Conflict with Quitting Rights: A Mechanism Design Approach

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Conflict with Quitting Rights: A Mechanism Design Approach

Madhav S. Aney

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Conflict with Quitting Rights: A Mechanism Design Approach

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Abstract

Why do agents engage in costly dispute resolution such as litigation and arbitration when costless settlement is available? I present a model with one sided asymmetric information where the payoff from litigation for both agents depends on the beliefs of the uninformed agent. Taking these payoffs as their outside options, agents negotiate over the allocation of an indivisible object that is in dispute and transfers. It is shown that it is impossible to implement an allocation that satisfies budget balance that guarantees the agents their payoff from conflict when agents can quit negotiations unilaterally at any stage.

1 Introduction

Underpinning much of the architecture of neo-classical economics lies the assumption of an omniscient judiciary. The existence of such a judiciary deters undesirable behaviour. From Arrow-Debreu contingent commodities to incentive contracts, agents perform their legal obligations in the knowledge that if they do not, they will be punished. Although invoking the court is costly, this does not lead to an inefficiency since even in the unlikely event of a dispute, there is instantaneous resolution through bargaining as both parties are aware that taking the dispute to court is costly.

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This logic creates the paradox of litigation: why do we observe litigation at all when parties are aware of its costliness and costless settlement is available? This paper attempts to contribute to the large literature that address this question. In this model parties have private valuation of the subject matter in dispute. Unlike the standard setting with asymmetric information, there are two additional ingredients that are both necessary in this model for non existence of efficient settlement. First, the beliefs of the uninformed agent affect the payoff of both uninformed and the informed agent. And second, agents have the right to quit negotiations unilaterally.

In this model the uninformed agent always has a higher valuation of the surplus. In the presence of quitting rights there is a need to allocate the surplus efficiently to the uninformed agent to ensure conflict is avoided for any possible revelation during negotiations. However this constrains the transfers to the informed agent to be independent of his declaration. The main result of the paper in proposition 1 shows that it is impossible to find a transfer that is high enough to satisfy the ex-post participation of the informed agent for any realisation of his type and low enough to satisfy the interim participation constraint of the uninformed agent. In other words, negotiations make at least one of the two agents strictly worse off. Thereafter I show (section 2.5) how agents avoid litigation in this framework if they can commit not to use their quitting rights unilaterally. Finally I show (section 3) how some of the assumptions about the litigation payoffs required for the results arise endogenously when the litigation game is assumed to take the form of a Tullock contest. I argue (section 4.2.2) that this explanation for the existence of litigation generalises to some other forms of conflict as well.

This paper contributes in two ways to the large literature that deals with this question. First, it endogenises the informational asymmetry about the agents’ outside options using non certifiable information about valuations. This contribution is discussed in greater detail in section 1.1.1. Second, it derives conditions under which this type of informational asymmetry causes negotiations to break down even with the best possible mechanism. This is discussed in section 1.1.2. Finally, the novel theoretical contribution of this paper in relation to the mechanism design literature is discussed in section 1.2.
1.1 Relationship to Law and Economics Literature

The large literature that has arisen in response to the question of why people litigate is now two generations old. The first generation literature started with Landes (1971) who argued that litigation arises when its expected benefit is greater than the expected costs for the parties. Parties do not strategically interact at the pre-trial stage and litigation is avoided when the expected benefit of litigating is lower than the expected cost. Out of court settlement occurs when parties have similar expectations about the outcome of the trial. It is worth explaining this point.

Uncertainty about the outcome of a trial is not sufficient to create litigation. With uncertainty, both parties would form expectations about their payoff from litigation. If the probabilities both associate with winning add up to one, they would settle outside thereby saving themselves the cost of litigation. Litigation arises for instance if both parties overestimate their chances of winning in court. Though this literature acknowledges the role of such overestimation in generating litigation, it stops short of modelling how this overestimation arises and, more importantly, the strategic behaviour of parties when they negotiate in the presence of such overestimation.\footnote{More examples include Gould (1973), Posner (1973), and Priest and Klien (1984).}

In response to this unresolved issue, a second generation literature arose starting with P’ng (1983) and Bebchuk (1984). In Bebchuk (1984), the defendant knows the probability of winning whereas the plaintiff only knows the distribution over the probability of winning. The plaintiff makes an offer of settlement which the defendant can accept or reject. If the offer is rejected, the case goes to court. Since this bargaining game is played out between parties in an environment of incomplete information, the inefficiency of litigation arises.\footnote{This result has been generalised in different ways. Schweizer (1989) allows for both parties to be in possession of private information. Nalebuff (1987) allows for the informed agent to make the settlement offer, thereby considering the signalling implications of the size of the offer and its rejection. Spier (1992) considers more stages to bargaining. Friedman and Wittman (2006) explore pre-trial settlement when parties employ the Chatterjee and Samuelson (1983) protocol for bargaining. Although, as noted in Daughety and Reinganum (1994), the predictions of these models vary in terms of equilibrium allocations for plaintiff and defendant, a non-zero probability of litigation emerges as a robust phenomenon. In fact, Spier (1994), using a mechanism design approach, shows that litigation would arise even when parties bargain using the most efficient extensive form. See Cooter and Rubinfeld (1989) and Hay and Spier (1998) for surveys of this literature.}

This is a reflection of the broader theoretical insight that full efficiency is not guaranteed with bargaining under incomplete information. In the next two subsections the two problems with the second generation literature that this paper
seeks to address are explained.

