays $\hat{c}_T^{\mathcal{D}}$ if he loses, and pays nothing otherwise. In this case, we have $c_T^{\mathcal{P}} = \hat{c}_T^{\mathcal{P}} + (1-p)\hat{c}_T^{\mathcal{D}}$ and $c_T^{\mathcal{D}} = p\hat{c}_T^{\mathcal{D}}$ and, using (2), the settlement is

$$\mathcal{S}(\mathbf{\Phi}^{D}) \;=\; \mathcal{I} \;+\; \beta\, p\hat{c}_T^{\mathcal{D}} \;-\; (1-\beta)\,[\hat{c}_T^{\mathcal{P}} + (1-p)\hat{c}_T^{\mathcal{D}}] \tag{8}$$

6. Implications

In this Section we examine more closely the implications of Proposition 1 as the raw parameters and the fee-shifting rule change. We seek a set of statements of the type "as this change occurs in the raw parameters or in the fee-shifting rule (or both), this outcome becomes more or less likely, or remains equally likely."

It should be noted that the word "likely" in these statements has a specific meaning that, while common, does not directly map into standard probabilities. If we say that a particular equilibrium outcome $\mathbf{X} \in \{\mathbf{N}, \mathbf{C}, \mathbf{S}\}$ becomes more (less) likely as a result of a certain parameter(s) (say) increasing we will mean that the set of (other) raw parameters under which the outcome $\mathbf{X}$ obtains before the change is a subset (superset) of the one that yields outcome $\mathbf{X}$ after the change. If the set is the same before and after the change we will say that the likelihood of $\mathbf{X}$ has not changed.[22]

[22]Notice that this way of proceeding is consistent with placing a prior distribution with full support on the set of possible parameters and then drawing a configuration of parameters (a particular "case") at random, all while remaining agnostic about the precise distribution governing the draw.

6.1. Filing Suit

What are the implications of Proposition 1 for the amount of legal disputes in society as measured by the frequency of law suits that are filed. How does the likelihood of outcomes **C** or **S** change as the raw costs and the fee-shifting rule $\mathbf{\Phi}$ vary?

For the sake of clarity we divide our claims into those that concern the effects of a change in the parameters, and those that concern the effects of the fee-shifting rule $\mathbf{\Phi}$ for given raw costs.

All our assertions in this Section are stated without proof since they are a direct consequence of Proposition 1 and of the relevant inequalities (1), (3) and (4).[23]

Proposition 2. *Legal Disputes and Expected Damages: Legal disputes become more likely as the size of expected damages $\mathcal{I}$ increases. This is so both for law suits that are initiated with a view to end up in Court (outcome* **C***) and those which are initiated with a view to settle out of Court (outcome* **S***).*

While Proposition 2 is straightforward, it is worth noticing that the effect of an increase in $\mathcal{I}$ on the likelihood of law suits that are initiated with a view to settle out of Court (outcome **S**) is due to the effect of the increase in $\mathcal{I}$ on the settlement size $\mathcal{S}$ via (2).

Proposition 3. *Legal Disputes, Trial and Pretrial Costs and Bargaining Power: Legal disputes become less likely as the Plaintiff's trial costs $c_T^{\mathcal{P}}$ increase, and as the Plaintiff's pretrial costs $c_A^{\mathcal{P}}$ increase. Legal disputes become more likely as the Defendant's trial costs $c_T^{\mathcal{D}}$ increase. Finally, legal disputes become more likely as the Plaintiff's bargaining power β increases.*

Proposition 3 is again straightforward. It should be clarified that while in Proposition 2 we could be explicit about both types of law suits (both outcome **C** and outcome **S**) this is no longer possible for the parameter changes hypothesized in Proposition 3.[24] This is because the terms $c_T^{\mathcal{P}}$, $c_A^{\mathcal{P}}$, $c_T^{\mathcal{D}}$ and β also appear in (3) and the hypothesized changes could determine a switch from a case being settled out of Court to actually being litigated.[25]

[23] Notice that (4) can be re-written as $\mathcal{I} - (1-\beta)c_T^{\mathcal{P}} + \beta c_T^{\mathcal{D}} - c_A^{\mathcal{P}} - c_A^{\mathcal{P}} > 0$.

[24] The claims in Proposition 3 refer to the shrinkage or expansion of the *union* of the sets of parameters giving rise to outcomes **C** and **S**.

[25] Notice that (3) can be re-written as $\beta\,(c_T^{\mathcal{P}} + c_T^{\mathcal{D}}) = \beta c_T \geq c_A^{\mathcal{P}}$ and $(1-\beta)\,(c_T^{\mathcal{P}} + c_T^{\mathcal{D}}) = (1-\beta)c_T \geq c_A^{\mathcal{D}}$.

A change in the fee-shifting rule leaves $c_T = c_T^{\mathcal{P}} + c_T^{\mathcal{D}}$ unchanged, and hence does not affect (3).[26] It follows that we can be specific, once again, about outcome **C** and outcome **S** in the case of a change in $\mathbf{\Phi}$.

