Negotiations, Expertise, and Strategic Misinformation

Danisz Okulicz*

Universidad Autònoma de Barcelona

September 13, 2018

Abstract

The paper analyzes the role of an expert in negotiations over settlements. I study a situation where a plaintiff suffers a harm of an unknown value from a defendant and contracts an attorney to provide an advise during the settlement negotiations. I show that in equilibrium the plaintiff never offers a contract that leads to a complete information transmission. If the costs of the trial are high, the plaintiff compromises on the precision of information and increases her bargaining position through transferring the costs of the trial to the attorney. If the costs of the trial are low, the plaintiff bears the costs herself. In this situation, the attorney recommends rejecting the settlement even for some offers that would be profitable for the plaintiff, which improves the plaintiff's bargaining position through making the threat of resolving the case by trial more credible. (JEL: D82,D83,D86,K41)

*Electronic address: d.okulicz@gmail.com

1 Introduction

When two parties negotiate, they rarely do it on their own, but often hire experts. Politicians hire diplomats to represent them during international summits; investors use the expertise of investment banks during an acquisition process; and companies rely on consultancy firms while buying highly specialized means of production. Yet the role of experts during the negotiations has received little attention in economic research.[1]

In this paper I analyze the strategic role of expertise during negotiations. The environment that I study is illustrated through an example of civil litigation and pre-trial negotiations – arguably the most common example of negotiations with expertise. The paper focuses on two main questions. How do pre-trial negotiations look like when plaintiffs have an access to a legal advise? Which incentives should the plaintiffs like induce on their lawyers?

To address the previous questions I build a theoretical model in which a plaintiff suffers a harm of unknown value from a defendant. To proceed with the litigation the plaintiff hires an attorney by signing a contract that specifies a division of the compensation and of the litigation costs. Once the contract is signed, the attorney devotes some time and learns the true liability value. To avoid the costly trial the plaintiff and the defendant negotiate a settlement. The negotiation is a signaling game – the defendant, who is also capable of evaluating the liability, makes a take-it-or-leave-it offer to the uninformed plaintiff. Upon receiving the offer, the plaintiff is also provided with an advise from her attorney.

The contract that the attorney and the plaintiff sign determines their incentives during the negotiation. Depending on how the incentives are set the negotiation follows one of four possible scenarios. If the incentives of the two agents are completely aligned, the attorney always conveys the true information about the liability value realization. In contrast, if the incentives of these agents are strongly misaligned no information between the plaintiff and the attorney is ever transmitted. In-between these extremes there exist two other possibilities. Firstly, the attorney may be less willing to resolve the case by trial than the plaintiff, but he can still provide imprecise but useful information. Secondly, the attorney can be the more aggressive agent. He may still provide relevant information, conditionally on whether settlement offer is sufficiently high.

I show that the plaintiff should never offer her attorney a contract that leads to a complete information transmission, that is, the optimal contract never aligns the incentives of the plaintiff and the attorney perfectly. The optimal contract can be of two types. First, if the cost of the trial for the plaintiff's side is relatively high compared to the expected value of the liability, like under minor tort law cases, the plaintiff compromises on the precision of the received information and increase her bargaining position by transferring the costs of the trial to her attorney. I refer to this scenario as *case selling*. In this situation the plaintiff follows her attorney recommendation only for a finite set of *standard offers*, and rejects any other offer. As a result, the defendant partitions the continuum of liability value, and for each element of the partition makes one standard offer.

When the cost of the trial are relatively insignificant for the plaintiff, like e.g., under medical malpractice cases, she decides to bear it herself. As a result an attorney recommends rejecting

[1]Fingelton and Raith (2005) is a notable exception. In their model the principal delegates negotiations to an expert who may be able to determine the reservation price of the other party. They find that not monitoring an expert ("closed-doors negotiations") is an optimal choice for the principal, since it gives fewer incentives for unskilled experts to pretend they are of a high skill.

some settlements that are profitable for the plaintiff. However, the plaintiff upon receiving a negative recommendation cannot distinguish the situation in which the attorney deceives her from the situation in which the offer indeed should be rejected. Hence, she can credibly resolve the case by the trial. Thus, in order to avoid the trial the defendant has to ensure positive recommendation of the attorney by making a higher offer. I refer to this scenario as *strategic misinformation*, since it closely resembles strategic delegation (proposed by Vickers, 1985 and studied in the environment of civil litigation by Hay, 1993 and Choi, 2003). The strategic delegation literature studies situations in which a principal delegates the decision-making process to an agent with different incentives in order to appear more aggressive and achieve a better equilibrium outcome.[2] Even though, in my model delegating the final decision is not allowed,[3] the plaintiff accepts low settlement offers only if the attorney recommends doing so, *de facto* which practically delegates the decision. However, strategic misinformation improves the plaintiff's position only if the liability value is sufficiently low. For other liability values, the offer that the plaintiff receives is so high that she has no credibility to reject it.

The idea that knowing less can be advantageous during the negotiation appears firstly in Thomas Schelling's *The Strategy of Conflict* (1960). It was formally developed in Kessler (1998) in an adverse selection environment. In order to maximize information rent, the agent finds it optimal to remain uninformed about his own type with some probability. My model takes a different approach to the problem of ignorance as a strategic tool. Through contracting with an expert, the plaintiff may ensure becoming informed only when the settlement offer is high compared to the liability value. Since the uninformed plaintiff can credibly resolve the case by trial, the defendant has an incentive to increase the settlement offer. Alternatively, the plaintiff may decide to compromise on the quality of the information she receives, but simultaneously improve her bargaining position through transferring the costs of the outside option to an expert, in a manner also proposed by Schelling (1960).

The paper relates to a literature on information design (Kamenica and Gentzkow 2011). However, in the environment that I study the attorney does not commit to the structure of messages he will send,[4] they are endogenously decided by the contract the plaintiff and the attorney sign. In contrast with Kamenica and Gentzkow (2011), at the moment of designing the information the interest of the plaintiff and the attorney are aligned – both agents want to sign a contract which yields profitable settlements. The incentives of the agents diverge only during the negotiation, as any particular offer profitable for one may be unacceptable for the other. The purpose of distorting the information in my model is influencing a behavior of the third party – the defendant. Similar problem has been previously analyzed by Roesler and Szentes (2017) who design an optimal learning scheme for consumers taking into account the influence of the consumers information on the pricing behavior of a monopolist.

The negotiation process in the model borrows from two classes of models. Firstly, the negotiation is a signaling game: the informed party (the defendant) makes the offer and the uninformed party (the plaintiff) may infer the state of the world from it. This setting is similar

[2] A canonical example is Cournot duopoly – the owner of one the firms can delegate the decision on setting the production level to a manager whose remuneration is based on the revenues rather than the profits. By doing so he credibly commits to increase of the production, changing the decision of his competitor and achieving higher profits (see Vickers, 1985).

[3] Following the regulation in Europe and US.

[4] The model in which commitment is allowed yields qualitatively similar results, although better settlements for the plaintiff are achievable.

to Reinganum and Wilde (1986).[5] However, I also introduce a third party, the informed attorney, who serves as an expert capable of providing additional information.

Secondly, I model expertise as a cheap-talk game (Crawford and Sobel 1982), i.e., I suppose that the informed expert can send a costless, unverifiable message to his client. The model differs from a standard cheap-talk setting in at least three points. Firstly, the incentives of the expert are endogenously decided (similarly to Krishna and Morgan, 2008). Secondly, the client has an additional source of information, since the settlement offer also carries a signal about the true state of the world.[6] Finally, the influence of an expert is not limited to the decision of the client. The defendant anticipates the advice of the attorney, and adjust its offer accordingly.

I focus on the role the attorney plays as an expert (following Dana and Spier 1993). For simplicity, I ignore the fact that the attorney while providing his services during the trial may be affected by moral hazard.[7]

The agency problem during the negotiations has been previously studied by Fingelton and Raith (2015). In their model the principal delegates negotiation to a career concerned expert who may be able to observe the reservation price of the other party. The principal may choose between monitoring an expert and "closed-doors negotiations" under which only the outcome of the negotiation is observed. It turns out that the latter option is an optimal choice for the principal, since it gives less incentives for the low skill experts to pretend they are of a high skill.

The paper is divided into six sections. In the second section I give an example of civil litigation. Third section describes the model and the solution concept. The fourth section is devoted to analyzing the possible outcomes of the negotiation. In section fife, I determine which contracts the plaintiff and the attorney should agree on. I conclude in section six.

2 Example of civil litigation

Before introducing the model it is worth analyzing a litigation process on an example. Consider a common case of a car accident.[8] A careful driver faced an accident due to a behavior of a careless driver. The car of the careful driver was damaged and requires a repair. The victim demands a compensation for the reparation costs from the careless driver's insurance company.

As a first benchmark, suppose that a plaintiff (the careful driver) is capable of evaluating the liability, and knows that she can obtain \$1000 in a court. However, bringing the case to a court is costly for both the plaintiff and a defendant (the insurance company), and each party incurs \$100 for going through a trial procedure. To avoid these costs the plaintiff and the defendant engage in a pre-trial negotiation. Suppose that the defendant holds the whole bargaining power and can make take-it-or-leave-it offer to the attorney.[9] The plaintiff is willing

[5]And in contrast with e.g., Nalebuff (1987), who models pre-trail negotiations as a screening game.

[6]There are previous models studying the effect of having access to multiple sources of information. Krishna and Morgan (2001) analyze a situation in which there are multiple experts available. Ines Moreno de Bareda (2013) describes a situation in which the client holds some private imprecise information about the state of the world.

[7]The problem of moral hazard in a civil litigation environment was studied e.g,. by Danzon (1983) and Emons (2000).

[8]Car accidents accounted for 60% of all the tort law cases filed in 1992.

[9]This is a common assumption since the defendants are typically institutions (70 % of cases in 2016) and the plaintiffs are typically individuals (82 % of cases in 2016). Moreover, the defendants gains on prolonging the

to accept a settlement exactly compensating her payoff in case of the trial: here \$900, which is indeed the offer the defendant would make.

As a second benchmark, imagine that instead of negotiating herself, the plaintiff could hand out the whole process (including the settlement decision) to a hired attorney, who faces a fixed costs of \$50 and additional \$100 for representing the plaintiff if the case is resolved by a trial. The plaintiff could offer the attorney a contract, which delegates the negotiation and the trail representation in exchange for e.g. 5% of the monetary compensation and an additional payment of \$105 if the case is resolved by trial. Under this contract, the attorney can obtain a payoff of \$55 under the trial (5% of \$1000 of obtained compensation, minus \$100 of trial costs, plus \$105 of trial premium). Thus, she will reject any offer below \$1100 (since $5\% \times 1100 = 55$). To avoid the trial, the defendant increase the offer to \$1100 giving up the whole bargaining surplus. The attorney keeps \$55 of this sum and the plaintiff enjoys additional \$145 compared to the initial case.[10]

In reality, although the negotiation process is usually handled by the attorney, the plaintiff cannot delegate the final decision.[11] Still, the plaintiff can gain on hiring the attorney. In a third benchmark suppose that the plaintiffs offers to the attorney a contract which still promises 5% of the compensation in exchange for trial representation, but does not include any extra payment if the negotiation fails. Since the plaintiff does not face any costs of trial anymore she is not willing to accept any settlement below the liability value. To avoid the trial the defendant makes the offer an offer \$1000, keeping half of the bargaining surplus for itself. The attorney obtains \$50 and the plaintiff enjoys \$950 of the compensation, \$50 more than in the first benchmark.

Note that in all the benchmarks the attorney increased the overall costs of the lawsuit, and contributed to the litigation only by enabling strategic contracting. In reality, the attorneys hold knowledge about applicable rules and provide their uninformed clients a legal advise. On the contrary, the institutional defendants might have faced similar cases in the past or can have professional lawyers employed, hence they hold an informational advantage over the individual plaintiffs.

Suppose that with probability 0.8 the court finds the defendant guilty and evaluates the liability at \$1250, but with probability 0.2 the court deems the evidence insufficient and plaintiff receives no compensation. The defendant is capable of recognizing the true state of the world, but the plaintiff lacks knowledge on the applicable legal rules and observes only the distribution of the liability values. However, after receiving the offer she can turn to her attorney, who also recognizes the liability value, for an advice on whether the case should be settled or resolved by a trial.

Suppose the plaintiff offered to the attorney the same contract as in the third benchmark, that is payoff of 5% of the obtained compensation. Under this contract the attorney prefers settling on any positive amount than resolving the case by trial (since the attorney's payoff

negotiations and delaying the payment, wheres the plaintiff prefers to obtain the compensation as early as possible.

[10] In the optimal contract the plaintiff can also ask the attorney for an additional fixed transfer of \$5, so that the participation constraint of the attorney is binding.

[11] The regulation forbid attorneys accepting or rejecting the settlements unilaterally, with exception of collective litigation in which single attorney represents multiple plaintiffs. In some extreme cases the disagreement between the lawyer and her client may lead to withdrawing the power of the attorney. For simplicity, I ignore this possibility throughout the paper, supposing that given the initial costs of investigation are already sunk it is always better for the attorney to proceed with the case. The main results do not change if this assumption is relaxed by introducing an additional participation constraint.

under the trial is $5\% \times \$1250 - \$100 = -\$37.5$ if the defendant is guilty and $-\$100$ otherwise). Thus, following his own interest, the attorney would always recommend the settlement and the plaintiff should not relay on his advice.

In order to receive a meaningful communicate from her attorney the plaintiff has to raise the share of the compensation paid for the attorney to 8%. Since the liability value can be only either 0 or \$1250, and the plaintiff does not bear any costs of trial, she expects receiving only one of these two offers. Suppose the defendant is in fact guilty. It can try to mimic an innocent defendant and offer 0 to the plaintiff. However, in this case the attorney would correctly advise his client to go to trial (since his payoff under the trial is $8\% \times \$1250 - \$100 = 0$, which is exactly the same as his payoff under the settlement), and the plaintiff would follow this advise. Thus in order to avoid the trial the defendant makes a truthful offer of \$1250 when guilty and 0 when innocent. The plaintiff earns on average \$920, which is still above first benchmark scenario. In fact, by proposing an optimal contract that also includes a fixed transfer of \$30 from the attorney to the plaintiff, she could replicate on average her payoff from the third benchmark scenario.

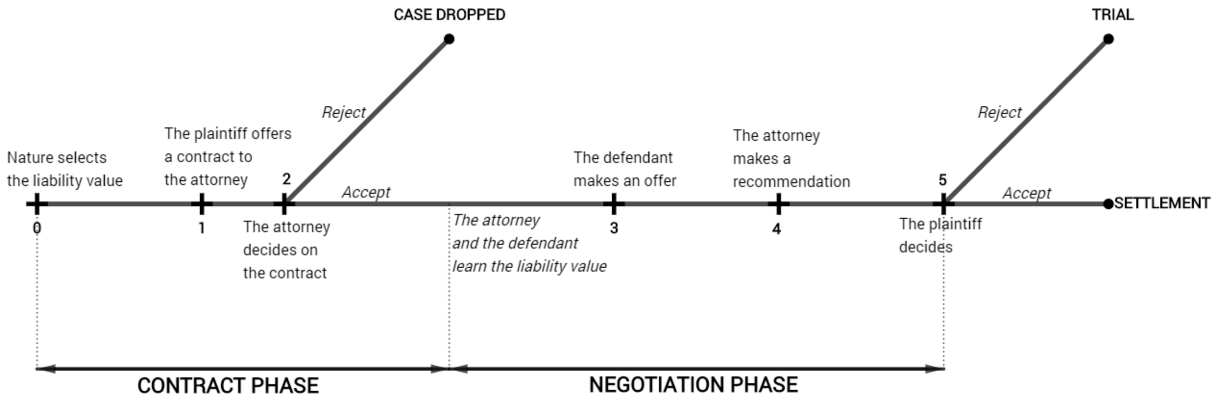
Suppose now that the plaintiff faces uncertainty of a different type. With probability 0.8 she receives only compensatory damages of \$750, but with probability 0.2 she could get also high punitive damages obtaining \$2000 of compensation in total. In this situation the contract described above turns out not to be optimal. The plaintiff could improve e.g. by proposing to the attorney a contract described in the second benchmark, that is a right to 5% of compensation and additional payment of \$105 in case of trial. As long, as the liability value is high the plaintiff looses on such an agreement – since she cannot ever obtain more than \$1795 under the trail (because $95\% \times \$2000 - \$105 = \$1795$), the defendant makes the smallest offer that provides her this payoff, namely \$1890 ($95\% \times 1890 \approx 1795$). The plaintiff does not need an advise of her attorney in this situation and always accepts the offer. If the liability offer is low, the defendant could try the same strategy, proposing to the plaintiff \$640, which compensates her true payoff under the trial. However, the attorney would not recommend accepting such an offer, since he would earn only \$32 under this settlement compared to \$42.5 under the trial. In turn, observing a negative recommendation the plaintiff is not capable of recognizing whether she is deceived by her attorney or the liability value is high and the offer should not be accepted; thus she would decide to resolve the case by trial. Thus, in order to avoid costly trial the defendant must ensure a positive recommendation of the attorney. So, the defendant must make an offer of \$850 (as $5\% \times \$850 = \$42.5$, that is attorney's payoff under the trial), giving up the whole bargaining surplus. If the liability value is low, the plaintiff manages to replicate her payoff from the second benchmark, and she obtains over \$1000 on average – more than was achievable in the third benchmark.[12]

3 Model

I model civil litigation as a sequential game of incomplete information between three risk-neutral agents: the plaintiff (she), the attorney (he), and the defendant (it). I call the game *the litigation game*. It consists of two main parts: *the contract phase* and *the negotiation phase*. The structure of the game is presented in Figure 1.

[12] In fact the plaintiff could obtain even \$1010 by offering an optimal contract that includes \$50 of a fixed payment and \$100 of an additional payment in case of trial.