### 1.1.1 Litigation and Full Disclosure

The first problem with the literature is the relationship between private information of parties and the unobservability of the opponent’s payoff from litigation. The justification given in this literature for private information leading to litigation payoffs being unobservable is that a party to a dispute may be in possession of information that once revealed in court, increases its probability of winning.\(^3\)

However if parties possess information that is assumed to be certifiable in court, parties can choose to reveal it to each other outside court at the pre-trial stage and consequently avoid costly litigation through bargaining under complete information. This is a problem since it turns out that in the setting of these models, parties always have an incentive to disclose their private information.

Grossman (1981) shows that when private information is certifiable, there are very strong incentives to reveal it. This is because an agent with information favourable to himself always wants to reveal it to increase the size of the offer from his opponent. This leads to an unravelling since the agent who chooses not to reveal his information ends up signalling that he has unfavourable information.\(^4\)

I propose a different approach by assuming that the asymmetry between parties is about information that is inherently non-certifiable. In my model, a party’s valuation of the subject matter is private information. I show (section 3) that this valuation determines the amount of effort an agent is willing to exert in court, which in turn generates a probability of winning that is private information of the party. Hence the diverging expectations that parties have about the payoff from litigation are endogenously generated. In contrast to private information on evidence which can be certified by the informed agent, private information on evidence which can be certified by the informed agent,\(^3\)

Although the literature has focused on this channel, there are other channels through which private information can generate unobservability of the payoff from litigation. For example, even if parties have the same priors but have private valuations of the subject matter in dispute, this is sufficient for bargaining to be inefficient. What is required is that the expected payoff from litigation be private information. Overestimating the probability of winning in court is only one of the ways in which this may happen.

\(^4\)Okuno-Fujiwara et al. (1990) derive conditions sufficient for this argument to work. Shavell (1989) observes that this argument in the setting of litigation leads to certifiable private information washing away before trial through voluntary disclosure and that voluntary disclosure needs to be ruled out exogenously for information asymmetry to arise in his model. Similar to this paper, Hay (1995) also uses endogenous effort choices as a way of generating asymmetric information and finds the existence of litigation in equilibrium while focusing on laws mandating full disclosure. However the model is constructed under the implicit assumption that the unravelling argument outlined above does not apply.

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declarations of valuation are essentially cheap talk; all types would declare that they have high valuation since this increases the settlement offer they are likely to receive.

1.1.2 Litigation and Communication

The second problem with the literature on litigation is its focus on bargaining as a means of resolving disputes outside court. Focusing attention singularly on bargaining implies that parties are restricted to interact through offers and counter offers of the surplus and transfers are ruled out. This assumption is not restrictive when parties have the same valuation over the surplus. However, in an environment with private valuation this turns out to have a bite since there could be settlement equilibria for instance when an agent with high valuation offers transfers to one with low valuation in exchange for the surplus.

Communication between parties can include a sequence of messages exchanged in a rich language that could, in principle, mitigate the informational asymmetry that exists between parties. To give just one example, going back to the argument outlined in the previous subsection, the possibility of communication eliminates entirely any informational asymmetry arising from certifiable pieces of information leading to efficient settlement in the second generation models of litigation. Hence by restricting the form of pre-trial negotiation to be of the bargaining variety, it is possible to miss out on equilibria in which parties settle out of court.

The model presented here attempts the resolution of this problem using a mechanism design approach. The seminal paper by Myerson (1982) shows that an equilibrium of any Bayesian game can be replicated through a direct mechanism. This result is known as the revelation principle. Using this insight, the result presented here will show that litigation may arise even when no restrictions are made about the nature of communication between parties during pre-trial negotiation. Since bargaining games under incomplete information form a subset of the Bayesian games parties could play, this is subsumed in the model presented here.

This paper is part of growing literature that seeks to understand litigation using mechanism design. For instance Mnookin and Wilson (1998) analyse disclosure in a mechanism design setting. In a similar vein Klement and Neeman (2005) also use a mechanism design approach to analyse the effect of different fee shifting rules on balancing the trade-off between minimising litigation and
deterring disputes. This paper differs from these in that it attempts to take on board the full disclosure critique by assuming that certifiable information is fully disclosed at the negotiation stage as a result of parties communicating freely with each other.