Proposition 4. *Legal Disputes and Fee-Shifting Rules: Let a set of raw costs be given and consider a change in the fee-shifting rule from say $\mathbf{\Phi}'$ to $\mathbf{\Phi}''$. Suppose that under $\mathbf{\Phi}''$ we have that $c_T^{\mathcal{P}}$ is lower than under $\mathbf{\Phi}'$. Then the change from $\mathbf{\Phi}'$ to $\mathbf{\Phi}''$ increases the likelihood of legal disputes. This is so both for law suits that are initiated with a view to proceed to Court litigation (outcome* **C***) and those which are initiated with a view to settle out of Court (outcome* **S***).*

Going back to the four polar cases we introduced in Section 5, using (5), (6), (7) and (8), we easily see the following two corollaries of Proposition 4.

Corollary 1. *Legal Disputes, Plaintiff Biased, American and Defendant Biased Rules: The likelihood of legal disputes of both types (outcome* **C** *and outcome* **S***) decreases as we switch from a Plantiff Biased Rule $\mathbf{\Phi}^P$ to the American Rule $\mathbf{\Phi}^{US}$ or to the Defendant Biased Rule $\mathbf{\Phi}^D$.*

A direct comparison of the *English Rule* $\mathbf{\Phi}^{UK}$ and the *American Rule* $\mathbf{\Phi}^{US}$ is more nuanced.

Corollary 2. *Legal Disputes, American and English Rules: Recall that $c_T^{\mathcal{P}}$ is equal to $\hat{c}_T^{\mathcal{P}}$ under the American Rule and equal to $(1-p)(\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}})$ under the English Rule. Legal disputes of both types (outcome* **C** *and outcome* **S***) are more likely under $\mathbf{\Phi}^{UK}$ than they are under $\mathbf{\Phi}^{US}$ if $\hat{c}_T^{\mathcal{P}} > (1-p)(\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}) = (1-p)c_T$.*

If we hypothesize (Shavell, 1982) that small trial costs c_T are typically a sign of small claims, we conclude that the *English Rule* works to encourage lawsuits by Plaintiffs with relatively small claims but relatively high probabilities of victory p. Conversely, the *American Rule*, since the litigation costs do not depend on p, encourages Plaintiffs with possibly lower p. This brings our comparison of $\mathbf{\Phi}^{UK}$ and $\mathbf{\Phi}^{US}$ in line with that of Shavell (1982).

We conclude noting that an ingredient that is potentially important but is absent from our set-up is that when law suits are discouraged by Plaintiffs' costs this may have an adverse effect on the potential Defendants' incentives to comply with the law in the first place (Shavell, 1982).

[26]This observation will be key to our analysis in Subsection 6.4 below.

6.2. *Going to Trial vs Settling and Mis-Matched Bargaining Power*

One of the main findings of this paper is that even in a world of complete and perfect information there are circumstances in which rational parties to a legal dispute will litigate in Court even though this is costly and hence wasteful. Going to Court (Assumption 1) is more expensive than settling out of Court.

As we pointed out above, going to Court is a failure of the Coase Theorem (Coase, 1960). There we also mentioned that this failure is generated by a mis-match between the distribution of the parties' bargaining power and the distribution of the *ex-ante* costs that must be paid for the pretrial negotiation to become feasible. This mis-match creates a version of the hold-up problem. This prevents one of the parties from paying their ex-ante cost and hence leaves Court litigation as the only way to end the legal dispute.

In this Subsection, using Proposition 1, we substantiate in detail our claim that going to Court is generated by the mis-match we have described.

From Proposition 1 we know that $\mathcal{P}$ will file against $\mathcal{D}$ and the dispute will be litigated in Court if and only if (3) is violated and (1) holds. Purely for the sake of convenience we restate the former conditions here.[27]

$$\beta\,(c_T^{\mathcal{P}} + c_T^{\mathcal{D}}) = \beta\, c_T \geq c_A^{\mathcal{P}} \qquad \text{and} \qquad (1-\beta)\,(c_T^{\mathcal{P}} + c_T^{\mathcal{D}}) = (1-\beta)\, c_T \geq c_A^{\mathcal{D}} \tag{3}$$

If the first inequality in (3) is violated, then $\mathcal{P}$ will find it profitable to deviate unilaterally from paying the *ex-ante* cost $c_A^{\mathcal{P}}$ that makes the pretrial agreement negotiation possible. If the second inequality in (3) is violated, then $\mathcal{D}$ will find it profitable to deviate unilaterally from paying the *ex-ante* cost $c_A^{\mathcal{D}}$ that makes the pretrial agreement negotiation possible.

Notice that, because of Assumption 1, the two inequalities in (3) cannot be both violated. However, it is also clear that for any fixed quadruple of costs $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ satisfying Assumption 1 there exists values of $\beta \in (0,1)$ such that (3) is violated. Indeed, by simple inspection it is clear that, for any given $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ satisfying Assumption 1, we can find a (low) range of values of $\beta \in (0,1)$ such that the first inequality in (3) is violated. Alternatively we can find a (high) range of values of $\beta \in (0,1)$ such that the second inequality in (3) is violated. Similarly, if we fix a value of $\beta \in (0,1)$, it is always possible to find a quadruple

[27] See Footnote 25.

of costs $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ satisfying Assumption 1 such that (3) is violated.[28] Since (1) can be satisfied for any quadruple of costs $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ by taking $\mathcal{I}$ to be sufficiently large, we can state the following without further proof.