Figure 1: The litigation game



The game begins with the plaintiff suffering some loss for which the defendant is liable. At $\tau = 0$ nature selects the value of the liability drawing it from a commonly known uniform distribution along a range of $[0; \overline{x}]$. [13]

After the value of the liability is realized, but before it is observed by any agent, *the contract phase* of the game begins. At $\tau = 1$, the plaintiff and the attorney agree on a contract C. I assume that the contract is proposed by the plaintiff to the attorney, however the results are independent from the choice of the agent making an offer. Contract C can depend only on the monetary payoff and the way the case was resolved, since unrealized settlement offers and attorney's recommendation are not verifiable. For simplicity I suppose it is linear consists of four elements. The attorney receives part of his payment independently from the way the case was resolved: $f_n \in \mathbb{R}$ denotes the basic fixed payment of the attorney, and $s_n \in [0; 1]$ basic payment for the attorney in a form of a share of the compensation. The plaintiff may also offer additional payment for her attorney for trial representation: $f_t \in \mathbb{R}_+$ denotes an additional fixed payment for the attorney in case of a trial;[14] and $s_t \in [0; 1 - s_n]$ denotes an additional share payment for the attorney in case of a trial.

At $\tau = 2$, after observing the contract, the attorney decides whether to accept it. If the attorney rejects the contract, *the case is dropped*. If the attorney accepts the contract, he investigates the case at a cost c. At the end of this period both the defendant and the attorney learn the liability value realization x. Then *the negotiation phase* begins.

At $\tau = 3$ the defendant, having already observed the liability value, makes a take-it-or-leave-it offer $y \in \mathbb{R}_+$.

At $\tau = 4$, after observing the offer and the liability value, the attorney makes a recommendation r on whether the plaintiff should accept ($r = 1$) or reject ($r = 0$) the offer.

At $\tau = 5$ the plaintiff, having received both the offer and the recommendation, takes the decision p. She can either accept the offer ($p = 1$) ending the case by *the settlement*, or reject

[13]There is an alternative interpretation for this way of modeling the value of the case. It can be that the actual value of the liability is known and is of a size $\overline{x}$, however, the probability of prevailing during the trial (P uniformly distributed along a range of $[0; 1]$) is not known initially and requires some analysis by the attorney. Then the expected liability value $P\overline{x}$ remains uniformly distributed on the range of $[0; \overline{x}]$.)

[14]f_t is supposed to be non-negative following the standard regulation forbidding an attorney to be charged for a trial.

Table 1: Payoffs in the litigation game

	Plaintiff	Attorney	Defendant
Case dropped	0	0	0
Settlement	$(1-s_n)y-f_n$	$s_n y+f_n$	$-y$
Trial	$(1-s_n-s_t)x-f_n-f_t$	$(1+s_n+s_t)x+f_n+f_t-t^a$	$-y-t^d$

the offer ($p=0$) and end the case by *trial*.

If the case is settled, the defendant makes a promised transfer (y) to the plaintiff, who afterwards transfers the agreed compensation to her attorney.

In case of a trial the defendant and the attorney pay the fixed costs of the trial (t^d and t^a respectively), the court learns and asses the liability value forcing the defendant to make a transfer x to the plaintiff. Afterwards, the plaintiff transfers the agreed compensation to her attorney. The payoffs of each of the players are summarized in table 3.

Since *the litigation game* is an extensive form game of incomplete information I use perfect Bayesian equilibrium (Fudenberg and Tirole 1991) as the solution concept. In *the litigation game* a PBE is constituted by a strategy profile of all the players and beliefs of the plaintiff such that all the players are sequentially rational and the beliefs of the plaintiff are derived using the Bayes' rule on the equilibrium path. I restrict attention to equilibria in pure strategies; from now on I refer to them simply as PBE.

The litigation game merges features of a standard signaling game (the interaction between the plaintiff and the defendant) and a cheap talk game (the interaction between the plaintiff and the attorney); thus, it generates a plethora of equilibria.

Firstly, as in any cheap-talk game, there always exist babbling equilibria, under which the information between the plaintiff and the attorney is not transmitted only because none of the agents believe it may be transmitted. For example, the attorney may always recommend acceptance of the settlement offer because he believes that the plaintiff will ignore the recommendation anyway. In this case the plaintiff indeed ignores the attorney's recommendation, since she correctly believes that it is independent from the liability value realization and carries no information.

Secondly, PBE imposes a restriction on the beliefs about the liability the plaintiff can hold on the equilibrium, but does not specify a way in which the plaintiff forms her beliefs out-of-equilibrium . The freedom in choosing out-of-equilibrium beliefs generates multiplicity of equilibria. Particularly, if the plaintiff has very high expectations about the liability value out-of-equilibrium, equilibria in which her bargaining position of the is artificially strengthen can be always sustained.[15]

To avoid these problems I focus on defendant's preferred equilibria. In these equilibria the communication between the plaintiff and the attorney is successful whenever possible, and what follows the trial is avoided as often as possible. Moreover, the bargaining position of the plaintiff is not an artifact of out-of-equilibrium beliefs, but follows from the incentives of the plaintiff and the attorney. All the described equilibria satisfy intuitive criterion (Cho and Kreps 1987)

[15]For example, the plaintiff may believe that whenever the offer y is lower than the defendant's costs of trial (t^d) the liability value is the highest possible ($\bar{x}$). In order to avoid the trail the defendant would always increase its offer to the threshold level, any lower offer would not be a part of the equilibrium path and the beliefs of the plaintiff would remain consistent.

In the following sections I solve *the litigation game* by backward induction. Firstly (section 3), I analyze the negotiations process treating the agents' incentives as given. Secondly (section 4), I analyze which contract is signed by the agents at equilibrium.

4 Negotiation phase

Once the contract has been signed the negotiation begins. Depending on the particularities of $C = (f_n, s_n, f_t, s_t)$ the negotiation can lead to different types of equilibria: completely pooling, partially pooling or separating. The negotiation can end in a settlement or in a trial. Finally, the attorney's recommendation may be relevant or ignored by the plaintiff.

In this section I analyze the outcome of the negotiation for any contract. At first, I focus on the simpler contracts, for which s_t is set to 0. Then I describe the contracts with positive $s_t > 0$. The section starts with a discussion about the incentives of the agents as a function of the contract.

4.1 Agents' incentives

Before describing the outcome of the negotiation, it is worth understanding what drives agents' behavior. In this subsection I analyze how a contract with $s_t = 0$ shapes agents' incentives to settle and to go to trial.

For each agent I define *the willingness to settle* – the amount of money the agent is willing to give up from the judged compensation in order to avoid a trial. Since the defendant's costs of the trial are exogenous, the defendant is always willing to pay the additional amount t^d in order to avoid trial; that is, the defendant's willingness to settle is t^d

The incentives of the attorney are contract-dependent. He is ready to accept any settlement offer y that at least compensates his payoff under the trial: $s_n y \geq s_n x - t^a + f_t$. In other words, as long as $s_n > 0$ the attorney's willingness to settle is:

$$\varsigma^a(C) \equiv \frac{t^a - f_t}{s_n} \tag{1}$$

If $f_t < t^a$ the attorney is ready to accept an offer smaller than the judged compensation, because he bears some costs of trial. If $f_t > t^a$, the attorney is overpaid for the trial, and his willingness to settle is negative. In other words, the attorney expects an additional payment for giving up the possibility of the trial.

For $s_n = 0$ the attorney's payment is independent from the liability value and the offer made. If $f_t < t^a$ the attorney always wants to avoid a trial so $\varsigma^a(C) \equiv +\infty$. In contrast, if $f_t > t^a$, the attorney always prefers the trial to the settlement and $\varsigma^a(C) \equiv -\infty$. Finally, if $f_t = t^a$ the attorney is always indifferent and $\varsigma^a(C)$ can take any value.

An example of the attorney's strategy satisfying written in terms of his willingness to settle is:

$$r^a(x, y) \equiv \begin{cases} 1 & \text{if } y \geq x - \varsigma^a(C) \\ 0 & \text{if } y < x - \varsigma^a(C). \end{cases} \tag{2}$$

Under this strategy the plaintiff always recommend the settlement if and only if he weakly prefers it to a trial.

Analogous analysis can be done for the plaintiff. Firstly, suppose the plaintiff was aware of the realized liability value. She would be willing to settle at any offer y that at least compensates her payoff under the trial: $(1 - s_n)y \leq (1 - s_n)x - f_t$. As long as $s_n < 1$, the plaintiff's willingness to settle is given by:

$$\varsigma^p(x; C) \equiv \frac{f_t}{1 - s_n} \tag{3}$$

If $s_n = 1$, the plaintiff's payoff is constant over the liability values. Thus, she would always avoid the trial if $f_t > 0$, which sets her willingness to settle to $\varsigma^p(C) \equiv +\infty$. If $f_t = 0$ the plaintiff is always indifferent between the trial and the settlement and $\varsigma^p(C)$ can take any value.[16]

The plaintiff's willingness to settle also can be translated to her best response. An example of plaintiff's strategy that is always a best response is:[17]

$$p^{BR}(y, r) \equiv \begin{cases} 1 & \text{if } y \geq \mathbb{E}^p[x|y, r] - \varsigma^p(C) \\ 0 & \text{if } y < \mathbb{E}^p[x|y, r] - \varsigma^p(C) \end{cases} \tag{4}$$

Finally, it is useful to define *the congruence coefficient* at a given contract $\Phi(C)$, which measures the difference between the attorney and the plaintiff's willingness to settle

$$\Phi(C) \equiv \varsigma^p(C) - \varsigma^a(C) \tag{5}$$

The coefficient $\Phi(C)$ answers the question of "how much an offer under which the plaintiff is willing to settle must be increased in order to convince the attorney." The sign of Φ determines the more aggressive agent: if $\Phi > 0$, the attorney is less willing to settle than the plaintiff; if $\Phi < 0$ the attorney is more willing to settle. Finally, if $\Phi = 0$, the incentives of the agents are perfectly aligned.

4.2 Negotiation phase equilibria

If the information was complete, the defendant could ignore the attorney and offer the plaintiff a settlement that compensates her payoff under a trial:

$$y^{CI}(x) \equiv \max\{0, x - \varsigma^p(C)\} \tag{6}$$

The plaintiff, knowing the true realization of the liability value, would always agree on such a settlement offer, independently of the attorney's recommendation.

However, in the asymmetric information environment the settlement offer plays a triple role. It not only frames the settlement terms, but also signals the liability value to the plaintiff. The higher the offer, the higher the plaintiff's expectations of judged compensation are. Finally, the offer made triggers a recommendation of the attorney which can play a relevant role in this

[16] The indeterminacy of $\varsigma^a(C = (f_n, s_n = 0, f_t = t^a, s_t = 0))$ and $\varsigma^a(C = (f_n, s_n = 1, f_t = 0, s_t = 0))$ can be resolved at the equilibrium; this problem is further discussed in section 4.

[17] This function supposes that (unless the contract is $f_t = 0$ and $s_n = 1$); the plaintiff accepts the offer while indifferent, there exist also another strategies that are always a best response for the plaintiff. For example always rejecting while indifferent.

environment. Since the plaintiff does not know the true liability value, she may condition her decision on the informed attorney's recommendation. However, she cannot blindly follow the attorney, because their incentives may differ, and the attorney's recommendation follows his own interest rather than the interest of his client. Depending on how the incentives of the attorney and the plaintiff are set, the negotiation can follow one of four possibles scenarios described in the following subsections: *perfectly informative equilibrium* (when $\Phi(C) = 0$), *misinformative equilibrium* (when $\Phi(C) > 0$), *partially informative equilibrium* (when $\Phi(C) < 0$), and *uninformative equilibrium* (when $|\Phi(C)| >> 0$).

4.2.1 Completely aligned incentives

If $\Phi(C) = 0$, the incentives of the plaintiff and the attorney are completely aligned. The plaintiff can always trust her attorney and may simply follow his recommendation. This situation, replicates exactly the complete information scenario, thus I refer to it as *perfectly informative equilibrium*.

Proposition 1. *Consider a contract C for which $\Phi(C) = 0$. Then there exists a PBE of the negotiation phase called perfectly informative equilibrium in which:*

(i) The defendant's offer is:

$$y(x) = \max\{x - \varsigma^p(C); 0\}; \tag{7}$$

(ii) The attorney's recommendation is:

$$r(x, y) = r^a(x, y); \tag{8}$$

(iii) The plaintiff's decision is:

$$p(y, r) = \begin{cases} r \text{ if } y < \overline{x} - \varsigma^p(C) \\ 1 \text{ if } y \geq \overline{x} - \varsigma^p(C). \end{cases} \tag{9}$$

4.2.2 Aggressive attorney

If $\Phi > 0$, the plaintiff is more willing to settle than the attorney. Thus, whenever the plaintiff observes a positive recommendation from her attorney, she knows the offer is good enough to be accepted.

However, interpreting the negative recommendation is not simple for the plaintiff. On one hand, the plaintiff may believe that the defendant is trying to take an advantage of her lack of information to make an unacceptably low offer. On the other hand, she may believe that the offer is indeed profitable, but the attorney is trying to deceive her in order to obtain the trial premium.

At equilibrium, if the plaintiff observes some too low offer and a negative recommendation, she should reject it. She would think that there are more possible liability value realizations under which the observed offer is unacceptably low (and the defendant is trying to take advantage of plaintiff's lack of information), than those under which the offer should be indeed accepted. The opposite happens when the offer is high, even if the recommendation is negative.

The plaintiff would realize that there are more possible liability value realization under which the offer should be indeed accepted (and the attorney is just trying to obtain the trail premium). Thus, the offer is accepted.

Notice that for very high liability values, the defendant does not need to bother with convincing the attorney, it can simply make the lowest offer, which will always be accepted by the plaintiff.

I denote such an offer by $\dot{y}$. Also, I denote the lowest liability value under which $\dot{y}$ is made by $\dot{x}$. The values of $\dot{y}$ and $\dot{x}$ are as follows:

$$\dot{y} = \max\{0; \frac{\overline{x}}{2} - \varsigma^p(C); \overline{x} - 2\varsigma^p(C) - t^d; \overline{x} - \Phi(C) - \varsigma^p(C)\} \tag{10}$$

$$\dot{x} = \max\{0; \overline{x} - 2\varsigma^p(C) - 2t^d; \overline{x} - 2\Phi(C)\} \tag{11}$$

In a well-behaving case, the pair $(\dot{x}, \dot{y})$ solves the following system of equations:

$$\begin{cases} \dot{y} - \varsigma^p(C) = \frac{1}{2}(\overline{x} + \dot{x}) \\ \dot{x} - \min\{t^d, -\varsigma^a(C)\} = \dot{y} \end{cases} \tag{12}$$

The first condition states that a perfect Bayesian plaintiff is indifferent between accepting and rejecting offer $\dot{y}$. The second condition states that the defendant at liability value $\dot{x}$ is indifferent between making an offer $\dot{y}$ and a trial (or ensuring the settlement by obtaining positive recommendation of the attorney). In these cases $\dot{y} = \max\{\overline{x} - 2\varsigma^p(C) - t^d; \overline{x} - \Phi(C) - \varsigma^p(C)\}$ and $\dot{x} = \{\overline{x} - 2\varsigma^p(C) - 2t^d; \overline{x} - 2\Phi(C)\}$. It may also happen that the equilibrium becomes completely pooling ($\dot{x} = 0$) and $\dot{y}$ simply compensates the average payoff of the plaintiff under the trial ($\dot{y} = \max\{0; \overline{x} - 2\varsigma^p(C) - 2t^d\}$).

The behavior of the defendant for liability values below $\dot{x}$ depends on the incentives of the attorney. If the attorney does not gain too much by resolving the case by trial ($\varsigma^a(C) \geq -t^d$), then it is profitable for the defendant to increase the overall offer, convince the attorney to make a positive recommendation, and ensure a settlement, rather than face trial. This scenario is presented in Figure 2. Since it is driven by the attorney misleading his client in order to obtain the trial payoff, I refer to this equilibrium as a *misinformative equilibrium*.

On the other hand, if the attorney is overly aggressive ($\varsigma^a(C) < -t^d$) then the offer under which he is willing to make a positive recommendation becomes so high that the defendant would rather face a trial than convince the attorney.[18] This scenario is presented in Figure 3. Since no information is transited between the attorney and plaintiff at equilibrium, I refer to this situation as an *uninformative equilibrium*.

Proposition 2. *Consider a contract C for which $\Phi(C) > 0$ and $\varsigma^a(C) \geq -t^d$. Then there exists a PBE of the negotiation phase called misinformative equilibrium in which:*

(i) The defendant's offer is:

$$y(x) = \begin{cases} 0 \textit{ if } x < \varsigma^a(C) \\ x - \varsigma^a(c) \textit{ if } x \in [\varsigma^a(C); \dot{x})] \\ \dot{y} \textit{ if } x > \dot{x}; \end{cases} \tag{13}$$

[18] I apply a convention that in this situation an offer $y = 0$ is made. There exist also equilibria at which the defendant makes some other offers. However, in any equilibrium the case is resolved by trial for liability values $[0; \dot{x})$.