Proposition 5. *Court Trials and the Mis-Match of β and Ex-Ante Costs: Suppose that (1) is satisfied. The parties will not sign a pretrial agreement and hence go to trial whenever either one of the inequalities in (3) is violated.*

It follows that, for any fixed quadruple of costs $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ satisfying Assumption 1, there exists values of $\beta \in (0,1)$ such that a pretrial agreement will not be signed, and the parties will go to trial.

Finally, for any given value of $\beta \in (0,1)$, there exist a vector of costs $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ satisfying Assumption 1 such that a pretrial agreement will not be signed, and the parties will go to trial.

By the time plaintiff and defendant reach the negotiation table of the pretrial agreement they already have paid (sunk) the costs needed to prepare for such a negotiation. Therefore such costs are effectively off the table: neither party has any incentive to compensate the other party for paying these *ex-ante* costs since by that time the costs have already been paid. It is then possible to envisage a whole range of situations in which one of the two parties will be able to guarantee himself a share of the surplus that is on the pretrial negotiation table that does not cover the preliminary costs he needs to pay to participate in such negotiation. This may be due either to the fact that such party does not have enough bargaining power in the pretrial negotiation or to the fact that his *ex-ante* costs are two high. In both cases the result is that the parties will not settle out of Court and the trial will take place.

If the parties can shift some of the *ex-ante* costs to a later stage, after the pretrial negotiation, such a negotiation will take these *ex-post* costs into account when deciding the settlement and hence the likelihood of a settlement will increase. However, it seems uncontroversial that at least *some* of these costs cannot be reasonably shifted to a later stage. This is clearly true in the case of cognitive or opportunity costs associated with the time necessary to prepare for the settlement negotiation. Clearly some of these costs can be monetized by hiring an expert or a lawyer but, provided the costs need to be paid independently of the

[28] Again, by simple inspection, for any $\beta \in (0,1)$ we can find a quadruple of costs $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{P}, c_T^{\mathcal{D}})$ satisfying Assumption 1 such that the first inequality in (3) is violated, as well as one that ensures that the second inequality is violated.

outcome, the result is unchanged. If anything agency problems might lead to an increase of the *ex-ante* costs and hence in the likelihood of going to trial.

It is legitimate at this point to ask what would happen if the pre-trial agreement ex-ante costs are "productive" as in Hubbard (2015). In particular, there the parties can choose to sink part of the trial costs at an ex-ante stage. In this sense the ex-ante costs are productive as they carry a (one-for-one) reduction in trial costs. In our model one could imagine transforming some or all of the trial costs into pre-trial agreement ex-ante costs. These are "preparation costs" (eg evidence-collection) that help both during a pre-trial negotiation and at the trial stage.

Reducing trial costs and correspondingly increasing the pre-trial agreement costs in our model has a two-fold effect.[29] It will increase the likelihood that a suit is filed, and it will increase the likelihood that a suit goes to trial as opposed to being settled out of Court. While the "sign" of these effects is intuitive in both cases since trials are less expensive, it is worth remarking that the greater likelihood of trial vs settlement has two sources. The inequalities in (3) are harder to satisfy *both* because the trial costs go down and because the pre-trial negotiation ex-ante costs increase. Trials are cheaper and the negotiations that lead to pre-trial agreements are harder to reach.

6.3. Class Actions

While systematic evidence of the effect of the mis-match between bargaining powers and pre-trial agreement costs may be difficult to compile, the available evidence on class actions in the United Sates in our view is extremely suggestive in support of the qualitative behavior of our model.

When a class action is certified the bargaining power of the plaintiffs is greatly enhanced against what is usually a powerful firm that would otherwise easily overwhelm individual plaintiffs. After this takes place, the judicial paths "invariably lead to class settlements" (Willging and Lee III, 2010, p. 782).[30] Just as our model predicts, the implicit shift in bargaining power leads to a (considerable in this case) increase in the likelihood that the case will be settled before a full trial takes place.