Figure 2: Misinformative equilibrium

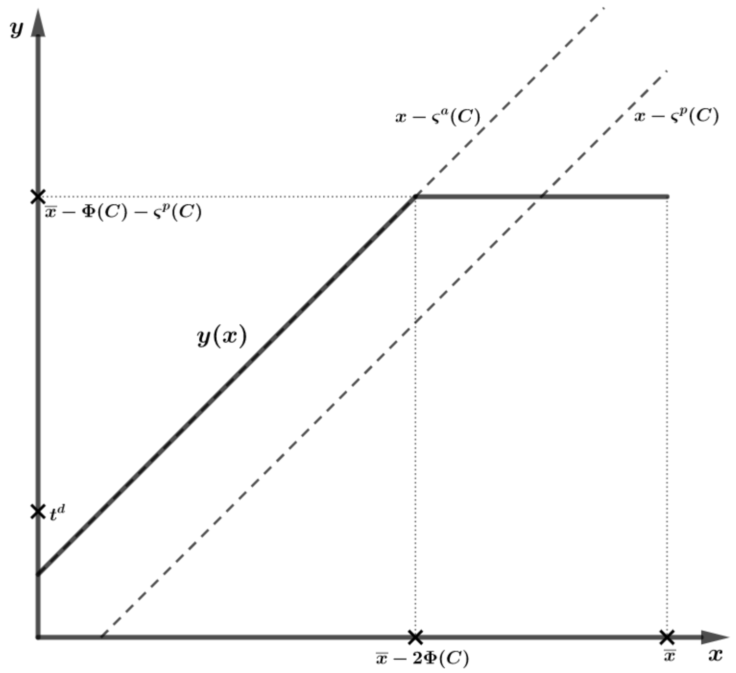
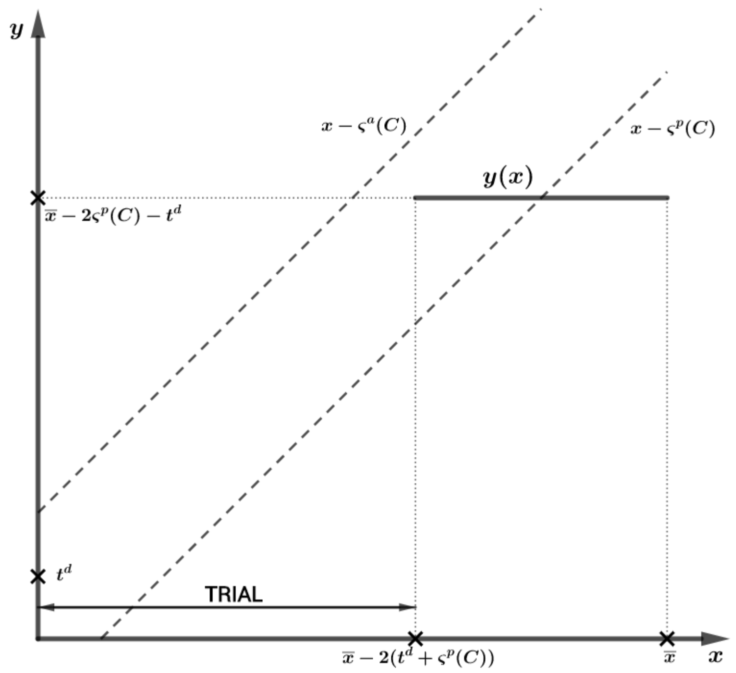


Figure 3: Uninformative equilibrium (aggressive attorney)



(ii) the attorney's recommendation is:

$$r(x,y) = r^a(x,y); \tag{14}$$

(iii) the plaintiff's decision is:

$$p(y,r) = \begin{cases} r \text{ } \textit{if } y < \dot{y} \\ 1 \text{ } \textit{if } y \geq \dot{y}. \end{cases} \tag{15}$$

Proposition 3. *Consider a contract C, for which $\Phi(C) > 0$ and $\varsigma^a(C) < -t^d$. Then there exists a PBE of the negotiation phase called uninformative equilibrium in which:*

(i) The defendant's offer is:

$$y(x) = \begin{cases} 0 & \textit{if } x < \dot{x} \\ \dot{y} & \textit{if } x \geq \dot{x}; \end{cases} \tag{16}$$

(ii) the attorney's recommendation is:

$$r(x,y) = r^a(x,y); \tag{17}$$

(iii) the plaintiff's decision is:

$$p(y,r) = \begin{cases} 0 & \textit{if } y < \dot{y} \\ 1 & \textit{if } y \geq \dot{y}. \end{cases} \tag{18}$$

4.2.3 Aggressive plaintiff

If $\Phi < 0$, the attorney is more willing to settle the case than the plaintiff. Thus, whenever the plaintiff observes a negative recommendation from her attorney, she knows the offer is too low to be accepted.

However, a positive recommendation does not have a simple interpretation for the plaintiff. It can be the case that the liability value is low and the offer should indeed be accepted by the plaintiff. However, it also can be the case that the liability value is high and the offer should be rejected, but the attorney tries to deceive his client in order to avoid a costly trial.

Despite the misalignment in the attorney and plaintiff's incentives, a positive recommendation may still carry some information and the trail can hereby be avoided. Imagine the plaintiff observes some offer y and a positive recommendation. She can still recover the worst and the best case scenario liability values. The best case liability value is inferred from the attorney's recommendation: the plaintiff realizes that the liability value cannot exceed the offer by more than the attorney's willingness to settle ($x \leq y + \varsigma^a(C)$); since otherwise a positive recommendation would never been made. The plaintiff can determine the worst case scenario liability from her own behavior. She knows which lower offers she was willing to accept, given the positive recommendation of the attorney. So she can conclude that none of these offers would lead to the defendant obtaining a positive recommendation($x \geq y' + \varsigma^a(C)$, for $y' = \max\{y'' < y | p(y'', r = 1) = 1\}$). Otherwise, the defendant wold make such an offer and enjoy settlement on better terms.

The plaintiff is willing to accept some offer (y) after she receives a positive recommendation, as long as the best case scenario liability value is sufficiently close to the offer made, and the worst case scenario liability value is sufficiently far ($\frac{1}{2}(y' + \varsigma^a(C) + y + \varsigma^a(C)) - \varsigma^p(C) > y$). Simply speaking, the amount of liability values at which the plaintiff expects to be worse off under the trial than under the settlement must be at least as high as those at which the plaintiff expects to be better off. For this to happen, the offers the plaintiff is willing to accept given a positive recommendation must be sufficiently spread. In other words, there can be only a finite number of offers that the plaintiff is ever willing to accept.[19]

Those offers can be thought as "standard" offers, typically made for a given case. If the plaintiff receives such an offer, she considers the recommendation of her attorney. However, if she receives some untypical settlement proposal, she believes it has been made in order to deceive her and always rejects it.

Knowing how the plaintiff will behave, the defendant sticks to the standard offers. For some cases it means that it overpays compared to complete information, in other cases it can obtain a settlement at a lower offer. On average, the payoffs of both the plaintiff and the defendant are equivalent to the complete information scenario.

Given that in this case the attorney transmits only some information to the plaintiff, the equilibrium is called a *partially informative equilibrium*. It is depicted in Figure 4. An example of it is given below.

Example 1. *Imagine the plaintiff litigates against the defendant for a liability of value between* 0 *and* $\$40$*. To proceed with the procedure she hires an attorney under contract* $C = (f_n = 0, s_n = 0.5, f_t = \$5, s_t = 0)$*. The trial is equally costly for the attorney and the defendant:* $t^a = t^d = \$15$*. In this case, the plaintiff's willingness to settle is* $\varsigma^p(C) = \frac{\$5}{0.5} = \$10$*, the attorney's willingness to settle is* $\varsigma^a(C) = \frac{\$15 - \$5}{0.5} = \$20$*, and the congruence coefficient is* $\Phi(C) = \$10 - \$20 = -\$10$*.*

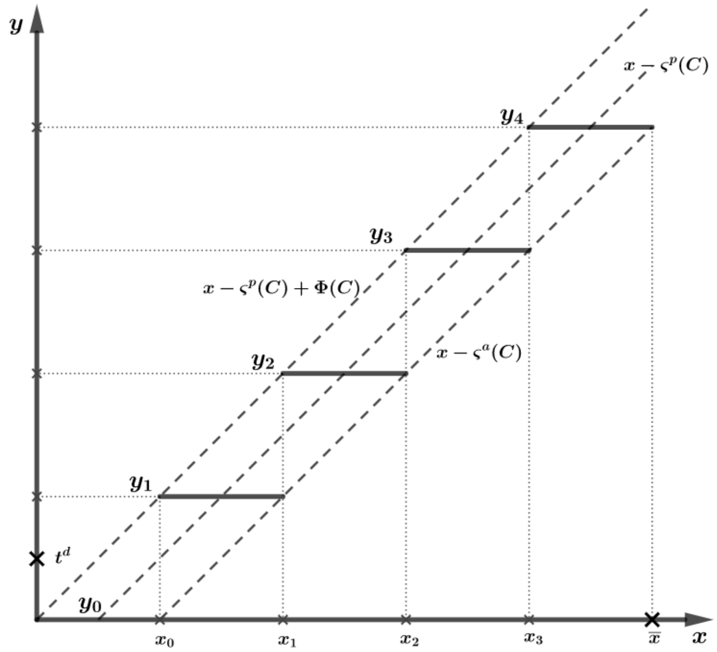
Additionally, suppose that in this case there two standard offers. If the harm was low the cases are typically dropped (offer $y = 0$ *is accepted), whereas* $y = \$20$ *is typically offered if the harm was high.*

Firstly, I analyze the best response of the defendant, if it believes that the plaintiff is indeed ready to accept $y = 0$ *and* $y = \$20$ *given a positive recommendation of the attorney. Since* $\varsigma^a(C) = \$20$*, the attorney is willing to give up to* $\$20$ *from the liability value in order to obtain a settlement. In other words, he will recommend accepting* $y = 0$ *for any liability value not greater than* $\$20$ *and will accept* $y = \$20$ *for all the other liability values (since* $\overline{x} = \$40$ *and* $\$40 - \$20 = \$20$*). Thus, the defendant will insist on dropping the case if* $x \leq \$20$ *and will offer* $\$20$ *to otherwise settle.*

Secondly, I verify whether a Bayesian plaintiff should indeed accept those offers. If she observes $y = 0$ *and a positive recommendation, she correctly believes that the liability value is uniformly distributed between* 0 *and* $\$20$*. Then her expected payoff under the trial is* $0.5(1/2(0 + \$20) - \$5) = 0$*, and her expected payoff under the settlement is* $0.5 \times 0 = 0$*. So she accepts the decision to drop the case. Analogously, if she receives* $y = 20\$$ *and a positive recommendation of the attorney, she correctly believes that the liability value is uniformly distributed between* $\$20$ *and* $\$40$*. Then her expected payoff under the trial is* $0.5(\frac{1}{2}[\$20 + \$40]) - \$5 = \$10$ *and her expected payoff under the settlement is* $0.5 \times \$20 = \$10$*. So she also accepts the settlement.*

[19] More precisely, there is a finite number of not overly high offers the plaintiff is willing to accept. For example, a rational plaintiff would always accept an offer higher than $\overline{x}$.

Figure 4: Partially informative equilibrium



To formally describe a partially informative equilibrium, I derive two sequences. The first sequence (x_k) divides the continuum of liability values in subintervals. In each subinterval (x_k, x_{k+1}) the defendant makes one standard offer (y_k). The sequence of standard offers constitutes the second sequence.

Each standard offer (y_k) must satisfy two conditions. Firstly, the plaintiff cannot lose on average on accepting it, that is, $(\frac{1}{2}(x_k + x_{k+1}) - \varsigma^p(C) \leq y_k$. Secondly, the defendant cannot have an incentive to make any other offer, that is, for all $x \in (x_k, x_{k+1})$ and $-y_k > -x - t^d$ and there does not exist $y' < y_k$ s.t. $p(y', r(y')) = 1$. The sequences satisfying these properties are recursively defined below.

$$x_0 = \mathbb{1}_{-\Phi(C) < \varsigma^p(C)} \varsigma^a(C) \tag{19}$$

$$x_{k+1} = x_k - 2\Phi(C) \tag{20}$$

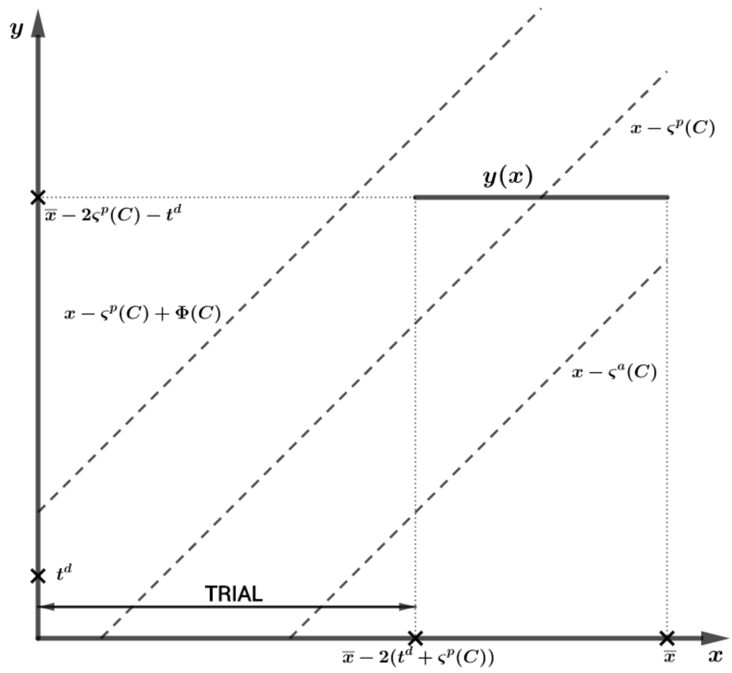
$$y_k = \frac{1}{2}(x_k + x_{k+1}) - \varsigma^p(C) \tag{21}$$

Note that, the first subinterval of liability values $((0, x_0))$ at which an offer 0 is made can be empty $(x_0 = 0)$. Finally, the liability values close to $\overline{x}$ constitute the separate group $(x_K, \overline{X})$.

$$K \equiv \min\{k \in \mathbb{N} | x_{k+1} \geq \overline{x}\} \tag{22}$$

$$y_K = \frac{1}{2}(x_K + \overline{x}) - \varsigma^p(C) \tag{23}$$

Figure 5: Uninformative equilibrium (aggressive plaintiff)



Then, the set of acceptable offers $\mathbf{Y}^*$ contains all the elements of the y_k sequence for $k < K$, y_K and 0 if $-\Phi(C) < \varsigma^p(C)$.

This equilibrium exists only if the incentives of the plaintiff and the attorney are not too misaligned ($\Phi(C) + \varsigma^p(C) \geq -t^d$). Otherwise, the defendant prefers to go to trial rather than make a standard offer for some liability values. The attorney's recommendation looses its value and the equilibrium becomes uninformative. The uninformative equilibrium with an aggressive plaintiff is depicted in Figure 5.

Proposition 4. *Consider a contract C for which $\Phi(C) < 0$ and $\Phi(C) + \varsigma^p(C) \geq -t^d$. Then there exists a PBE of the negotiation phase called partially informative equilibrium in which:*

(i) The defendant's offer is: [20]

$$y = \begin{cases} 0 & \textit{if } x \leq x_0 \\ y_k & \textit{if } x \in (x_k; x_{k+1}] \textit{ and } k < K \\ y_K & \textit{if } x > x_K; \end{cases} \tag{24}$$

(ii) the attorney's recommendation is:

$$r(x, y) = r^a(x, y); \tag{25}$$

[20]If $x_0 = 0$, the offer $y = 0$ is never made on the equilibrium path, and if the liability value is s.t. $x = x_0 = 0$ the defendant makes an offer y_0. If $x_0 > 0$ and the liability value is s.t. $x = x_0$ the defendant makes an offer 0.

(iii) the plaintiff's decision is:

$$p(y) = \begin{cases} 0 & \textit{if } y \notin \mathbf{Y}^* \textit{ and } y < y_K \\ r & \textit{if } y \in \mathbf{Y}^* \textit{ and } y < y_K \\ 1 & \textit{if } y \geq y_K. \end{cases} \tag{26}$$

Proposition 5. *Consider a contract, for which $\Phi(C) < 0$ and $\Phi(C) + \varsigma^p(C) < -t^d$. Then there exists an uninformative equilibrium satisfying in which the defendant, the attorney, and the plaintiff follow the strategies described in Proposition 3.*

Table 4.2.3 presents the comparison of the equilibria in terms of: expected total gain of the attorney and the plaintiff, negotiation outcome, agent relevant for generating the offer and existence condition. Note that each equilibrium can potentially become completely pooling, as a consequence of the plaintiff being radically willing to settle. The defendant can then simply make an offer $\dot{y}$ (or y_K in case of partially informative equilibrium) for every liability value.

Uninformative equilibrium is the only one, at which the trial is not avoided. The reduction in plaintiff's willingness to settle always increases the profits of the plaintiff side, as long as the constraints on equilibrium existence are satisfied. The attorney's willingness to settle plays an additional role only at misinformative equilibrium – it initially increases the payoff, but then starts having a negative effect for too high values.

4.3 Agents' behavior under contracts with trial premium in the form of a share

If the contract includes a positive share trial premium ($s_t > 0$), the agents' willingness to settle is not constant over liability values:

$$\varsigma^p(x; C)'_x = \frac{s_t}{1 - s_n} \tag{27}$$

$$\varsigma^a(x; C)'_x = -\frac{s_t}{s_n} \tag{28}$$

The plaintiff's willingness to settle is increasing with the liability value realization, whereas the attorney's willingness to settle is decreasing. The pace of this process depends on both share payments included in the contract.

Consequently, $\Phi(x; C)$ is increasing in the liability value realization. Thus, the negotiation may follow different scenarios, depending on the liability value realization. For very low liability values the equilibrium behaves as if it was uniformative, as the liability value increases, the equilibrium becomes partially informative and then misinformative. For very high liability values it again behaves in an uniformative manner. The thresholds are presented in Figure 6.

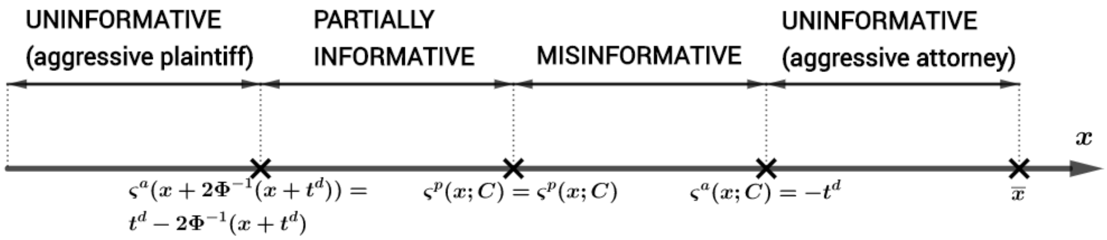
The equilibria under a contract positive s_t are described in detail in the Appendix F. I derive the thresholds at which the equilibrium changes its properties – importantly, the order of the thresholds is always the same, though it may happen that properties of some equilibria types are not exhibited.[21]

[21] Since some thresholds may appear below 0 or above $\overline{x}$.

Table 2: Equilibria comparison

	Total expected profit of the plaintiff and the attorney	Outcome	Pivotal agent	Existance
Perfectly inf.	$\frac{\overline{x}}{2} - t^a + \frac{1}{2}\frac{(t^a)^2}{\overline{x}}$	Settlement	Identical preferences	$\Phi(C) = 0$
Misinf.	$\frac{\overline{x}}{2} - \varsigma^a(C) - \frac{2\Phi(C)^2}{\overline{x}} + \mathbb{1}_{\varsigma^a(C)>0}\frac{1}{2}\frac{\varsigma^a(C)^2}{\overline{x}}$	Settlement	Attorney (low x); Plaintiff (high x)	$\Phi(C) > 0$
Partially inf.	$\frac{\overline{x}}{2} - \varsigma^p(C) + \mathbb{1}_{-\Phi(C)<\varsigma^p(C)}\frac{1}{2}\frac{(\varsigma^p(C)+\Phi(C))^2}{\overline{x}}$	Settlement	Plaintiff	$\Phi(C) < 0$
Uninf.	$\frac{\overline{x}}{2} - t^a + 2\frac{t^d+t^a}{\overline{x}}(t^d + \varsigma^p(C))$	Trial (low x); Settlement (high x)	Plainitff (high x)	$\|\Phi(C)\| >> 0$
C. pooling	$\max\{0; \frac{\overline{x}}{2} - \varsigma^p(C)\}$	Settlement	Plaintiff	$\varsigma^p(C) >> 0$

Figure 6: Positive s_t



5 Contract phase

Before the negotiation begins, the plaintiff and the attorney agree on the contract $C = (f_n, f_t, s_n, s_t)$, specifying both the way the compensation and the costs are shared – and thus setting the incentives for both agents. The agents can predict the expected outcome of the negotiation phase of every possible contract, which I have described in section 3. For convenience, I assume that the contract is proposed by the plaintiff. [22]

If the plaintiff does not behave strategically, she could offer some contract C leading to the perfectly informative equilibrium – setting $f_t = (1 - s_n)t^a$. Under this contract, the settlement is always reached, but the defendant obtains all the bargaining surplus $t^a + t^d$. The plaintiff gains only in avoiding a trial whenever it would lead to a negative payoff.[23]

However, the plaintiff may obtain a strategic advantage through contracting. One way of achieving this is by decreasing f_t to push the costs of the trial to the attorney and improve the plaintiff's bargaining position. To keep the incentives of the attorney at least partially aligned, the plaintiff would compensate the change in f_t by an increase in s_n. If this behavior is taken to the limit, *the case selling contract* (C^S) is signed:

$$C^S = (-\Pi + c; 1; 0; 0) \tag{29}$$

Under C^S, the plaintiff gives up the complete right to compensation, in exchange for a fixed payment that amounts to expected profits, keeping the right to make a decision to accept or reject the settlement. The contract leads to a partially informative equilibrium. Even though the attorney is willing to settle under C^S, the decision is taken by the plaintiff, who is always indifferent between the settlement and the trial and thus has a strong bargaining position. [24] The plaintiff's willingness to settle is determined at equilibrium: $\varsigma^p(C^S) = \frac{1}{2}\max\{0; t^d - t^a\}$. If $\varsigma^p(C^S)$ had taken any different value, the attorney would reject the contract, because it would either lead to a trial or to a settlement on too low offers. So the total profits of the plaintiff's

[22] In the model, since the plaintiff proposes the contract. She will receive all the surplus. However, contracts differing only by the size of f_n yield the same total surplus for the plaintiff and the attorney. Therefore, if the bargaining power is shared between the plaintiff and the attorney (or the attorney holds the bargaining power), the optimal contracts will remain the same, except that f_n will be higher.

[23] Since negative settlement offers are not allowed.

[24] Since this contract is a limit of a sequence of contracts leading to partially informative equilibrium, under which $s_n \to 1$ and $f_t \to 0$, the attorney can always offer a contract with a marginally bigger f_t and a marginally smaller s_n, to make sure that the plaintiff's preferences are strict. Note, that under C^S contract there may exist also equilibria that are better for the plaintiff. However, for these equilibria $\varsigma^p(C, x) > 0$ for some x, and then contract C^S cannot be seen as a limit of a sequence of contracts.

side under Case Selling Contract are:

$$\Pi(C^S) = \frac{\overline{x}}{2} + \min \frac{1}{2}\{0; t^d - t^a\} - c \tag{30}$$

Therefore, the bargaining surplus is either equally divided by the plaintiff's side and the defendant ($t^d > t^a$); or each side takes the part of the bargaining surplus equal to its costs ($t^d < t^a$).

It may also be the case that the recommendation of the attorney is not necessary for avoiding a trial in the first place. If the defendant's cost of trial are very high, it may be willing to always make a completely pooling offer. The contract leading to a completely pooling equilibrium is called *the pooling contract* (C^p):

$$C^P = (-\Pi + c, 0, \max\{0, \frac{\overline{x}}{2} - t^d\}; 0) \tag{31}$$

Under this contract the bargaining surplus on the plaintiff's side is equal to the smaller of trial costs $\min\{t^a, t^d\}$. The total profits of the plaintiff's side are:

$$\Pi(C^P) = \min\{\frac{\overline{x}}{2}, t^d\} - c \tag{32}$$

Finally, the plaintiff may use the information transmission process as a strategic tool. As long as the plaintiff observes a negative recommendation, at least for low offers, she can credibly threaten the defendant with a trial. By increasing f_t and decreasing s_n the plaintiff can make the attorney more and more aggressive, thus making him progressively more keen to make a negative recommendation, even for profitable offers. If this behavior is taken to a limit, *the strategic misinformation contract* (C^M) is signed:

$$C^M = (c; 0; t^a, 0) \tag{33}$$

Under C^M, the plaintiff keeps the complete right to compensation, in exchange for ensuring the attorney that all his costs would be covered. The contract leads to a misinformative equilibrium. It can be viewed as an approach to replicate strategic delegation by the plaintiff. Even though the plaintiff is very willing to settle, she is unable to recognize the real value of the liability and must rely on her attorney's recommendation. Since the attorney is always indifferent, he can always credibly threaten the defendant with recommending a trial.

The defendant, realizing that without a positive recommendation of the attorney it would face a trial, increases the offer. If the plaintiff could always credibly condition her behavior on the recommendation of the attorney, this contract would perfectly replicate strategic delegation and allow the plaintiff to recover the total bargaining surplus ($t^a + t^d$). However, for very high offers, despite the negative recommendation of the attorney, the plaintiff must realize that she should not hope for a higher payoff under a trial and, hence, her trial threat loses credibility. Thus, the plaintiff is able to recover all the bargaining surplus only if the liability value is sufficiently low. Sometimes, especially when the expected liability is relatively small compared to the aggregated costs of trial, it is actually worth sacrificing some part of the bargaining surplus for low liability values in order to increase the minimal unrejectable offer $\dot{y}$ and decrease the probability of facing it. So, increasing the disparity in the agent's incentives brings gain through improving the offers made for low liability values, but it also brings the cost of decreasing the offer made for high liability values and increasing its probability. Therefore, the incentives congruence coefficient is eventually set for $\Phi(C^M) = \min\{t^a + t^d; \frac{\overline{x}}{4}; \frac{\overline{x}-t^a}{3}\}$. [25]

The expected profits under strategic misinformation contract are:

$$\Pi(C^M) = \begin{cases} \frac{\overline{x}}{2} + \min\{t^d; \frac{\overline{x}}{4} - t^a; \frac{\overline{x}}{3} - \frac{4}{3}t^a\} - \frac{\Phi(C^M)^2}{\frac{\overline{x}}{2}} - c & \text{if } \Phi(C^M) \geq \frac{\overline{x}}{2} \\ \frac{\overline{x}}{2} - t^a - c & \text{if } \Phi(C^M) < \frac{\overline{x}}{2} \end{cases} \tag{34}$$

Proposition 7 states that one of three contracts described above (C^S, C^P, C^M) is an optimal contract if the case is worth pursuing. The choice of the contract depends on the structure of the costs and the expected value of the case. It can be described in terms of two coefficients. Firstly, *the plaintiff's cost-to-value ratio* (PCV), which describes the severity of the costs of trial compared to expected value of the case for the plaintiff's side.

$$PCV = \frac{t^a}{\frac{\overline{x}}{2}} \tag{35}$$

Secondly, *the defendant's cost-to-value ratio* (DCV), which outlines whether the defendant should be more concerned about the potential value of compensation, or the cost of a trial.

$$DCV = \frac{t^d}{\frac{\overline{x}}{2}} \tag{36}$$

Proposition 6.

(i) The strategic misinformation contract (C^M) is an optimal contract if and only if $\Pi(C^M) \geq 0$ *and:*

- *(a) either* $PCV \leq \frac{1}{4}$ *or;*
- *(b)* $PCV + DCV \leq \frac{1}{2}$.

(ii) The case selling contract (C^S) is an optimal contract if and only if $\Pi(C^S) \geq 0$ *and:*

- *(a) either* $PCV \in [\frac{1}{4}; \frac{1}{2}]$ *and* $PCV + DCV \geq \frac{1}{2}$ *or;*
- *(b)* $PCV \in [\frac{1}{2}; 1]$ *or;*
- *(c)* $PCV \geq 1$ *and* $PCV \leq DCV$.

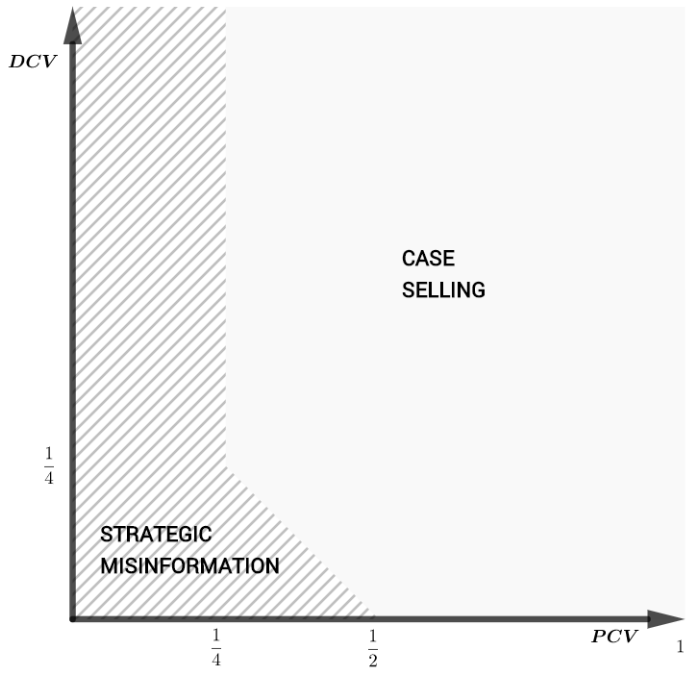
(iii) The pooling contract (C^P) is an optimal contract if and only if $\Pi(C^P) \geq 0$ *and* $DCV \geq 1$ *and* $PCV \geq \frac{1}{4}$.

(iv) Otherwise, dropping the case is optimal.

Interestingly, a contract with $s_t > 0$ is never optimal. The reason is that contracts including positive s_t make the attorney relatively aggressive for high values of x, but not for small values of x for which an aggressive attorney actually brings a strategic advantage. The optimal choice of the contract in terms of PCV and DCV is depicted in Figure 7.

[25] Which pins down the attorney's willingness to settle to $\max\{-t^d, t^a - \overline{x}4, \frac{\overline{x}-t^a}{3}\}$. If the attorney's willingness to settle was any different, the plaintiff would offer a contract with a marginally higher s_n and marginally lower f_t to ensure the strict preferences of the attorney. Under contract C^M there exist also equilibria for which $\varsigma^a(C, x)$ is not constant. They are discussed in section 5.1.

Figure 7: Contract choice



If the cost of trial for the plaintiff or the aggregated cost of trial is sufficiently small compared to the expected value of the liability, strategic misinformation is an optimal contract. Since the cost of the trial are relatively unimportant, the minimal unrejectable offer is high and the plaintiff is able to recover more than her payoff under the trial with high probability. This situation may correspond to cases like medical malpractice or major accidents, where the procedure of the trial is fairly standard (and thus the costs of trial are sufficiently low), and the compensation can reach high levels. Moreover, as Corollary 1 states, under strategic misinformation contract the plaintiff's side may obtain a higher payoff than the one achieved under complete information.

The intuition behind this surprising result is that the lack of information gives the plaintiff an opportunity to credibly condition her decision on the attorney's recommendation. Thus, even though from a legal perspective the attorney only plays a role of an adviser, *de facto* he takes the final decision. Unlike the plaintiff, the attorney can be incentivized to be arbitrarily aggressive through a contract. So it is the lack of information that allows the plaintiff to practically strategically delegate the negotiation. The difference in the plaintiff's side payoff under complete and asymmetric information is depicted in Figure 8.

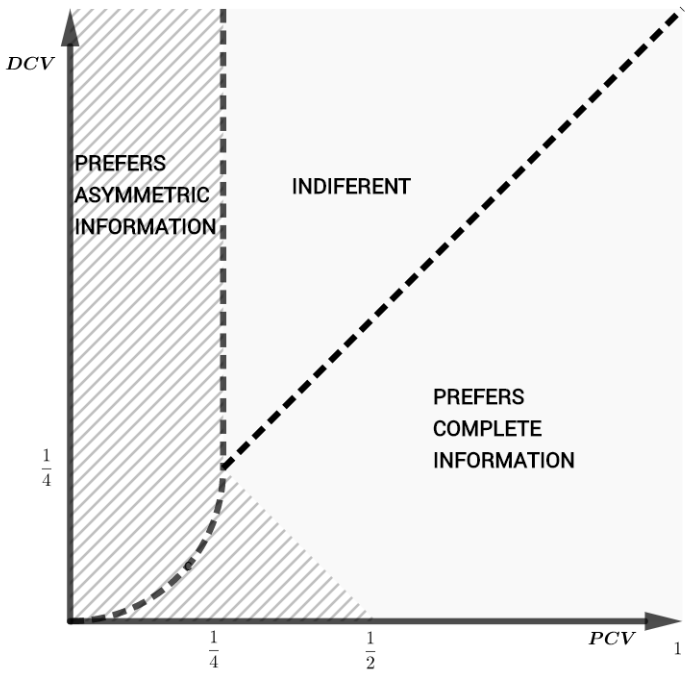
Corollary 1. *The payoff of the plaintiff's side is higher under asymmetric than under symmetric information, whenever:*

(i) $DCV > PCV$ *and* $PCV < \frac{1}{4}$ *or;*

(ii) $DCV \leq PCV$ *and* $DCV > (PCV + DCV)^2$

However, as the plaintiff's costs of trial grow, the inability to credibly to reject a high offer becomes a more serious problem for the plaintiff. The strategic misinformation replicates

Figure 8: Plaintiff's preferences over information structure



strategic delegation only for a small range of x and it becomes optimal to sign either case selling or pooling contracts. Alternatively, for high values of t^a, it may be the case that a change in the plaintiff's optimal contract is driven by an increase in the defendant's cost of trial, since obtaining information through the partially informative equilibrium is easier, and the case selling contract becomes a better option.

The pooling contract is optimal only if the costs of the trial for the defendant exceed the expected value of the judged compensation. In this case, the behavior of the defendant is not driven by the actual liability value, but rather by the threat of trial itself. It can happen, for example, if the trial costs include a major loss in reputation for the defendant, as in some cases of product liability.

It is worth noting that in my model the decision to drop the case is not driven by the plaintiff's side costs of trial (t^a). Since the case is always settled in the equilibrium the costs of trial are eventually never paid, and the bargaining power of the plaintiff's side also depends on the defendant's cost of trial (t^d). In other words, as long as the defendant's cost of trial are also high, the plaintiff should not be concerned with a negative expected value of the case. The plaintiff may be forced to drop the case only owing to high initial costs (c).

6 Conclusions

The paper has examined the strategic role of experts during the negotiations using pre-trial negotiations as an illustration. In my model, the plaintiff faces a harm of an unknown value, for which she has a right to be compensated by the defendant. In order to execute the liability, the plaintiff hires the attorney offering him a contract. Before the trial begins, parties try to reach a settlement through negotiation. The negotiation is modeled as a signaling game in which the defendant (who is aware of the liability value) makes a take-it-or-leave it offer to the plaintiff. Before taking the final decision the plaintiff consults her attorney.

In my model the incentives of the plaintiff and the attorney are endogenously set by a contract that specifies the division of the compensation and the costs of the litigation. It occurs that a strategic plaintiff would never propose a contract that leads to a complete information transmission.

The plaintiff may apply different strategies in order to improve her bargaining position. Firstly, when the trial costs are high, she might set a high share payment for the attorney, but transfer all the trial costs to him. The share payment ensures that the attorney's recommendation remains useful. Transferring the costs of the trial improves the bargaining position of the plaintiff. Secondly, when the trial costs are low, she may turn her lack of knowledge into an advantage through strategic misinformation. By strongly rewarding her attorney in case of trial, the plaintiff ensures a positive recommendation only if the settlement offer is sufficiently high. Since under the negative recommendation she remains uncertain about the liability value realization, she can credibly threaten the defendant with a trial; and hence she increases her bargaining position.

Strategic misinformation can be seen as an approach to replicate strategic delegation by the plaintiff in an environment where she cannot credibly transfer the right to take the settlement decision to the attorney. However, strategic misinformation functions only if the liability value realization is sufficiently low; since for very high offers the plaintiff cannot credibly use a trial threat despite the negative recommendation of the attorney. Interestingly, under strategic misinformation the plaintiff may be better off under asymmetric than under complete information.