In the US, certification of a class action in accordance with Fed. R. Civ. P. 23 of course

[29] Our claims here are immediate from Proposition 1, and we omit further details.
[30] See also Morabito and Caruana (2013) and Grimaldi (2017).

significantly increases the settlement costs for the Plaintiff side.[31] It should, however, be noted that our model allows for the change in bargaining power in favor of the Plaintiff to overwhelm the increase in settlement costs so as to generate what is observed in practice — namely that class action are almost invariably settled out of court. To make this point more explicit it is useful to go back to our numerical example of Section 2. There, an increase in bargaining power for $\mathcal{P}$ from $\beta = 1/10$ to $\beta = 1/2$, resulted in a case that is tried (when $\beta = 1/10$) to a case that is settled out of Court (when $\beta = 1/2$). A quick re-examination of the numerical values, shows that if we increase β to 1/2 and at the *same time* we increase $c_A^{\mathcal{P}}$ from 10 to 19, we still obtain a case that is settled out of Court.[32]

To close our consideration of class actions, we notice that there is a copious literature (see for instance Fitzpatrick (2010) and the references therein) on the fact that the actual class members reap scant rewards from class action suits, while their lawyers take the lion's share of the proceeds. This is not our focus here as it pertains to an analysis of the relative bargaining powers of class members and and their legal representatives. A richer model of this interaction is needed to shed more light on this issue. What matters for our purposes is that the bargaining power of the entire plaintiff side (class members and their lawyers) is enhanced by the class action certification.

6.4. *Changes In Fee-Shifting Rules and Likelihood of Trial*

As we have seen in Proposition 4, for given raw parameters, a change in the fee-shifting rule $\mathbf{\Phi}$ determines a change in the likelihood of legal disputes. Essentially any change in $\mathbf{\Phi}$ that decreases the plaintiff's Court costs increases the likelihood of legal disputes — both those that are settled before trial (outcome **S**) and those that are tried in Court (outcome **C**).

On the other hand, as we have noted before, a change in the fee-shifting rule leaves $c_T = c_T^{\mathcal{P}} + c_T^{\mathcal{D}} = \hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}$ unchanged, and hence does not affect (3).

The latter observation suggests that there should be a sense in which fee-shifting is irrelevant in determining whether a given law suit will be settled out of Court or in fact litigated in Court. This is in fact true in our set up, provided we are careful enough in making the claim precise and taking into account that we are making it for a *given law suit*. In other

[31] See Judiciary Committee of the House of Representatives (2014), page 28.

[32] With the numbers in Section 2, when $\beta = 1/2$ and $c_A^{\mathcal{P}} = 10$, the payoff to $\mathcal{P}$ from settling out of Court is 90, while if he defects and forces a trial he obtains a payoff of 80. When $\beta = 1/2$ and $c_A^{\mathcal{P}} = 19$ the payoff to $\mathcal{P}$ from settling out of Court is 81, while if he defects and forces a trial he obtains a payoff of 80.

words, we need to filter out of the irrelevance claim the effect that a change in fee-shifting rule may have in the Plaintiff's decision to file a suit or not.

To ease the exposition, and keep notation down we proceed with an informal statement that is made precise in the appendix (see Section A.6 and in particular Proposition A.1, which is a formal re-statement of Proposition 6 below)

Proposition 6. *Irrelevance of Fee-Shifting: Conditionally on the parameters of the model being such that $\mathcal{P}$ wants to file a suits against $\mathcal{D}$, a change in the fee-shifting rule cannot possibly determine a switch of any given "case" from being settled out of Court to being tried in Court, or vice-versa.*

In our complete information set up, conditionally on $\mathcal{P}$ filing against $\mathcal{D}$, fee-shifting is irrelevant. Conditionally on the Plaintiff filing a suit, the likelihood of going to trial is the same however the trial costs are apportioned between $\mathcal{P}$ and $\mathcal{D}$.

As we noted above Proposition 6 is driven by (3) that identifies under which condition either party will pay the *ex-ante* costs and a settlement will be reached out of Court. Indeed, condition (3) implies that while the likelihood of ending up in Court does depend on the distribution of the parties bargaining power in the settlement negotiation, β, as well as on the distribution of their *ex-ante* costs $c_A^{\mathcal{P}}$ and $c_A^{\mathcal{D}}$, this likelihood only depends on the total amount of trial costs c_T and hence is independent of the distribution of such costs.

By the time a pretrial negotiation is reached the *ex-ante* costs $c_A^{\mathcal{P}}, c_A^{\mathcal{D}}$ are *sunk*. Therefore the outcome of the negotiation does not depend on these costs. The negotiation of a pretrial agreement simply divides the surplus generated by avoiding a costly trial[33] — namely c_T — between $\mathcal{P}$ and $\mathcal{D}$ according to their respective bargaining powers β and $1 - \beta$. The two conditions in (3) require that, out of the bargaining, both $\mathcal{P}$ and $\mathcal{D}$ receive a share of the surplus that covers their *ex-ante* costs $c_A^{\mathcal{P}}$ and $c_A^{\mathcal{D}}$.

This is a natural point to remark that our results imply that if Courts were to try to affect the decision to settle vs going to trial by adopting a fee-shifting rule that somehow takes the pre-trial negotiation ex-ante costs into account they would not succeed. For instance, say that the Plaintiff, as a rule, was forced to pay back the Defendant's pre-trial agreement ex-ante costs $c_A^{\mathcal{D}}$, clearly, in this case the total trial cost c_T is unchanged since this is a pure transfer

[33] See Assumption 1.

from $\mathcal{P}$ to $\mathcal{D}$. Hence, as with any other fee-shifting rule, while the likelihood of filing suit changes, conditional on a suit being filed the likelihood of a settlement vs a trial is unchanged.