Apart from identifying a new channel through which contracting can bring a strategic advantage during the negotiations, the model is able to help with understanding some phenomena present in the market for legal services. Firstly, it explains why the bifurcated fee contracts[26] are prevailing on the market – those are the only contracts that enable strategic misinformation. Secondly, since the result of negotiations depends not only on how costly is the trial is for the plaintiff, but also for the defendant, my model shows why the plaintiff may decide to litigate even if the case has a negative expected value.[27] Finally, it explains why the negotiations are usually handed to the attorneys even though the final decision on settlement is always made by the plaintiffs. Making the attorney an adviser through the negotiations allows the strategic use of the information structure.

The model leaves a space for future extensions. It predicts that the contracts signed by the parties will be based either on a completely flat, but contingent fee or a bifurcated but fixed fee. However in reality there is often a mixture of both, and contracts based on bifurcated and contingent fees are particularly popular.[28] It is left for future research to verify whether this result holds if the model accounts for risk aversion and the moral hazard problem. The model is also applicable in other environments: analyzing the consequences of strategic misinformation use in buyer-seller, or investment decision situations, is left for future research.

[26]Contracts that include an additional payment for the attorney in case of a trial.

[27]The case is said to have a negative expected value when the expected liability value does not cover the cost of a trial.

[28]Some empirical analysis of contracts on the market for legal services is provided e.g. by Helland and Tabarok (2003)

References

[1] Administrative Office of the US Courts. “Judical Business of the United States Courts” (2001-2016)

[2] Banks, Jeffrey S., and Sobel Joel. “Equilibrium Selection in Signaling Games.” Econometrica 55, no. 3 (1987): 647-61.

[3] Bebchuk, Lucian Arye. “Litigation and Settlement Under Imperfect Information.” The RAND Journal of Economics 15, no. 3 (1984): 404-15.

[4] Cabrales, Antonio, and Piero Gottardi. “Markets for information: Of inefficient firewalls and efficient monopolies.” Games and economic behavior 83 (2014): 24-44.

[5] Cho, In-Koo, and Kreps David M. “Signaling Games and Stable Equilibria.” The Quarterly Journal of Economics 102, no. 2 (1987): 179-221.

[6] Choi, Albert. “Allocating Settlement Authority under a Contingent-Fee Arrangement.” The Journal of Legal Studies 32.2 (2003): 585-610.

[7] Crawford, Vincent P., and Joel Sobel. “Strategic information transmission.” Econometrica: Journal of the Econometric Society (1982): 1431-1451.

[8] Dana, James D., and Spier Kathryn E.“Expertise and Contingent Fees: The Role of Asymmetric Information in Attorney Compensation.” Journal of Law, Economics, & Organization 9, no. 2 (1993): 349-67

[9] Danzon, Patricia Munch. “Contingent Fees for Personal Injury Litigation.” The Bell Journal of Economics 14, no. 1 (1983): 213-24.

[10] Daughety, Andrew F. and Jennifer F. Reinganum “Settlement negotiations with two-sided asymmetric information: Model duality, information distribution, and efficiency, International Review of Law and Economics” Volume 14, Issue 3 (1994): 283-298

[11] Emons, Winand “Expertise, contingent fees, and insufficient attorney effort”, International Review of Law and Economics, Volume 20, Issue 1 (2000): 21-331.

[12] Emons, Winand and N. Garoupa “US-style contingent fees and UK-style conditional fees: agency problems and the supply of legal services”. Manage. Decis. Econ., no. 27 (2006): 379–385.

[13] Farrell, Joseph, and Matthew Rabin. “Cheap talk.” The Journal of Economic Perspectives 10.3 (1996): 103-118.

[14] Fingleton, John, and Michael Raith. ”Career concerns of bargainers.” Journal of Law, Economics, and organization 21.1 (2005): 179-204.

[15] Fudenberg, Drew and Jean Tirole “Game Theory” Cambridge, MA: MIT Press; 1991.

[16] Fudenberg, Drew, and Jean Tirole. “Perfect Bayesian equilibrium and sequential equilibrium.” Journal of Economic Theory 53.2 (1991): 236-260.

[17] Hay, Bruce L. "Optimal contingent fees in a world of settlement." The Journal of Legal Studies 26.1 (1997): 259-278.

[18] Kamenica, Emir, and Matthew Gentzkow. "Bayesian persuasion." American Economic Review 101.6 (2011): 2590-2615.

[19] Kessler, Anke S. "The value of ignorance." The Rand Journal of Economics (1998): 339-354.

[20] Krishna, Vijay, and John Morgan. "A model of expertise." The Quarterly Journal of Economics 116.2 (2001): 747-775.

[21] rishna, Vijay, and John Morgan. "Contracting for information under imperfect commitment." The RAND Journal of Economics 39.4 (2008): 905-925.

[22] Reinganum, Jennifer F., and Wilde Louis L. "Settlement, Litigation, and the Allocation of Litigation Costs." The RAND Journal of Economics 17, no. 4 (1986): 557-66.

[23] Rickman, Neil. "Contingent fees and litigation settlement." International Review of Law and Economics 19.3 (1999): 295-317.

[24] Roesler, Anne-Katrin, and Balázs Szentes. "Buyer-optimal learning and monopoly pricing." American Economic Review 107.7 (2017): 2072-80. APA

[25] Schelling, Thomas C. "An essay on bargaining." The American Economic Review 46.3 (1956): 281-306.

[26] Schelling, Thomas C. "The strategy of conflict." Cambridge, Mass (1960).

[27] Spier, Kathryn E., "Litigation" in: Handbook of Law and Economics vol. 1, North-Holland (2001): 262-332.

[28] Moreno de Barreda, Ines, "Cheap Talk with Two-Sided Private Information", working paper (2013).

[29] Nalebuff, Barry. "Credible pretrial negotiation." The RAND Journal of Economics (1987): 198-210.

[30] U.S. Department of Justice, Bureau of Justice Statistics. "Contract cases in Large Counties", 1996.

[31] Vickers, John. Delegation and the theory of the firm." Economic Journal" (1985), 95: 138-147.

A Existence proofs

A.1 Out-of-equilibrium beliefs

As mentioned in the body of the paper, I disregard babbling equilibria if communication is possible. To impose that condition and simplify the notation I focus on equilibrium in which the attorney makes a recommendation $r = 1$ if he prefers the settlement and $r = 0$ if he prefers trial.[29]

Refinement A.

$$s_n y > (s_n + s_t)x - t^a + f_t \;\Rightarrow\; r(x, y) = 1 \tag{37}$$

$$s_n y < (s_n + s_t)x - t^a + f_t \;\Rightarrow\; r(x, y) = 0 \tag{38}$$

Additionally, in this subsection, I propose a simple rule in which the plaintiff could form her beliefs out-of-equilibrium path. If this rule is followed the defendant preferred equilibrium are unique – however they exist also for other out-of-equilibrium beliefs.

Firstly, on an out-of-equilibrium path the plaintiff should realize that the attorney always makes the recommendation in accordance with his preferences, thus she can assesses a positive probability only for the liability values for which the plaintiff would be willing to make the observed recommendation (r) given the observed offer (y).

Secondly, I assume that the beliefs of the plaintiff follow the intuitive criterion (Cho and Kreps 1987). In other words, observing some unexpected offer, the plaintiff should believe that it would have never been made if there had existed a lower offer that would have been accepted, or the defendant would have been better off under the trial than under the settlement at the observed offer.

If the two conditions are satisfied and the plaintiff observes some out-of-equilibrium (y, r) then she assigns a positive probability only to the liability values that belong to the set $\mathbf{X}(\mathbf{y}, \mathbf{r})$ defined as follows:

$$\mathbf{X}(\mathbf{y}, \mathbf{r}) \equiv \{x \in [0, \overline{x}] \mid r(x, y) = r \text{ and } p\big(y', r(x, y')\big) = 0 \; \forall y' < y\} \tag{39}$$

Finally, I suppose that the plaintiff makes a use of the information that liability values are uniformly distributed and assigns an equal probability to each realization in $\mathbf{X}(\mathbf{y}, \mathbf{r})$.

This way of forming beliefs can be seen as a simple rule of thumb used by the plaintiff. She only needs to be capable of recognizing what is the best case and worst case scenario liability value and computing the average between these two scenarios.

The beliefs must also be specified for "impossible scenarios," i.e., $X(y, r) = \emptyset$. This situation happens either when the offer is unreasonably high or when the recommendation is positive despite the offer being extremely low. The choice of beliefs of the plaintiff in these cases does not influence the equilibrium path and is purely a matter of convention. I simply suppose that the plaintiff believes that the defendant is behaving as if the information is complete.

These conditions are summarized in refinement B.

[29] As in any cheap-talk game this convention can be reversed for all or some offers, as long as both agents agree on the meaning of the message.

Refinement B. *Suppose the plaintiff faces some out-of-equilibrium pair (y, r) then his beliefs are:*

$$F^p(x; y, r) \text{ s.t. } x \sim U\big(\mathbf{X}(\mathbf{y}, \mathbf{r})\big) \qquad \textit{if } \mathbf{X}(\mathbf{y}, \mathbf{r}) \neq \emptyset \tag{40}$$

$$F^p(x; y, r) \text{ s.t. } P[\min\{\frac{(1-s_n)y + f_t}{1 - s_n - s_t}; \overline{x}\}|y, r] = 1 \qquad \textit{if } \mathbf{X}(\mathbf{y}, \mathbf{r}) = \emptyset \tag{41}$$

Refinement B uniquely specifies the plaintiff's out-of-equilibrium believes for any strategy profile.[30]

A.2 Proposition 1

Proposition 1 is proved in claims 1 – 3.

Claim 1. *There is no profitable deviation for the defendant, given the strategies of the attorney and the plaintiff.*

First, observe that making an offer higher than a candidate equilibrium offer $y(x)$ cannot be a profitable deviation for the defendant. It would necessarily be accepted and would yield a lower payoff.

Second, observe that making a lower offer than a candidate equilibrium offer $y(x)$ cannot be a profitable deviation. Such an offer would necessarily be rejected, leading to a trial. Indeed if the defendant makes an offer $y' < y(x)$, then $r(y', x) = 0$ (since $\varsigma^a(C) = \varsigma^p(C)$) and $p(y, r) = 0$, leading to the payoff of $-x - t^d < -y(x)$ to the defendant.

Claim 2. *At any pair (x, y) there is no profitable deviation for the attorney, given the strategy of the plaintiff.*

The proof is a consequence of the fact that the plaintiff always follows the attorney's recommendation and the attorney makes a recommendation in accordance with his own preferences, thus there cannot be any profitable deviation for the defendant.
Suppose (y, x) is s.t. $r(y, x) = 1$, but the attorney deviates and recommends $r' = 0$. Then, if $y < \overline{x} - t^d$, $p(y, r') = 0$ and the payoff of the attorney is $s_n x + f_t + f_n - c - t^a \leq s_n y - c$. If, $y \geq \overline{x} - t^d$, $p(y, r) = 1$ and the payoff of the attorney is $s_n y - c = s_n y - c$.
Suppose (y, x) is s.t. $r(y, x) = 0$, but the attorney deviates $r' = 1$. Then $p(y, r') = 1$ and the payoff of the attorney is $s_n y - c \leq s_n x + f_t + f_n - c - t^a$.
The plaintiff, following the Bayes' rule and refinement B, must have the following beliefs:

(i) Suppose the plaintiff observes some $(y \leq \overline{x} - \varsigma^p(C), r = 1)$. Then, using the Bayes' rule $P(x = y - \varsigma^p(C)|y, r] = 1$.

(ii) Suppose the plaintiff observes some $(y > \overline{x} - \varsigma^p(C), r = 1)$ then using refinement B the offer falls into "impossible scenario case" $\mathbf{X}(y, r) = \emptyset$ and $\mathbb{E}^p[x|y, r] \leq \overline{x} - \varsigma^p(C)$.

[30] With the exception of out-of-equilibrium beliefs for (y, r) s.t. $X(y, r) = \emptyset$ and $(1-s_n)y + f_t = (1-s_n-s_t) = 0$ where term (6) is not well defined. However, since this situation is based on the plaintiff being indifferent between any two offers, and the undefined beliefs are associated with "impossible scenarios" the choice of believes is irrelevant.

(iii) Suppose the plaintiff observes some $(y < \overline{x} - \varsigma^p(C), r = 0)$ then using refinement B it is enough for the plaintiff to realize that for the attorney to make a negative recommendation $x = y - \varsigma^p(C)$ in the best case scenario. So $F_p(x|y,r) = U([y - \varsigma^p(C); \overline{x}])$ and the expectations of the plaintiff $\mathbb{E}^p[x|y,r] > y - \varsigma^p(C)$.

(iv) Suppose the plaintiff observes $(y = \overline{x} - \varsigma^p(C), r = 0)$, then the offer again falls into "impossible scenario" $\mathbf{X}(y,x) = \emptyset$ and using refinement B $\mathbb{E}^p[x|y,r] = y - \varsigma^p(C)$.

Claim 3. *At any pair (x, y) there is no profitable deviation for the plaintiff, given her beliefs.*

It is always the best response of the plaintiff to accept the offer if she believes it at least compensates her payoff under the trial:

$$p^{BR}(y,r) = \begin{cases} 1 & \text{if } \mathbb{E}^p[x|y,r] \leq y - \varsigma^p(C) \\ 0 & \text{if } \mathbb{E}^p[x|y,r] > y - \varsigma^p(C) \end{cases} \tag{42}$$

Now, by substituting for $\mathbb{E}^p[x|y,r]$ from the beliefs of the plaintiff derived above:

$$p^{BR}(y,r) = \begin{cases} 1 & \text{if } y \geq \overline{x} - \varsigma^p(C) \\ r & \text{if } y < \overline{x} - \varsigma^p(C) \end{cases} \tag{43}$$

Thus, $p(y,r) = p^{BR}(y,r)$.

A.3 Proposition 2

Proposition 2 is proved using claims 4 – 6.

Claim 4. *There is no profitable deviation for the defendant, given the strategies of the attorney and the plaintiff*

Note that making any offer greater than a candidate equilibrium offer cannot be a profitable deviation – such an offer would always be accepted and would thus yield a lower payoff.

(i) If $y' < \dot{y}$ $r(x, y') = 1$, thus $p(y', r) = 1$ and the defendant's payoff is $-y' < -y(x)$;

(ii) If $y' \geq \dot{y}$, $p(y', r) = 1$ despite the recommendation and the defendant's payoff is $-y' < -y(x)$

Now, observe that also making any offer lower than a candidate equilibrium offer is not a profitable deviation. It would always be rejected, yielding a (weakly) smaller trial payoff. Suppose the defendant indeed makes some deviation $y' < y(x)$.
Firstly, observe that then $y' < \dot{y}$.
Since $y' < y(x)$ $r(x, y') = 0$ and since $y' < \dot{y}$ $p(y', r) = 0$ thus the payoff of the defendant is: $-x - t^d \geq -y(x)$.

Claim 5. *At any (x, y) there is no profitable deviation for the attorney, given the strategy of the plaintiff.*

Analogously, as in the proof of Proposition 1, proof is a direct consequence of the fact that the attorney always makes a recommendation in accordance with his own preferences. If the plaintiff follows the recommendation, there clearly cannot be a profitable deviation for the attorney. However, for offers $y \geq \dot{y}$, the attorney's recommendation is actually ignored. Yet, still there cannot be any profitable deviation for the defendant, since his recommendation is simply irrelevant.

Claim 6. *At any (y, r) there is no profitable deviation for the plaintiff given her beliefs.*

It is always the best response of the plaintiff to accept the offer if she believes it at least compensates her payoff under the trial:

$$p^{BR}(y, r) = \begin{cases} 1 & \text{if } \mathbb{E}^p[x|y, r] \leq y - \varsigma^p(C) \\ 0 & \text{if } \mathbb{E}^p[x|y, r] > y - \varsigma^p(C) \end{cases} \tag{44}$$

Now I analyze the beliefs of the plaintiff for any (y, r).

(i) Suppose the plaintiff observes some $(y > doty, r = 0)$. This case is falls into "impossible scenario" category i.e $\mathbf{X}(y, r) = \emptyset$ and so $\mathbb{E}^p[x|y, r] \leq y - \varsigma^p(C)$.

(ii) Suppose the plaintiff observes $(y = \dot{y}, r = 0)$. Then, using the Bayes' rule the plaintiff recognizes that the offer is made for all liability values $x \in (\dot{y} + \varsigma^a(C); \overline{x}]$ and $\mathbb{E}^p[x|y, r] = y - \varsigma^p(C)$.

(iii) Suppose the plaintiff observes $(y = \dot{y}, r = 1)$. Then, using the Bayes' rule the plaintiff correctly recognizes that there is only one liability value $\dot{y} - \varsigma^a(C)$ for which such an offer and such a recommendation could be made. Thus, $\mathbb{E}^p[x|y, r] < y - \varsigma^p(C)$.

(iv) Suppose the plaintiff observes $(y < \dot{y}, r = 1)$. Then, using the Bayes' rule he correctly recognizes that the offer is made by a type $y + \varsigma^a(C)$. $\mathbb{E}^p[x|y, r] < y - \varsigma^p(C)$.[31]

(v) Suppose the plaintiff observes $(y < \overline{y}, r = 0)$. Then, by refinement B, the plaintiff must suppose that in the best case scenario $x = y + \varsigma^a(C)$ and in the worst case scenario $x = \overline{x}$. Now, since $y < \dot{y}$, $\mathbb{E}^p[x|y, r] > y - \varsigma^p(C)$.

Substituting the beliefs of the plaintiff into p^{BR} it occurs that $p(y, r) = p^{BR}(y, r)$.

A.4 Proposition 4

Proposition 4 is proved in claims 7 – 9.

Claim 7. *There is no profitable deviation for the defendant given the strategy of the plaintiff and the attorney.*

[31] Note that if the offer is so low that the attorney should never have recommended it, yet the plaintiff observes a positive recommendation by refinement B $\mathbb{E}^p[x|y, r] = y - \varsigma^p(C)$. Also, if the offer is 0 it may be the case that using Bayes' rule the plaintiff cannot exactly determine the type of the defendant, yet the $\mathbb{E}^p[x|y, r] < y - \varsigma^p(C)$ still holds.