Going back to the four polar cases laid out in Section 5, Proposition 6 obviously implies the following.

Corollary 3. *Equivalence of US, UK, P and D: Any switch between the US, UK, P and D fee-shifting rules defined in Section 5 above is irrelevant in the sense of Proposition 6 above.*

Conditionally on the the Plaintiff filing a suit regardless of the switch, the likelihood of going to trial or settling out of Court is unaffected by the change in fee-shifting rule.

Notice that while in the pretrial negotiation literature the irrelevance of fee-shifting rules is associated with some version of the Coase Theorem (Donohue, 1991b), in our setting the irrelevance of fee-shifting holds exactly when the Coase Theorem fails — in our set up the parties go to Court when the Coase theorem fails because of the presence of *ex-ante* costs. As we mentioned above, one could of course ask the question whether an advanced agreement between the parties on how to distribute their *ex-ante* costs may prevent them from going to trial. The answer is that if this preliminary negotiation is itself associated with some *ex-ante* costs there will still exist circumstances in which the parties will end up in Court.[34]

We conclude this section by returning to the fact that our fee-shifting irelevance result is conditional on suits being filed. In reality we only observe suits which have been filed and conditional on those suits being filed we can distinguish if those suits end up in trial or in settlement. Therefore, in principle our result on the irrelevance of fee-shifting could and has been tested. However, the evidence is sparse and our reading of the literature is that the extant empirical studies do not reach consesus on the effects of fee-shifting on the probability of settlement out of Court. We refer the reader to Katz and Sanchirico (2012) for a survey.

6.5. Relevance of Fee Shifting for Settlement Size

Except for its possible effect on $\mathcal{P}$ filing against $\mathcal{D}$, the fee-shifting rule is irrelevant in determining whether the equilibrium outcome is **C** or **S**. It follows that it *must* be relevant for settlement size.

[34] In the context of a bargaining model where ex-ante costs are associated with bargaining parties' decision to participate in the negotiation and hence Coase Theorem fails Anderlini and Felli (2006) shows that adding a preliminary stage where parties negotiate on whether future bargaining cost will be paid does not necessary restore the Coase Theorem. As in pre-trial settlement context the key to this result is the fact that the preliminary negotiation stage may itself be associated with ex-ante costs.

To see this, consider for instance a "case" $\hat{\mathbf{\Omega}}$ and fee-shifting rule that induce an outcome of $\mathbf{S}$. Suppose for concreteness that the fee-shifting rule is $\mathbf{\Phi}^{\mathcal{D}}$, the Defendant biased rule. Proposition 6 tells us that the outcome will still be $\mathbf{S}$ if we change the fee-shifting rule to be $\mathbf{\Phi}^{\mathcal{P}}$, the Plaintiff biased rule.

Under $\mathbf{\Phi}^{\mathcal{D}}$ the defendant's Court costs $c_T^{\mathcal{D}}$ are considerably lower than under $\mathbf{\Phi}^{\mathcal{P}}$.[35] However, since the equilibrium outcome is $\mathbf{S}$ under both fee-shifting rules, it must be that $\mathcal{D}$ prefers to pay the *ex-ante* cost and settle to actually going to Court before and after the increase in $c_T^{\mathcal{D}}$. It therefore *must* be the case that the change in fee-shifting rule implies a compensating change in settlement size.

The logic of the above example generalizes. The following is a direct consequence of (5), (6), (7) and (8) and hence it is stated without proof.

Proposition 7. *Settlement Size: The settlement size is always greater under the Plaintiff Biased Rule than under the Defendant Biased Rule, for any set of raw parameters of the model. In other words,*

$$\mathcal{S}(\mathbf{\Phi}^{P}) > \mathcal{S}(\mathbf{\Phi}^{D})$$

for any given $\hat{\mathbf{\Omega}}$.

The comparison between the size of the settlement under the English and American Rules instead depends on (some of) the elements of $\hat{\mathbf{\Omega}}$. *In particular*

$$\mathcal{S}(\mathbf{\Phi}^{UK}) - \mathcal{S}(\mathbf{\Phi}^{US}) = p\,\hat{c}_T^{\mathcal{P}} - (1-p)\hat{c}_T^{\mathcal{D}}$$

Hence if either p is sufficiently large, or $\hat{c}_T^{\mathcal{D}}$ is sufficiently small (or both) then the settlement size under the English Rule is larger than the settlement size under the American Rule.

The empirical effects of moving from the American rule to the English rule have been analyzed by the existing literature on fee-shifting (Katz and Sanchirico, 2012). In particular, the evidence presented in Hughes and Snyder (1995) suggests that the size of the settlement is significantly higher under the English rule than under the American rule. The key issue is that there exist very few natural experiments in which the legal system moved from one fee-shifting rule to another. An exception is represented by Florida's experiment with the English rule in medical malpractice cases in the 1980s.[36] Consistently with the predictions

[35] As we noted in Section 5 they are $c_T^{\mathcal{D}} = p\,\hat{c}_T^{\mathcal{D}}$ under $\mathbf{\Phi}^{\mathcal{D}}$ and $c_T^{\mathcal{D}} = p\,\hat{c}_T^{\mathcal{P}} + \hat{c}_T^{\mathcal{D}}$ under $\mathbf{\Phi}^{\mathcal{P}}$.

[36] See Snyder and Hughes (1990) for a description of the Florida experiment and the associated data set.

of our analysis above Hughes and Snyder (1995) find, using data on this experiment, that the difference in settlement size is positively correlated with the probability of the plaintiff winning in Court and negatively correlated with the defendant's "raw" trial costs.

7. Asymmetric Information

Our model postulates *complete* and *symmetric* information. Since most of the literature related to this paper uses models with asymmetric information (see Subsection 1.1 for references and an overview of these contributions), before concluding we think it is appropriate to sum up where our conclusions stand relative to these models.

Our conclusions go against the received wisdom that going to trial is only the result of informational asymmetries. This is not so in our set-up in which it is a failure of the Coase theorem that takes the parties to an inefficient trial. Of course our results do not say that informational frictions cannot be responsible for on-path trials, but simply that these are not necessary for these to materialize. While we do not "overturn" any existing results, we add a robust rationale for inefficient trials to take place.

In a somewhat similar vein, our results indicate that the effect of fee-shifting is intimately related to informational frictions. In our set-up a shift in the way legal costs are apportioned is completely neutralized by the resulting change in the settlement that emerges from the Nash bargaining that the parties engage in, which anticipates the change in fees. Asymmetric information changes the picture dramatically. For instance in Spier (1994a) a fee shift can create powerful incentives to settle or go to trial. The choice of how legal fees are apportioned can be thought as a problem of "mechanism design."[37]

In Spier (1992), and more recently in Daughety and Reinganum (2011), informational asymmetries interplay with the dynamics of the model. Therefore, the issues they address differ quite substatially from the ones we address in our static model with complete and symmetric information. In Spier (1992) a "deadline effect" yields a U-shaped pattern of pre-trial settlements — these are more likely to begin with, and then again as the trial date approaches. Daughety and Reinganum (2011) instead focus on the "bandwagon effect" that can arise when new plaintiffs can decide to join an existing suit.

[37]Spier (1994a) solves a mechanism design problem in which the probability of settlement out of Court is maximized. She then argues that the resulting mechanism resembles Fed. R. Civ. P. 68 of (See Judiciary Committee of the House of Representatives (2014), page 85.)

To conclude we mention Schmitz (2016) studies a model that is a version of Anderlini and Felli (2006) with incomplete information about surplus-size. He finds that in some cases incomplete information in the presence of transaction costs might indeed facilitate an agreement between the parties. His analysis would be a good starting point to incorporate *some* incomplete information in our set-up.

8. Conclusions

This paper identifies a reason why rational parties to a legal dispute may end up in Court in spite of full information and the opportunity to reach an efficient pretrial settlement. This reason is the existence of *ex-ante* costs associated with the pretrial negotiation, and in particular the mismatch between the distribution of these *ex-ante* costs and the parties' bargaining power in the pretrial negotiation.

The model yields two further insights. In a model with rational fully informed actors, some law suits will be filed even though it is fully anticipated that they will be settled out of Court. These are "in addition" to those law suits that will be litigated in Court.

Lastly, a change in fee-shifting rule may have an effect on whether a law suit is in fact filed or not. However, such change in fee-shifting rule has no effect on whether the suit is litigated in Court or settled beforehand.

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Appendix

A.1. The Determination of $\mathcal{S}$

Given the payoffs we have posited in Section 3, and contingently on the game in Figure 1 reaching the top rigth-most node, we can conclude that $\mathcal{S}$ will be determined by generalized Nash bargaining with disagreement payoffs for $\mathcal{P}$ and $\mathcal{D}$ given respectively by

$$d^{\mathcal{P}} = \mathcal{I} - c_A^{\mathcal{P}} - c_T^{\mathcal{P}} \qquad \text{and} \qquad d^{\mathcal{D}} = -\mathcal{I} - c_A^{\mathcal{D}} - c_T^{\mathcal{D}} \tag{A.1}$$

if (1) is satisfied. If instead (1) is violated the disagreement payoffs are

$$d^{\mathcal{P}} = -c_A^{\mathcal{P}} \qquad \text{and} \qquad d^{\mathcal{D}} = -c_A^{\mathcal{D}} \tag{A.2}$$

According to the generalized Nash bargaining solution, for given values of $d^{\mathcal{P}}$ and $d^{\mathcal{D}}$, the settlement amount will be chosen so as to solve

$$\mathcal{S} = \arg\max_{\mathcal{S}} \; \left[\mathcal{S} - c_A^{\mathcal{P}} - d^{\mathcal{P}}\right]^{\beta} \; \left[-\mathcal{S} - c_A^{\mathcal{D}} - d^{\mathcal{D}}\right]^{1-\beta} \tag{A.3}$$