Firstly, observe that the defendant cannot benefit from increasing its offer. If the higher offer happens to be accepted, his payoff will be lower than under candidate equilibrium offer $y(x)$. If the offer is rejected, the defendant also obtains a trial payoff, which is also (weakly) smaller than a settlement payoff under a candidate equilibrium offer. Suppose the defendant indeed makes some deviation $y' > y(x)$.

(i) If $y' \in \mathbf{Y}^*$ then $r(y', x) = 1$ and $p(y', r) = 1$, thus the payoff of the defendant is $-y' < -y(x)$;

(ii) If $y' > y_K$ despite the attorney's recommendation $p(y', r) = 1$ thus the payoff of the defendant is $-y' < -y(x)$;

(iii) If $y' \notin \mathbf{Y}^*$ and $y' < y_K$ despite the attorney's recommendation $p(y', r) = 0$ and the payoff of the defendant is $-x - t^d \leq -y(x)$;

Also, making a lower offer cannot benefit the defendant, since it would necessarily lead to a trial. Either because of a negative recommendation of the attorney or because the offer is not an element of a standard offer sequence.

Suppose the defendant indeed makes some deviation $y' < y(x)$.

(i) If $y' \notin \mathbf{Y}^*$ then despite the recommendation of the attorney $p(y', r) = 0$. And the payoff of the defendant is $-x - t^d \leq -y(x)$;

(ii) If $y \in \mathbf{Y}^*$ then $r(y, x) = 0$ and $p(y', r) = 0$. Thus the payoff of the defendant is $-x - t^d < y(x)$.

(iii) By construction of the pooling offer sequence it cannot be the case that: $y' < y(x)$, $y \in \mathbf{Y}^*$, and $r(x, y) = 1$.

Claim 8. *At any (x, y) there is no profitable deviation for the attorney given the strategy of the plaintiff.*

Analogously to the proof of Proposition 2, the attorney cannot have a profitable deviation, since the plaintiff either follows or ignores his recommendation.

Claim 9. *At any (y, r) there is no profitable deviation for the plaintiff given her beliefs.*

The proof is analogous as in Proposition 2. It is always the rest Response of the plaintiff to accept the offer if she believes it at least compensates her payoff under the trial:

$$p^{BR}(y, r) = \begin{cases} 1 & \text{if } \mathbb{E}^p[x|y, r] \leq y - \varsigma^p(C) \\ 0 & \text{if } \mathbb{E}^p[x|y, r] > y - \varsigma^p(C) \end{cases} \tag{45}$$

Now I analyze the beliefs of the plaintiff for any (y, r).

(i) Suppose the plaintiff observes $(y > y_K, r)$, then using refinement B, this is an example of an "impossible scenario" $\mathbf{X}(y, r) = \emptyset$ and $\mathbb{E}^p[x|y, r] \leq y - \varsigma^p(C)$.

(ii) Suppose the plaintiff observes, $(y \in \mathbf{Y}^*, r = 1)$, then using the Bayes' rule the plaintiff correctly identifies that $x \in (x_k; x_{k+1}]$, [32] and thus $\mathbb{E}^p[x|y, r] \leq y - \varsigma^p(C)$.

[32] Or $x \in [0, x_0)$

(iii) Suppose the plaintiff observes $(y < y_K, r = 0)$, then using the refinement B, just from the fact that recommendation is negative the plaintiff must realize that $x > y + \varsigma^p(C)$, and so $\mathbb{E}^p[x|y, r] > y - \varsigma^p(C)$.

(iv) Suppose the plaintiff observes ($y \notin \mathbf{Y}^*$ and $y < y_K, r = 1$), then using the refinement B, she should suppose at best the liability value is just above the one for which the defendant could make a lower standard offer x_l where $l = \max\{k|y_k \in \mathbf{Y}^* \text{ and } y_k < y'\}$.[33] In the worst case scenario $x = y' + \varsigma^a(C)$. Thus: $\mathbb{E}^p[x|y, r] > y - \varsigma^p(C)$

So substituting the plaintiff beliefs into the expression for p^{BR} it can be concluded that $p(x, y) = p^{BR}(x, y)$.

A.5 Propositions 3 and 5

Propositions 3 and 5 are proved in claims 10 – 12.

Claim 10. *There is no profitable deviation for the defendant given the strategies of the plaintiff and the attorney.*

Suppose the defendant makes a deviation $y' > y(x)$.

(i) If $y' \geq \dot{y}$ then, despite the recommendation of the attorney, $p(y', r) = 1$ and the payoff of the defendant is $-y' < -x - t^d$ if $x < \overline{y} - t^d$ and $-y' < -\dot{y}$ otherwise.

(ii) If $y' < \dot{y}$, despite the recommendation of the attorney, $p(y', r) = 0$ and the payoff of the defendant is $-x - t^d = -x - t^d$

Suppose the defendant makes some deviation $y' < y(x)$. Then, the decision of the plaintiff despite of her attorney's recommendation is $p(y, x) = 0$ and the payoff of the defendant is $-x - t^d \leq -\dot{y}$.

Claim 11. *At any (x, y) there is no profitable deviation for the attorney given the strategy of the plaintiff.*

Since the attorney's recommendation is always ignored, he cannot have a profitable deviation from any strategy.

Claim 12. *At an (y, r) there is no profitable deviation for the plaintiff, given her beliefs*

Any strategy of the plaintiff that satisfies the following conditions is her best response:

(a) $\mathbb{E}^p[x|y, r] > y - \varsigma^p(C) \Rightarrow p = 0$

(b) $\mathbb{E}^p[x|y, r] < y - \varsigma^p(C) \Rightarrow p = 1$

Now I analyze the plaintiff's beliefs under each possible pair (y, r)

[33] If this set is empty $l = 0$.

(i) Suppose the plaintiff observes some $(y > \dot{y}, r)$, then by refinement B $\mathbb{E}^p[x|y, r] \leq y - \varsigma^p(C)$.

(ii) Suppose the plaintiff observes some $(y = \dot{y}, r = 0)$ then using by the Bayes' rule $\mathbb{E}^p[x|y, r] = y - \varsigma^p(C)$.

(iii) Suppose the plaintiff observes some $(y \in (0, \dot{y}), r = 0)$ then by refinement B $\mathbb{E}^p[x|y, r] > y - \varsigma^p(C)$.

(iv) Suppose the plaintiff observes $(y = 0, r = 0)$[34] then by the Bayes' rule $\mathbb{E}^p[x|y, r] > \varsigma^p(C)$.

(v) Suppose the plaintiff observes $(y \leq \dot{y}, r = 1)$ then by refinement B $\mathbb{E}^p[x|y, r] = x - \varsigma^p(C)$.

Thus $p(y, r)$ satisfies (a) and (b).

B Negotiations phase under contracts with trial premium in the form of a share

As mentioned in section 3.3, if $s_t > 0$ the willingness to settle is no longer constant over the liability value for both the attorney and the plaintiff.

$$\varsigma^p(x; C) = \frac{f_t + s_t x}{1 - s_n} \text{ if } f_t + s_t x \neq 0 \text{ or } 1 - s_n \neq 0 \tag{46}$$

$$\tag{47}$$

And can take any value otherwise.

$$\varsigma^a(x; C) = \frac{t_a - f_t - s_t x}{s_n} \text{ if } t^a - f_t - s_t x \neq 0 \text{ or } s_n \neq 0 \tag{48}$$

$$\tag{49}$$

And can take any value otherwise.

Consequently $\Phi(x; C)$ is no longer constant but decreases with x. So if $s_t > 0$ the equilibrium may contain up to four regions that exhibit the properties of different equilibria types, described in section 3.2. Firstly, for low liability values $\Phi(x; C) << 0$ and the equilibrium is uninformative (due to an aggressive plaintiff). As $\Phi(x; C)$ increases with the liability value, even though it is still negative, the equilibrium becomes partially informative. As the liability value increases even further $\Phi(x; C)$ becomes positive, yielding misinformative equilibrium. Finally, for very high values of liability $\Phi(x; C)$ reaches the level under which the equilibrium becomes uninformative again. This regions are separated by three thresholds.

[34] The equilibrium is not supposed to be completely pooling, otherwise the point (iii) would apply.

If indeed the equilibrium exhibits features of all the equilibria types mentioned in section 3.2.,[35] the liability value at which the attorney and defendant's willingness to settle intersect ($\varsigma^a(\breve{x}; C) = t^d$) generates the upper threshold $\breve{x}$:

$$\breve{x} = \frac{(1 - s_n)t^d + t^a - f_t}{s_t} \tag{50}$$

The intersection of the attorney and the plaintiff's willingness to settle ($\varsigma^a(\tilde{x}; C) = \varsigma^p(\tilde{x}; C)$) generates the middle threshold $\tilde{x}$:

$$\tilde{x} = \frac{(1 - s_n)t^a - f_t}{s_t} \tag{51}$$

To find the lowest threshold, a new object called *the pooling offer function* $\rho(x; C)$ must be defined. The function is linked to the way the plaintiff forms her beliefs. It answers a question – what is a minimal offer that would be acceptable for the plaintiff if she knew that the liability value was in between x and the liability at which the attorney would change his recommendation give an offer y.

Formally, the function $\rho(x; C)$ is the solution for the following minimization problem:

$$\begin{aligned} &\min y \\ &\text{s.t.} \\ &y \geq x^e - \varsigma^p(x^e) \\ &x^e = \frac{1}{2}(x + \frac{s_n y + t^a - f_t}{s_t + s_n}) \end{aligned} \tag{52}$$

And the exact solution is given by:

$$\begin{aligned} \rho(x; C) = &\frac{(s_n + s_t)(1 - s_n) - (s_n + s_t)s_t}{(s_n + s_t)(1 - s_n) + s_t} x + \\ &\frac{1 - s_n - s_t}{(s_n + s_t)(1 - s_n) + s_t} t^a - \frac{1 + s_n + s_t}{(s_n + s_t)(1 - s_n) + s_t} f_t \end{aligned} \tag{53}$$

The lowest threshold $\hat{x}$ is given by the intersection of the defendant's willingness to settle and the pooling offer function ($\rho(\hat{x}; C) = \hat{x} + t^d$):

$$\hat{x} = \frac{1 - s_n - s_t}{(1 + s_n + s_t)s_t} t^a - \frac{(1 - s_n)(s_n + s_t) + s_t}{(1 + s_n + s_t)s_t} t^d - \frac{f_t}{s_t} \tag{54}$$

For all the liability values below $\hat{x}$ the equilibrium is *uniformative* – since the attorney is recommending settlement for such a wide range of liability values that the defendant is not even capable of pooling around some offer acceptable by the plaintiff.

If the liability value lies in between $\hat{x}$ and $\tilde{x}$ the equilibrium is *partially informative* – even though the attorney is still more willing to settle than the plaintiff, he provides the defendant with at least a possibility to convince the plaintiff to settle.

[35] It does not have to be the case, the thresholds can take values below 0 and above $\overline{x}$, then properties of some equilibrium type are not exhibited

For liability values in-between $\tilde{x}$ and $\breve{x}$ the equilibrium is *misinformative*. The attorney is more willing to go to trial than the plaintiff, but the defendant may still be willing to make an offer high enough to ensure a positive recommendation.

Finally, if the liability value lies above $\breve{x}$ the equilibrium is *uninformative* - attorney's preference for resolving the case by trial is so strong that the defendant is no longer willing to convince the attorney.

Compared to the scenario described in section 3.2.3 the y_k and x_k sequences derivations change, since they must now take into account that plaintiff and attorney's incentives are becoming more and more aligned as the liability value increases.

Particularities of each standard offer cannot be described in terms of congruence coefficient at a liability value ($\Phi(x; C)$), since the liability value is not observed by the plaintiff. Instead, they can be expressed by the congruence coefficient of their incentives at a given offer y ($\phi(y, C)$). It measures the alignment of the incentives as a difference between the liability value at which the plaintiff and the defendant would be willing to accept the given settlement offer y.

$$\phi(y; C) \equiv \frac{s_t y + f_t - (1 - s_n - s_t)t^a}{(1 - s_n - s_t)(s_n + s_t)} \tag{55}$$

The lowest and highest liability value realizations for which the defendant makes the same standard offer are described by each two consecutive terms of a sequence x_k.

$$x_0 = \begin{cases} \breve{x} & \text{if } \rho(\breve{x}) \geq 0 \\ \frac{f_t - t^a}{s_n + s_t} & \text{if } \rho(\breve{x}) < 0 \end{cases} \tag{56}$$

$$x_{k+1} = x_k + 2\phi\big(\rho(x_k)\big) \tag{57}$$

Each standardized offer is such that it compensates the plaintiff's expected payoff under the trial:

$$y_k = \frac{1}{2}(x_k + x_{k-1}) - \varsigma^p\big(\frac{1}{2}(x_k + x_{k-1}); C\big) \tag{58}$$

Additionally, analogously to section 3.2.3, I define the x_K being the smallest element of the sequence s.t $x_{K+1} \geq \overline{x}$. Note that x_K does not have to be well defined, when $K \to \infty$. [36]

Finally, the minimal unrejectable offer, i.e., the offer the plaintiff is willing to accept ignoring the recommendation of the plaintiff, must be found. Since the equilibrium may exhibit properties of all the equilibrium types described in section 3.2 the minimal unrejectable offer under each possible scenario must be found:$\dot{y}^M$ for misinformative; $\dot{y}^U$ for uninformative; and y_K for partially informative.

[36]It happens if $\tilde{x} < \overline{x}$ i.e., for high values of x the equilibrium behaves in an uninformative or partially informative manner. Then the difference between the consecutive elements of pooling step and standard offer sequences are getting smaller and smaller, tending to 0, so that the type $\tilde{x}$ can be seen as constituting a separate group x_K.

$\dot{y}^M$ must be an element of the solution to the following system of equations:

$$\dot{y}^M = \frac{(\dot{x}+\overline{x})}{2} - \varsigma^p\Big(\frac{(\dot{x}^M+\overline{x})}{2};C\Big) \tag{59}$$
$$\dot{y}^M = \dot{x}^M - \varsigma^a(\dot{x};C) \tag{60}$$

Where the first equation ensures that the plaintiff is exactly compensated for his payoff under trial; and the second equation ensures that the cut-off type ($\dot{x}$) is indifferent between making an offer that would be recommended by the attorney and making a minimal unrejectable offer. Which leads to an explicit formula for $\dot{y}^M$:

$$\dot{y}^M = \frac{(1-s_n-s_t)\big((s_n+s_t)(\overline{x}-\frac{f_t}{1-s_n-s_t})-(f_t-t^a)\big)}{(1-s_n)(s_n+s_t)+s_t} \tag{61}$$

Analogously $\dot{y}^U$ must be an element of the solution to the following system of equations:

$$\dot{y}^U = \frac{(\dot{x}+\overline{x})}{2} - \varsigma^p\Big(\frac{(\dot{x}^U+\overline{x})}{2};C\Big) \tag{62}$$
$$\dot{y}^U = \dot{x}^U + t^d \tag{63}$$

Where the first equation ensures that the plaintiff is exactly compensated for his payoff under the trial; and the second equation ensures that the cut-off type ($\dot{x}$) is indifferent between the trial and accepting the minimal unrejectable offer.

$$\dot{y}^U = \frac{(1-s_n-s_t)\overline{x}-t^d-2f_t}{1-s_n+s_t} \tag{64}$$

Finally, y_K behaves analogously as in the case described in section 3.

$$y_K = \frac{1}{2}(x_K+\overline{x}) - \varsigma^p\big(\frac{1}{2}(x_K+\overline{x});C\big) \tag{65}$$

While computing $\dot{y}$ the possibility of completely pooling equilibrium (with 0 or with a positive offer) must be taken into account.

$$\dot{y} = \max\{0;\frac{1}{2}\overline{x}-\varsigma^p(\frac{1}{2}\overline{x};C);\dot{y}^M;\dot{y}^U;y_K\} \tag{66}$$

Additionally, I define $\underline{y}$ which is the smallest offer the plaintiff would ever be willing to accept.

$$\underline{y} = \begin{cases} y_0 & \text{if } \tilde{x} > 0 \\ 0 & \text{if } \tilde{x} \leq 0 \end{cases} \tag{67}$$

Importantly, PBE of the negotiations phase with a positive s_t, follow the properties of the described equilibria, in terms of the expected payoff. That is, for $x < \check{x}$ the case is resolved by trial for low liability values and for high liability values is settled, compensating on average the plaintiff's payoff under trial. For $x \in (\check{x}, \tilde{x})$ the case is always settled and the plaintiff is compensated for her payoff under the trial on average. For $x \in (\tilde{x}, \hat{x})$ the case is settled compensating either the attorney (low x) or the plaintiff's (high x) payoff under the trial. Finally, if $x > \hat{x}$ the case again can be resolved by trial (low x) or settled compensating on average the plaintiff's payoff under the trial (high x).

For simplicity, the set of offers that are made by the defendant in the equilibrium is denoted by $\mathbf{Y}^*$. The proposition does not describe equilibrium behavior on the thresholds, since they are of measure 0 and do not influence the expected payoff.[37]

Proposition 7. *For any contract C s.t. $s_t > 0$ there exists a PBE in which:*

(i) The defendant's offer is $\min\{y(x), \dot{y}\}$ where $y(x)$ is s.t.