Problem (A.3) is completely standard. Taking logs and differentiating, it is immediate to see that the first order conditions imply that

$$\mathcal{S} = (1-\beta)\left[c_A^{\mathcal{P}} + d^{\mathcal{P}}\right] - \beta\left[c_A^{\mathcal{D}} + d^{\mathcal{D}}\right] \tag{A.4}$$

Remark A.1: *Suppose that (1) is satisfied. We can then substitute (A.1) into (A.4) to obtain (2). If instead (1) is not satisfied, we can substitute (A.2) into (A.4) to obtain $\mathcal{S} = 0$, as required.*

A.2. Formal Definition of Equilibrium

We take the tree in Figure 1 as being substituted by one in which the top right-most node is replaced by payoffs for $\mathcal{P}$ and $\mathcal{D}$ being given by $\mathcal{S} - c_A^{\mathcal{P}}$ and $-\mathcal{S} - c_A^{\mathcal{D}}$ respectively, with $\mathcal{S}$ as in (2) if (1) is satisfied, and $\mathcal{S} = 0$ if (1) is violated. This is an extensive form game in the standard sense of the word for any given set of parameters.

Definition A.1: *The tree in Figure 1 – with the substitution mentioned above – yields an extensive form game of complete and perfect information that, in general, for any given set of parameters, admits a unique backwards induction solution.*

This is what we refer to as the (Subgame Perfect) equilibrium of our model (or "equilibria," as the parameters vary), and what we characterize and interpret throughout the paper.

A.3. Preliminary Remark

Remark A.2: *Suppose that (1) is violated. Then all payoffs to $\mathcal{P}$ aside from the one he obtains by terminating the game immediately are non-positive. Since we assume that in case of indifference $\mathcal{P}$ chooses not to sue $\mathcal{D}$, this confirms that if (1) is violated $\mathcal{P}$ will choose not to file against $\mathcal{D}$ and hence the game will terminate immediately.*

Notice that the claim in Remark A.2 is immediate by inspection of the payoffs in Figure 1, and by noticing that if (1) is violated then $\mathcal{S} = 0$.

A.4. The decision to Settle

Remark A.3: *If (1) is satisfied then provided $\mathcal{P}$ files the suit at $t = 0$ the parties pay their respective pre-trial costs and the suit is settled out of Court if and only if* [38]

$$\beta\, c_T \geq c_A^{\mathcal{P}} \qquad \text{and} \qquad (1-\beta)\, c_T \geq c_A^{\mathcal{D}} \tag{A.5}$$

Recall that since (1) is satisfied, $\mathcal{S}$ is as in (2). To see why the claim in Remark A.3 holds, we can then reason backwards as follows.

At $t = 2$, after $\mathcal{D}$ has paid $c_A^{\mathcal{D}}$, if $\mathcal{P}$ pays $c_A^{\mathcal{P}}$ and proceeds to the settlement bargaining stage he gets a payoff of $\mathcal{S} - c_A^{\mathcal{P}}$. If he does not pay $c_A^{\mathcal{P}}$ and choses not to drop the suit (which is clearly what he would do because (1) is satisfied), the suit will be adjudicated in Court and he will get a payoff of $\mathcal{I} - c_T^{\mathcal{P}}$.

Hence, he will pay $c_A^{\mathcal{P}}$ and the suit will be settled out of Court if and only if

$$\mathcal{S} - c_A^{\mathcal{P}} \;\geq\; \mathcal{I} - c_T^{\mathcal{P}} \qquad \Longleftrightarrow \qquad \beta\, c_T \;\geq\; c_A^{\mathcal{P}} \tag{A.6}$$

Now proceeding backward to $t = 1$, again since (1) is satisfied, if $\mathcal{D}$ does not pay $c_A^{\mathcal{D}}$, subsequently $\mathcal{P}$ does not drop the suit, and hence the case proceeds to trial in Court and $\mathcal{D}$ receives a payoff of $-\mathcal{I} - c_T^{\mathcal{D}}$.

[38] Recall that we assume that paying the pretrial negotiating cost is the choice when indifferent. See Footnote 16.

If instead $\mathcal{D}$ pays $c_A^{\mathcal{D}}$ then the game proceeds to $t = 2$ and as we have seen the suit is settled out of Court. Hence in this case $\mathcal{D}$ receives a payoff of $-\mathcal{S} - c_A^{\mathcal{D}}$. Hence, he will pay $c_A^{\mathcal{D}}$ and the play proceeds with the suit settled out of Court if and only if

$$-\mathcal{S} - c_A^{\mathcal{D}} \geq -\mathcal{I} - c_T^{\mathcal{D}} \qquad \Longleftrightarrow \qquad (1-\beta)\, c_T \geq c_A^{\mathcal{D}} \tag{A.7}$$

Putting together the right-hand sides of (A.6) and (A.7) yields the claim in Remark A.3.

A.5. The Decision to File

Remark A.4: *Suppose that (1) holds and that (3) is violated. Then $\mathcal{P}$ will file suit if and only if*

$$\mathcal{I} - c_T^{\mathcal{P}} > 0 \tag{A.8}$$

Suppose that (1) holds and that (3) holds. Then $\mathcal{P}$ will file suit if and only if

$$\mathcal{I} + \beta c_T^{\mathcal{D}} - (1-\beta) c_T^{\mathcal{P}} - c_A^{\mathcal{P}} = \mathcal{I} - c_T^{\mathcal{P}} + \beta c_T - c_A^{\mathcal{P}} > 0 \tag{A.9}$$

To see why the claim in Remark A.4 holds we can reason as follows.

Suppose that (1) holds and (3) is violated. Then if the suit is filed it will not be settled out of Court. Hence, using the payoffs in Figure 1, the payoff to $\mathcal{P}$ will be $\mathcal{I} - c_T^{\mathcal{P}}$. Hence $\mathcal{P}$ will file suit if and only if (A.8) holds.

Suppose that (1) holds and (3) holds. Then if a suit is filed it will be settled out of Court. It follows that $\mathcal{P}$'s payoff if he files is $\mathcal{S} - c_A^{\mathcal{P}}$, which, using (2), is equal to $\mathcal{I} + \beta c_T^{\mathcal{D}} - (1-\beta) c_T^{\mathcal{P}} - c_A^{\mathcal{P}}$. Hence if (1) and (3) hold, then $\mathcal{P}$ will file suit if and only if (A.9) holds.

A.6. Irrelevance of Fee-Shifting

Some extra notation is needed. Refer to an array of the type $\mathbf{\Omega} = (I, p, c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}}, \beta)$ as a set (or a configuration) of parameters of the model.[39] Clearly Proposition 1 fully characterizes under which configurations of parameters each of the **N**, **C** and **S** equilibrium outcomes will occur. When instead the "raw" trial costs $\hat{c}_T^{\mathcal{P}}$ and $\hat{c}_T^{\mathcal{D}}$ as in Section 5 are specified, we begin with a set of "raw parameters" $\hat{\mathbf{\Omega}} = (I, p, c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, \hat{c}_T^{\mathcal{P}}, \hat{c}_T^{\mathcal{D}}, \beta)$. As in Section 5, given a set of raw parameters and a fee-shifting rule $\mathbf{\Phi}$ we obtain a set of actual parameters $(I, p, c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}}, \beta)$. The latter, via Proposition 1 determines the equilibrium outcome of the model.

Suppose we have a given "case" $\hat{\mathbf{\Omega}}$ and consider a change in the fee-shifting rule from, say, $\mathbf{\Phi}'$ to $\mathbf{\Phi}''$. Let's call the resulting parameters after fee-shifting is taken into account $\mathbf{\Omega}' = \mathbf{\Phi}'(\hat{\mathbf{\Omega}})$ and $\mathbf{\Omega}'' = \mathbf{\Phi}''(\hat{\mathbf{\Omega}})$. Suppose also that we know that the change from $\mathbf{\Phi}'$ to $\mathbf{\Phi}''$ has no effect on whether $\mathcal{P}$ decides to file a suit against $\mathcal{D}$. In particular suppose that we know that $\mathcal{P}$ will file a law suit against $\mathcal{P}$ *both* under parameters

[39] Notice that all the cost terms are assumed to be positive, and β to be a number in $(0, 1)$. The quadruple $(c_A^{\mathcal{P}}, c_A^{\mathcal{D}}, c_T^{\mathcal{P}}, c_T^{\mathcal{D}})$ is further restricted by Assumption 1.

$\boldsymbol{\Omega}'$ and $\boldsymbol{\Omega}''$.[40] Then, since the switch from $\boldsymbol{\Omega}'$ to $\boldsymbol{\Omega}''$ leaves (3) unaffected, it must be that either the suit is settled out of Court or it is tried in Court with *both* parameters $\boldsymbol{\Omega}'$ and $\boldsymbol{\Omega}''$.

Building on our analysis so far, we can safely state the following result without further proof.

Proposition A.1*: A change in the fee-shifting rule cannot possibly determine a switch of any given "case" from being settled out of Court to being tried in Court, or vice-versa. In other words, let a set of raw parameters (a "case")* $\hat{\boldsymbol{\Omega}}$ *be given, and consider two possible fee-shifting rules* $\boldsymbol{\Phi}'$ *to* $\boldsymbol{\Phi}''$ *with corresponding parameters* $\boldsymbol{\Omega}' = \boldsymbol{\Phi}'(\hat{\boldsymbol{\Omega}})$ *and* $\boldsymbol{\Omega}'' = \boldsymbol{\Phi}''(\hat{\boldsymbol{\Omega}})$.

Assume that the equilibrium outcome associated with $\boldsymbol{\Omega}'$ *is either* **C** *or* **S**. *Assume that the equilibrium outcome associated with* $\boldsymbol{\Omega}''$ *is also either* **C** *or* **S**. *Then the equilibrium outcome associated with* $\boldsymbol{\Omega}'$ *and with* $\boldsymbol{\Omega}''$ *is the* same.

[40] The case in which $\mathcal{P}$ does not file against $\mathcal{D}$ is obviously not interesting here.