(a) For $x \in (\check{x}, \tilde{x})$

$$y(x) = \begin{cases} 0 & \text{if } x < x_0 \\ y_k & \text{if } x \in (x_{k-1}; x_k) \end{cases} \tag{68}$$

(b) For $x \in (\tilde{x}, \hat{x})$

$$y(x) = x - \varsigma^a(x; C) \tag{69}$$

(c) For $x < \check{x}$ or $x > \hat{x}$

$$y(x) = \begin{cases} \overline{y} & \text{if } x \geq \dot{y} - t^d \\ 0 & \text{if } x < \dot{y} - t^d \end{cases} \tag{70}$$

(ii) The attorney's recommendation is:

$$r(x, y) = r^a(x, y) \tag{71}$$

(iii) The plaintiff's decision is:

$$p(y, r) = \begin{cases} 1 & \text{if } y \geq \overline{y} \\ r & \text{if } y \in \mathbf{Y}^* \text{ and } y \geq \underline{y} \text{ and } y < \dot{y} \\ 0 & \text{otherwise} \end{cases} \tag{72}$$

The proof is analogous to the proofs of Propositions 2 – 5 and is stated in claims 13 to 15.

Claim 13. *There is no profitable deviation for the defendant given the strategies of the plaintiff and the attorney*

Firstly, observe that any deviation $y' > y(x)$ cannot be a profitable deviation for the attorney. If $p(y', r) = 0$ the payoff of the attorney is: $-x - t^d \leq y(x)$. If $p(y', r) = 1$ the payoff of the attorney is $-y' \leq -y(x)$.
Secondly, observe that for any deviation $y' < y(x)$ necessarily implies $p(y', r) = 0$ leading to a payoff $-x - t^d \leq -y(x)$.

[37] The actual behavior on the thresholds can be determined, and depends on the relation of each of the thresholds with 0 and $\overline{x}$.

Claim 14. *At any (x, y) there is no profitable deviation for the attorney given the strategy of the plaintiff*

Analogously to Proposition 1, the proof is a consequence of the attorney giving an advice only in accordance with his own preferences. Since the plaintiff either follows or ignores the recommendation of the attorney, there cannot be a profitable deviation for the attorney.

Claim 15. *At any (y, r) there is no profitable deviation for the plaintiff given that her beliefs follow the Bayes' rule on the equilibrium path and refinement B out of the equilibrium path.*

Note that any strategy of the plaintiff satisfying the following conditions must be her best response:

(A) $\mathbb{E}^p[x|y,r] > y - \varsigma^p(\mathbb{E}[x^p|y,r];C) \;\Rightarrow\; p(y,r) = 0$

(B) $\mathbb{E}^p[x|y,r] < y - \varsigma^p(\mathbb{E}[x|y,r];C) \;\Rightarrow\; p(y,r) = 1$

Now, I analyze what the beliefs of the plaintiff are at any (y, r), given that they follow the Bayes' rule on and the refinement B out of the equilibrium.

(i) Suppose the plaintiff observes some $(y > \dot{y}, r)$, then using refinement B $\mathbb{E}^p[x|y,r] \leq y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$.

(ii) Suppose the plaintiff observes $(\dot{y}, r = 0)$, then $\mathbb{E}^p[x|y,r] = y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$

(a) By Bayes' rule if $\dot{x} \geq \tilde{x}$.

(b) By refinement B if $\dot{x} < \tilde{x}$

(iii) Suppose the plaintiff observes $(\dot{y}, r = 1)$, then:

(a) If $\dot{x} \in [\check{x}; \tilde{x}]$ $\mathbb{E}^p[x|y,r] = y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$ by the Bayes' rule;

(b) If $\dot{x} \in (\tilde{x}, \hat{x}]$ $\mathbb{E}^p[x|y,r] \leq y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$ by the Bayes' rule;

(c) If $\dot{x} < \check{x}$ $\mathbb{E}^p[x|y,r] = y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$ by the Bayes' rule;

(d) If $\dot{x} > \hat{x}$ $\mathbb{E}^p[x|y,r] = y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$ by refinement B.

(iv) Suppose the plaintiff observes some $\big(y \in [\tilde{x} - \varsigma^a(\tilde{x};C); \hat{x} - \varsigma(\hat{x};C]; r = 1\big)$ and $y < \dot{y}$, then by the Bayes' rule $\mathbb{E}^p[x|y,r] < y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$;

(v) Suppose the plaintiff observes some $\big(y \in [\tilde{x} - \varsigma^a(\tilde{x};C); \hat{x} - \varsigma(\hat{x};C]; r = 0\big)$ and $y < \dot{y}$, then by refinement B $\mathbb{E}^p[x|y,r] \geq y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$.

(vi) Suppose the plaintiff observes some $\big(y \in [\underline{y}; \tilde{x} - \varsigma^a(\tilde{x};C)); r = 1\big)$ and $y \in \mathbf{Y}^*$, then by the Bayes' rule $\mathbb{E}^p[x|y,r] = y - \varsigma^p(\mathbb{E}[x|y,r];C)$

(vii) Suppose the plaintiff observes some $\big(y \in [\underline{y}; \tilde{x} - \varsigma^a(\tilde{x};C)); r = 0\big)$ and $y \in \mathbf{Y}^*$, then by refinement B $\mathbb{E}^p[x|y,r] > y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$

(vii) Suppose the plaintiff observes some $\big(y \in [\underline{y}; \tilde{x} - \varsigma^a(\tilde{x};C)); r = 0\big)$ and $y \in \mathbf{Y}^*$, then by refinement B $\mathbb{E}^p[x|y,r] > y - \varsigma^p(\mathbb{E}^p[x|y,r];C)$

(viii) Suppose the plaintiff observes some $\big(y \in [\underline{y}; \tilde{x} - \varsigma^a(\tilde{x}; C)); r\big)$ and $y \neq \mathbf{Y}^*$, then by refinement B $\mathbb{E}^p[x|y,r] > y - \varsigma^p(\mathbb{E}^p[x|y,r]; C)$

(ix) Suppose the plaintiff observe some $(y < \underline{y}, r)$, then $\mathbb{E}^p[x|y,r] > y - \varsigma^p(\mathbb{E}^p[x|y,r]; C)$

(a) If $\check{x} > 0$ by the Bayes' rule;

(a) If $\check{x} = 0$ by refinement B.

Substituting for the beliefs of the plaintiff in each case it can be concluded that $p(y,r)$ satisfies (A) and (B).

C Defendant preferred equilibria

In this section I show that selected equilibria are indeed defendant's preferred.

For sake of keeping the proofs concise I ignore the restriction on the non-negativity of the offer, as well as the possibility of the equilibria being completely pooling – all the proofs visibly extend for this possibility, and formal explanation is available upon request.

In case of equilibria with positive s_t I study only the most complex case of the equilibrium exhibiting features of all the equlbria types – all the other proofs can be obtained by eliminating some steps form the proof.

Proposition 8. *If $\Phi(C) < 0$ and $\Phi(C) + \varsigma^p(C) \geq -t^d$, then partially informative equilibrium is defendant's preferred equilibrium.*

Proof. Firstly, I show that partially informative equilibrium is defendant's preferred among the equilibria that do not lead to trial.

There cannot exist a trial-free equilibrium in which the plaintiff does not recover her payoff under the trial on average; that is the expected transfer form the defendant to the plaintiff's side must be higher or equal than $\frac{1}{2}\overline{x} - \varsigma^P(C)$. Observe that, the average transfer from the defendant to the plaintiff's side under partially informative equilibrium is equal to the lower bound on the transfer.

Secondly, for any liability value x the defendant is (weakly) better off under the settlement than under the trial. Thus partially informative equilibrium is defendant's preferred. □

Proposition 9. *If $\Phi(C) = 0$, then perfectly informative equilibrium is defendant's preferred equilibrium.*

The proof of proposition 9 follows exactly the proof of proposition 8, as perfectly informative equilibrium is a limit of partially informative equilibrium when the difference between consecutive terms of the pooling offer sequence converge to 0, and thus is omitted.

Proposition 10. *If $\Phi(C) > 0$ and $\varsigma^a(C) \geq -t^d$ misinformative equilibrium is defendant's preferred.*

Proof. Firstly, I show that misinformative equilibrium is defendant's preferred among the equilibria that do not lead to trial.

To prove the statement above I define the concept of meaningfulness of a recommendation. A recommendation is called meaningful at an offer y if and only if $p(y,1) \neq p(y,0)$ and is called meaningless otherwise. I suppose, without loss of generality, that a recommendation "1" is always interpreted as "accept" and a recommendation "0" is always interpreted as "reject"; that is, at any y for which the recommendation is meaningful $p(y, 0) = 0$ and $p(y, 1) = 1$.

Observe that if the recommendation is meaningful then $r(x, y) = 1 \Rightarrow\ y \geq x - \varsigma^a(C)$ and $r(x, y) = 0 \Leftarrow y < x - \varsigma^a(C)$.

Note that if the equilibrium is supposed to be trial-free the defendant makes offers at which the recommendation is meaningful only if the liability value is s.t. the recommendation will be 1, and makes only one offer at which the recommendation is meaningless. Particularly, the smallest offer which the plaintiff accepts despite the negative recommendation.

Denote by y^* the smallest offer which the plaintiff accepts despite the negative recommendation in some trial-free equilibrium. Observe that this offer would be made for all the liability values s.t. $x - \varsigma^a(C) \geq y^*$. Denote the smallest liability value at which the offer y^* is made in this equilibrium by $x^* \equiv y^* + \varsigma^a$. Then, by assumption that y^* is accepted by the plaintiff in equilibrium, it must be that it at least covers her expected payoff under the trial, thus $y^* = \frac{1}{2}(x^* + \bar{x} - \varsigma^p(C)$. After verifying the conditions on $\dot{y}$ and $\dot{x}$ it occurs that the $y^* = \dot{y}$ and $x^* = \dot{x}$ and so in a misinformative equilibrium the offer that is accepted by the plaintiff despite the negative recommendation of the attorney is the smallest among all trial-free equilibria and is made for the widest range of liability values among all trial-free equilibria.

Now, observe also that the offers at which the recommendation is meaningful are made for such a liability values that the condition y $\geq x - \varsigma^a(C)$ is always binding.[38]

Combining these two observations, implies that in the misinformative equilibrium, for any liability value the defendant makes the smallest possible offer that could have been in any equilibrium. That is, the misinformative equilibrium is defendant's preferred among trial-free equilibria.

Secondly, since the defendant at any liability value (weakly) prefers the settlement to the trial, the misinformative equilibrium is the defendant's preferred equilibrium. □

Proposition 11. *If $\Phi(C) > 0$ and $\varsigma^a(C) < -t^d$, then uninformative equilibrium is defendant preferred equilibrium.*

Proof. I firstly derive the minimal offer made in some equilibrium y^*, at which the trial is avoided. For this offer to be made in some equilibrium and be accepted the following condition must hold:

$$\exists\, x \text{ s.t. } y^* + t^d \leq x \text{ and } p(y^*, r(y^*, x)) = 1 \tag{73}$$

The first part of the condition states that the defendant must prefer settling at y^* for some liability value x, and the second part state that the case is indeed settled at this liability value.

Observe that recommendation cannot be meaningful at the offer y^*. Since the defendant would make an offer for liability value $x \geq y^* + t^d$ and the plaintiff prefers the settlement to the trial only if $y^* + \varsigma^p(C) \geq x\ \Rightarrow\ x < y^* + t^d$. Thus, if the recommendation was meaningful at the offer y^*, then the attorney would have a profitable deviation of changing the recommendation and ensuring trial.

Thus, y^* is a minimal offer that the plaintiff is willing to unconditionally accept. Any such an offer would be made on the equilibrium path for all liability values s.t. $x \geq y^* - t^d$. Thus, the plaintiff beliefs at y^* are $\mathbb{E}[x|y = y^*] = \frac{1}{2}[y^* - t^d + \bar{x}]$. She is willing to accept offer y^*

[38]Unless the non-negativity constraint is relevant.

only if $y^* - \varsigma^P(C) \geq \frac{1}{2}(y^* - t^d + \bar{x})$. Since y^* is minimal the condition holds with an equality and $y^* = \dot{y}$.

So in the uniformative equilibrium the pooling accepted settlement offer is the lowest possibly sustainable in an equilibrium, and what follows it is made for the widest range of liability values, thus the uniformative equilibrium is defendant's preferred. □

Proposition 12. *If $\Phi(C) < 0$ and $\Phi(C) + \varsigma^p(C) < -t^d$ the uninformative equilibrium is defendant's preferred.*

Proof. I show that if $\Phi(C) + \varsigma^p(C) < -t^d$, then there cannot exist an offer lower than $\dot{y}$ that is ever accepted by the plaintiff.

Denote by y^* the lowest offer accepted by the plaintiff in any equilibrium. If the plaintiff's recommendation is meaningful at this offer, then the offer is made for all the liability values from $y^* - t^d$ to $\min\{y^* + \varsigma^a, \bar{x}\}$.

Firstly, I analyze the case in which $y^* + \varsigma^a < \bar{x}$. In this situation the plaintiff's expected payoff under rejecting y^* is $\mathbb{E}[x|y^*, r(y^*) = 1] - \varsigma^p = y^* + \frac{1}{2}(\varsigma^a - t^d) - \varsigma^p$. Rearranging the condition $\Phi(C) + \varsigma^p(C) < -t^d$, one obtains $\varsigma^p(C) < \frac{1}{2}(\varsigma^a - t^d)$. Thus, at any potential offer y^* at which the recommendation is meaningful and $y^* + \varsigma^a < \bar{x}$ the plaintiff is better-off under trial than under the settlement, so no such an offer can be accepted on the equilibrium path.

Secondly, I analyze the case in which $y^* + \varsigma^a \geq \bar{x}$, or equivalently the attorney's recommendation is meaningless at y^*. Then the plaintiff's excerpted payoff under rejecting y^* is $\mathbb{E}[x|y^*] - \varsigma^p(C) = \frac{1}{2}(y^* - t^d + \bar{x}) - \varsigma^p(C)$. At a minimal ever accepted offer the plaintiff is exactly indifferent between the settlement and the trial, i.e $y^* = \bar{x} - t^d - 2\varsigma^p(C) = \dot{y}$.

Thus uninformative equilibrium selects the lowest possible offer at which the trial is avoided, and what follows this offer is made for the widest range of liability values, and so is defendant's preferred. □

Proposition 13. *If $s_t > 0$ then the equilibrium described in Appendix x, is the defendant preferred equilibrium.*

Proof. For keeping the proof concise I focus on the most complex case in which there exists 5 regions of liability values for which the equilibrium behavior is different: from 0 to $\hat{x}$ the case is resolved by trial; from $\hat{x}$ to $\tilde{x}$ the equilibrium behaves as partially informative equilibrium; from $\tilde{x}$ to $\check{x}$ as misinformative equilibrium and from; form $\check{x}$ to $\dot{x}$ the case is resolved by trial and from $\dot{x}$ to $\bar{x}$ there is a pooling offer always accepted by the plaintiff.

Following the procedure from proofs of propositions 8 – 12 observe that $\dot{y}$ is the minimal possible offer that is unconditionally accepted by the plaintiff, and as such it is also made for the widest range of liability values. This implies that a necessary condition for avoiding trial at any other offer is receiving a positive recommendation of the attorney.

For all the liability values in $(\check{x}, \dot{x})$ the defendant prefers trial to obtaining positive recommendation of the attorney/making an offer $\dot{y}$.

For all the liability values in $(\tilde{x}, \check{x})$ the defendant always makes a minimal offer recommended by the attorney.

Now, observe that there cannot exist an offer smaller than y_0 that is ever accepted by the plaintiff. Suppose it does, and denote smallest such an offer by y', and it is accepted by the plaintiff only after the positive recommendation of the attorney. Then such an offer would be made by all the liability values from $y' - t^d$ to $\frac{s_n y' + t^a - f_t}{s_n + s_t}$. For the offer to be accepted by the plaintiff, it must be that $\rho(y' - t^d, C) \leq y'$. But the smallest liability value x for which there exists $y \leq x + t^d$ s.t. $\rho(x, C) \leq y$ is by definition given by $\check{x}$ and the corresponding offer is given by y_0, which yields contradiction.

On the interval $[0, \check{x})$ the defendant prefers the trial to making an offer y_0. On the interval $[\check{x}; \tilde{x})$ the average offer compensates exactly the plaintiff's payoff under the trial, and thus there cannot exist any sequence of offers lower on average that would not lead to trail.

Thus, the equilibrium is defendant's preferred. □

D Proposition 7

Proposition is proved in lemmas 1 – 9.

Lema 1. *Any two contracts $C = (f_n, s_n, f_t, s_t)$ and $C' = (f'_n, s_n, f_t, s_t)$ that are accepted by the attorney, lead to the same total profit for the plaintiff's side.*

Lemma 1 is a consequence of the fact that f_n does not influence the agents' incentives once the contract have been sighed, but rather serves as a pure utility transfer.

Lemma 1 has two main implications. Firstly, it states that the analysis of the optimal contract can be simplified to finding a s_n, f_t and s_t of the contract that maximizes the total expected profit of the plaintiff's side and determine f_n at a level that allows the plaintiff to capture the whole bargaining surplus.

Secondly, it states that, up to f_n the structure of the optimal contract is independent from the bargaining power of the plaintiff and the attorney. That is, the agent offering a contract can be changed without impacting the results of the model.

Lema 2. *For any contract $C = (f_n, s_n, f_t, s_t > 0)$, there exists a contract $C' = (f_n, s'_n, f'_t, 0)$ s.t $\Pi(C) \leq \Pi(C')$*

In the proof I show that by rotating $\varsigma^p(x, C)$ and $\varsigma^a(x, C)$ around an appropriately chosen point, so that $s_t = 0$ (the willingness to settle is rotated so that it becomes a flat line) one can always improve the total expected profits of the plaintiff and the attorney.

The proof is based on the fact that the payoff of the plaintiff's side is determined by $\varsigma^p(x; C)$ and $\varsigma^c(x; C)$. If $s_t > 0$ those coefficients are not constant. Thus, one can find x^* under which the plaintiff's side recovers the biggest part of the bargaining surplus and by appropriately adjusting f_t and s_n, construct a contract under which the $\varsigma^p(x; C')$ and $\varsigma^a(x; C')$ are constant and always take the value of $\varsigma^p(x^*; C)$ and $\varsigma^a(x^*; C)$ respectively.

Firstly, to simplify the analysis, I smooth the actual profit of the plaintiff part at any given x, by replacing the actual payoff under any pooling part of the equilibrium by the $x - \varsigma^p(x; C)$ and ignoring the fact that negative offers are not allowed in the model.

$$\tilde{\Pi}(x; C) = \begin{cases} x - \varsigma^p(x; C) & \text{if } x \in (\check{x}, \tilde{x}) \text{ or } x > \dot{x} \\ x - \varsigma^a(x; C) & \text{otherwise} \end{cases} \tag{74}$$

Secondly, I define the (approximated) bargaining surplus function of the plaintiff's side at point x.

$$B(x; C) = \tilde{\Pi}(x; C) - x + t^a \tag{75}$$

Call x^* the point at which the bargaining surplus of the plaintiff's side is maximized: [39]

$$x^* = \arg\max_x B(x; C) \tag{76}$$

For any contract $C = (f_n, s_n, f_t, s_t > 0)$, take a contract $C' = (f_n, s_n, f_t + s_t x^*, 0)$.
Contract C' is based on rotating $y^a(x; C) = x - \varsigma^a(x; C)$ and $y^p(x; C) = x - \varsigma^p(x; C)$ around x^*. Under the contract C' it must be that:

(a) $B(x, C') = B(x^*, C)\ \forall x \leq \dot{x}'$
Since $\varsigma^p(x, C') = \varsigma^p(x^*, C)\ \forall x$ and $\varsigma^a(x, C') = \varsigma^a(x^*, C)\ \forall x$.
In other words, the bargaining surplus under the new contract is equivalent to the highest smoothed profits under the rotated contract, for all liability values up to a new threshold value $\dot{x}'$, that is, the smallest liability value for which the defendant makes an unrejectable offer under contract C'.
This is a simple consequence of the fact that under a new contract the incentives of the agents are fixed at the level they had in the best case scenario under the old contract.

(b) $\dot{x'} \geq \dot{x}$
Since $\varsigma^p(x, C') < \varsigma^p(x, C)\ \forall x > x^*$ and $\varsigma^a(x, C') > \varsigma^a(x, C)\ \forall x > x^*$ and $x^* \leq \dot{x}$ The liability value at which the defendant makes an unrejectable offer must (weakly) increase. This a consequence of the fact that under a new contract the plaintiff's willingness to settle must (weakly) decrease for all liability values above the rotation point x^*.

(c) $B(x, C') \geq B(x, c)\ \forall x > \dot{x}'$
Since $\varsigma^p(x, C') \leq \varsigma^p(x, C)\ \forall x \geq \dot{x}'$
Since the plaintiff's willingness to settle (weakly) decreased above $\dot{x}$ it must have also decreased above $\dot{x}'$. So the bargaining surplus under an unrejectable offer has increased.

Thus, $\forall\ x B(x, C') \geq B(x, C)$. And therefore, $\Pi(C') \geq \Pi(C)$. Since the bargaining surplus, have (weakly) increased at all the liability values, the expected profits must (weakly) increase as well. The idea behind the proof is also depicted in the example in figures 9.

Lemma 2 has the following consequence: if there exists any optimal contract, there exists an optimal contract under which $s_t = 0$, i.e., contract that leads to an equilibrium of only one type. Thus, I restrict my attention to these contracts.

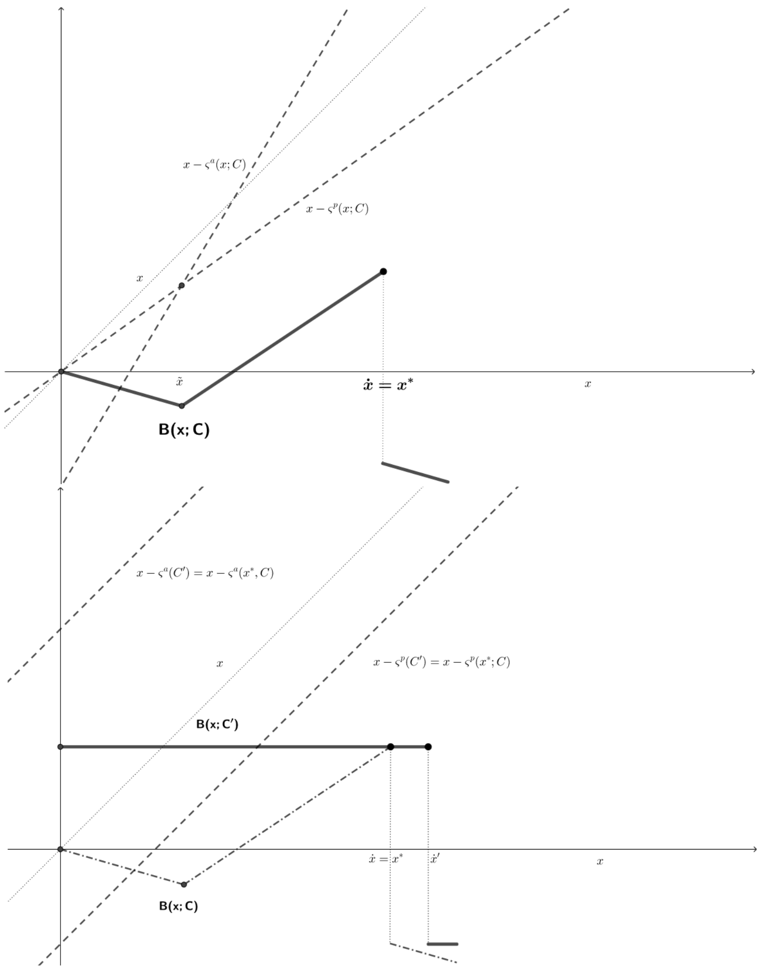
Lema 3. *Contract C^M is an optimal contract among contracts leading to a misinformative equilibrium.*

The proof of the lemma is based on the fact that the payoff of the plaintiff under misinformative equilibrium decreases with $\varsigma^p(C)$ [40] and $\varsigma^p(C^M)$ is the smallest possible among all the contracts leading to misinformative equilibrium. Since the attorney under C^M is indifferent between any outcome of the negotiations $\varsigma^a(C^M)$ is determined by the plaintiff's interest. The proof of the lemma is given in claims 32 – 33.

[39] In case $\arg\max_x B(x; C)$ is not a singleton, I take the minimal value of x maximizing the expression as the solution. The choice is purely a matter of convention.

[40] Completely pooling equilibria with an offer $y = 0$, are an exception. I ignore this possibility since, clearly, a contract leading to such an equilibrium would never be signed, as the plaintiff would be better-off dropping the case.

Figure 9: Lemma 2 - contracts C and C’



Claim 16. $\varsigma^p(C) \geq t^a$ *under any contract leading to a misinformative euilibrium.*

If an equilibrium is to be misinformative it must be the case that: $\Phi(C) > 0$ and $\varsigma^a(C) \geq -t^d$.
Firstly, I analyze the contracts for which $s_n \in (0,1)$: Then, $\Phi(C) = \frac{f_t-(1-s_n)t^a}{(1-s_n)s_n}$ and if $Phi(C) > 0$, then $f_t > (1-s_n)t^a$. So $\frac{f_t}{1-s_n} > t^a$, and thus $\varsigma^p(C) > t^a$.
Secondly, I analyze the contracts for which $s_n = 1$. Then $\Phi(C) \neq \pm\infty$ only if $f_t = 0$. Yet, then $\varsigma^a(C) = t^a$, so for $\Phi(C) > 0$ $\varsigma^a(C) > t^a$. Finally, take contracts with $s_n = 0$. Then, unless $f_t = t^a$, $\Phi(C) = \pm\infty$ and the misinformative equilibrium cannot be sustained. If $f_t = t^a$, then $\varsigma^p(C) = t^a$.
Note that since $\varsigma^p(C^M) = t^a$ claim 32 indeed shows that it is the smallest possible $\varsigma^p(C)$ among all the contracts leading to a misinformative equilibrium.

Claim 17. *If C^M is to be an equilibrium contract $\varsigma^a(C)$ must be the most profitable for the plaintiff.*

It is a consequence of the fact that under C^M, the expression $\frac{t^a-f_t}{s_n}$ is undefined and the attorney is always indifferent between the trial and the settlement. However, in the equilibrium $\varsigma^a(C)$ can be actually pin down to the level that is the most profitable for the plaintiff.

Take some contract C' s.t. $s_n = \varepsilon^s$ ($\varepsilon^s > 0$) and $f_t = t^a + \varepsilon^f$, with ε^i being arbitrarily close to 0 and s.t. $\varsigma^a(C') = -\frac{\varepsilon^f}{\varepsilon^s} = \varsigma^{a*}$. Then $\varsigma^p(C) = \frac{t^a+\varepsilon^f}{1-\varepsilon^s}$, as ε^s and ε^f decrease proportionally, $\varsigma^p(C) \to t^a$. So, had C^M not lead to an optimal $\varsigma^a(C^M)$, there would always exist a profitable deviation for the defendant.
Since $\varsigma^p(C^M)$ is minimal, and $\varsigma^a(C^M)$ must take a value leading to the highest expected total profit of the plaintiff side in the equilibrium; C^M is an optimal contract. [41]

Lema 4. $\varsigma^a(C^M) = \max\{-t^d; -(\frac{\overline{x}}{4} - t^a); \min\{-(\frac{\overline{x}}{3} - \frac{4}{3}t^a); t^a\}\}$

Following, lemma 3 to determine $\varsigma^a(C^M)$ it is enough to solve a profit-maximization problem give $\varsigma^p(C^M) = t^a$.
Firstly, note that if $\varsigma^a(C^M) < t^a - \frac{\overline{x}}{2}$ the equilibrium becomes completely pooling, leading to total expected profits of the plaintiff's side of $\frac{\overline{x}}{2} - t^a$ despite the actual choice of $\varsigma^a(C^M)$.
Now, I analyze the case for which the constraint restricting the settlement offers to be non-negative is not relevant, i.e. $\varsigma^a(C^M) < 0$. Then the maximization problem is the following:

$$\max_{\varsigma^a(C^M)} \frac{\overline{x}}{2} - \varsigma^a(C^M) - \frac{2}{\overline{x}}\big(t^a - \varsigma^p(C^M)\big)^2 \tag{77}$$

Subject to:

$$\varsigma^a(C^M) \leq 0$$
$$\varsigma^a(C^M) \geq -t^d$$

For which the solution is $\varsigma^a(C^M) = \max\{-t^d, -(\frac{\overline{x}}{4} - t^a)\}$.
Now, the situation under which the constraint on negative offers is relevant must be taken into account. Then the maximization problem is the following:

$$\max_{\varsigma^a(C^M)} \frac{\overline{x}}{2} - \varsigma^a(C^M) - \frac{2}{\overline{x}}\big(t^a - \varsigma^p(C^M)\big)^2 + \frac{1}{2}\varsigma^a(C^M)^2 \tag{78}$$

[41] Note that I assumed $\varsigma^a(C^M)$ is constant among liability values, there also exist equilibria under which $\varsigma^a(C^M)$ is weakly decreasing, that would yield an even higher payoff for the plaintiff. These equilibria are analyzed in section 5.

Subject to:

$$\varsigma^a(C^M) \geq 0$$
$$\varsigma^a(C^M) < t^a$$

For which the solution is $\min\{-(\frac{\overline{x}}{3} - \frac{4}{3}t^a); t^a\}$.

Lema 5. *Contract C^S is an optimal contract among the contracts leading to a partially informative equilibrium.*

The proof is similar to the proof of 3. I observe that as long as the constraints are satisfied $\varsigma^a(C)$ does not influence the profits under partially informative equilibrium, however, the profits are decreasing in $\varsigma^p(C)$. Then, I argue that since $\varsigma^a(C^S)$ is the smallest possible among the contracts leading to partially informative equilibrium and it allows for the constraint to be satisfied under the smallest $\varsigma^p(C)$. Finally, since the plaintiff is always indifferent between any outcome during the negotiations phase under C^S, in the equilibrium $\varsigma^p(C^S)$ is the smallest possible. The lemma is proven in claims 34 and 35.

Claim 18. *Under any contract leading to a partially informative $\varsigma^a(C) \geq t^a$.*

Firstly, I analyze contracts for which $s_n \in (0,1)$. Then $\varsigma^a(C) = \frac{t^a - f_t}{s_n}$. Now suppose $\varsigma^a(C) < t^a$, this implies that $t^a < \frac{f_t}{1-s_n}$. However, since $\Phi(C) < 0$ and $\Phi(C) = \frac{f_t-(1-s_n)}{(1-s_n)s_n}$ it must be that $t^a > \frac{f_t}{1-s_n}$, which is a contradiction.
Now take any contract with $s_n = 0$, then, unless $f_t = t^a$, $\Phi(C) = \pm\infty$, and the partially informative equilibrium cannot be sustained. However, if $f_t = t^a$, then $\varsigma^p(C) = t^a$ and for $\Phi(C) < 0$ it must be that $\varsigma^a(C) > t^a$.
Finally, take any contract with $s_n = 1$. Then $f_t > 0$, $\Phi(C) = +\infty$ and the partially informative equilibrium cannot be sustained. If $f_t = t^a$, $\varsigma^a(C) = t^a$.

Claim 19. *If C^S is to be an equilibrium contract $\varsigma^p(C^S)$ would always take a value maximizing the total payoff of the plaintiff and the attorney given $\varsigma^a(C^S) = t^a$.*

If this had not been so, then the attorney would have a profitable deviation of not accepting (C^S). Knowing that the attorney will not accept C^S, the plaintiff would propose a contract arbitrarily close to the C^S, with $\varsigma^a(C) = t^a$, and $\varsigma^p(C)$ arbitrarily close to selected $\varsigma^p(C^S)$, that would have been accepted by the attorney. However, for any such contract there would exist a better contract (even more similar to C^S). Thus, the best response of the plaintiff would not be well defined.

Lema 6. $\varsigma^p(C^S) = \frac{1}{2}\max\{0, t^a - t^d\}$

The lemma is a consequence of the fact that the total excepted profits of the plaintiff's side are decreasing in $\varsigma^p(C^S)$. So either the non-negativity constraint or the constraint on the incentives of the agents must be binding.

Lema 7. *Contract C^S leads to higher total profits for the plaintiff's side than any contract leading to a perfectly informative equilibrium*

Proof of the lemma is a consequence of profits comparison under C^S and any contract s.t. $\varsigma^p(C) = \varsigma^a(C)$, since $\varsigma^p(C) = \varsigma^a(C)$ implies $\varsigma^p(C) = t^a$.

Lema 8. *Any contract that leads to an Uniformative Equilibrium that is not completely pooling cannot be optimal.*

Firstly, I find an optimal contract among those not leading to a completely pooling equilibrium.[42]

$$\max_{\varsigma^p(C)} \frac{\overline{x}}{2} - \frac{\overline{x} - 2\varsigma^p(C) - 2t^d}{\overline{x}} t^a - \frac{2\varsigma^p(C) + 2t^d}{\overline{x}} \varsigma^p(C) \tag{79}$$

s.t.
$\varsigma^p(C) \geq 0$
$\varsigma^p(C) \leq \frac{\overline{x}}{2} - t^d$
Observe that if $\frac{\overline{x}}{2} < t^d$ the problem does not have a solution, i.e., any uninformative equilibrium would necessarily be completely pooling.
Otherwise the solution of the problem is given by:
$\varsigma^p(C) = \max\{0; \min\{\frac{t^a - t^d}{2}; \frac{\overline{x}}{2} - t^d\}\}$ If $\varsigma^p(C) = \frac{\overline{x}}{2} - t^d$ the equilibrium becomes completely pooling.
If $\varsigma^p(C) = \frac{t^a - t^d}{2}$ the profits are:

$$\Pi(C) = \frac{\overline{x}}{2} - \frac{\overline{x} - t^a - t^d}{\overline{x}} t^a - \frac{t^a + t^d}{\overline{x}} \frac{t^a - t^d}{2} \tag{80}$$

Since $\varsigma^p(C) = \frac{t^a - t^d}{2}$ only if $t^a \geq t^d$ then $\Pi(C) < \Pi(C^S) = \frac{\overline{x}}{2} - \frac{t^a - t^d}{2}$ If $\varsigma^p(C) = 0$ the profits are:

$$\Pi(C) = \frac{\overline{x}}{2} - \frac{\overline{x} - 2t^d}{\overline{x}} \tag{81}$$

Since $\varsigma^p(C) = 0$ only if $t^a \leq t^d$; $\Pi(C) < \Pi(C^S) = \frac{\overline{x}}{2}$

Lema 9. *Contract C^P s.t. $f_t = \max\{0; \frac{\overline{x}}{2} - t^d\}$ and $s_n = 1$ is an optimal contract leading to a completely pooling uninformative equilibrium*

The optimal contract must solve:

$$\max_{\varsigma^p(C)} \frac{x}{2} - \varsigma^p(C) \tag{82}$$

S.t.
$\varsigma^p(C) \geq 0$
$\varsigma^p(C) \geq \frac{\overline{x}}{2} - t^d$
The solution of the problem is $\varsigma^p(C) = \max\{0; \frac{\overline{x}}{2} - t^d\}$ $\varsigma^p(C^P) = \max\{0; \frac{\overline{x}}{2} - t^d\}$
$\varsigma^a(C^P)$ is always sufficiently different from $\varsigma^p(C^P)$:
If $\max\{0; \frac{\overline{x}}{2} - t^d\} > t^a$ then $\varsigma^a(C^P) = -\infty$;
If $\max\{0; \frac{\overline{x}}{2} - t^d\} < t^a$ then $\varsigma^a(C^P) = +\infty$;
If $\max\{0; \frac{\overline{x}}{2} - t^d\} = t^a$ then $\varsigma^a(C^P)$ can take any arbitrary value.

The proof of the remaining part of the proposition directly follows the comparison of the profits under each of the contracts.

[42]Note that since profits are independent from $\varsigma^a(C)$, the optimization problem can be conducted with respect to $\varsigma^p(C)$ rather than s_n and f_t. Having determined $\varsigma^p(C)$ one can always construct a contract leading to $\varsigma^a(C)$ being sufficiently high (or low).