1.2 Relationship to Mechanism Design Literature

This paper presents a new impossibility result that is not subsumed by Myerson and Satterthwaite (1983) and related literature. Unlike the literature based on Myerson and Satterthwaite (1983), where the uncertainty of gains from trade is necessary, here the inefficiency of conflict is common knowledge between parties who are consequently aware that out of court settlement is always more efficient. In technical terms this implies that two sided private information is not required and moreover it is common knowledge that valuation of the uninformed agent is always greater than that of her opponent. Hence the distribution of valuations of the two agents do not intersect. However, in contrast with Myerson and Satterthwaite (1983), there are two additional ingredients here. First, the interdependence of outside options of both agents on the beliefs of the uninformed agent, and second, the ability of parties to quit negotiations unilaterally. The second requires the use of ex-post individual rationality compared to the weaker interim individual rationality required by Myerson and Satterthwaite (1983).

Of the papers related to Myerson and Satterthwaite (1983) this paper is most closely related to Compte and Jehiel (2009) in the use of ex-post participation constraints arising from the assumption that parties can quit negotiations unilaterally. There are two key differences. First, the inefficiency showcased here does not require any uncertainty about who values the surplus more and consequently only requires one sided private information. Second, the inefficiency in this model arises from the dependence of the outside options for both agents on the uninformed agent’s belief about the type of the informed agent.

This paper is also related to Celik and Peters (2011) who consider the possibility of signaling through rejection of mechanism. In their paper, parties can design a mechanism before playing a default game that allows the type of the informed agent to be revealed, modifying the beliefs under which the default game is played. In that setting, allowing the possibility of rejection of the mechanism increases the set of implementable allocations. In contrast, in my setting, the parties attempt to use a mechanism to avoid playing the default game altogether and the possibility of rejection of the mechanism ex-post eliminates the
existence of allocations that allow them to do that.

2 Model

There are two agents who find themselves in a dispute. The subject matter of the dispute is characterised as an indivisible surplus over which agents have competing claims. Both agents have a non-negative valuation of the surplus which is their type. Agent 1’s (female) valuation is $\theta_1$, which is observable, whereas agent 2’s (male) valuation is unobservable and can be $\theta_H$ with probability $q_H$ and $\theta_L$ with probability $1 - q_H$. I assume

**Assumption 1.**

$$\theta_1 > \theta_H > \theta_L.$$

The assumption that the valuation of a party is unobservable is the key driver of litigation in this model. It is worthwhile to see some examples where litigation can be interpreted as a dispute over surplus. These examples have been chosen to illustrate how the model may apply to a large range of situations. Examples include:

- Dispute over property: A party has private valuation over a piece of property and it is unclear as to who has title over it. The property could be tangible such as a house or intangible such as an invention.

- Suits for specific performance: There may be a dispute as to whether an agent has performed his contractual obligation. The plaintiff may have private valuation over the benefit accruing from the action or the defendant may have private information about the costs of performing the action.

- Custody battle over a child: When a couple separates, the spouses may have private valuations over the custody of their child.

Private valuation of the subject matter in dispute is plausible when the dispute involves something other than pure monetary compensation.

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5What is required here is that the sum of the valuations of a party over divisions of the surplus is significantly lower than the valuation over the whole surplus. The assumption of indivisibility guarantees this in stark terms since indivisibility implies a zero valuation over any division of the surplus.

6In an earlier draft, a model with two sided private information was presented. The assumption of one sided asymmetric information is preferred for two reasons. First, it simplifies the model considerably while delivering a clearer intuition about the result. Second, it demonstrates more clearly how the mechanics that drive the result are not the ones subsumed in Myerson and Satterthwaite (1983) and related papers.
Timeline:

**Stage 1:** A dispute arises between the two parties. Parties decide to either litigate or negotiate.

**Stage 2:** If parties choose to negotiate, they play a game that may help them avoid taking the matter to court.

**Stage 3:** Parties either accept the equilibrium allocation of the game played in stage 2, or approach the court.

**Stage 4:** If either agent approaches the court, the court makes a final decision.

At this point, we can preview how the result of litigation in equilibrium is established. As a consequence of the ex-post participation constraints arising from stage 3, the surplus will have to be allocated efficiently to agent 1 who always has higher valuation. This implies that for incentive compatibility, the transfer to agent 2 must be independent. However due to budget balance, going back to stage 2 it will be impossible to satisfy interim participation constraint for agent 1. This implies that in stage 1, anticipating the failure of negotiations, agents will choose to litigate.

To solve the model backwards, I will start with the payoff from litigation in stage 4 in section 2.1. For litigation to be avoided this payoff from litigation must be weakly lower than the allocations prescribed by the mechanism in stage 3 for at least some belief that agent 1 holds following the revelations compatible with those allocations. This is discussed in section 2.2. Finally, going back to the start of stage 2, for agents to participate in negotiations, the allocations from stage 3 must be greater than the interim participation constraints arising from litigation at that point. This is discussed in section 2.3. The result of litigation in equilibrium arises when there are conditions under which agent 1 anticipates that the payoff from litigation will dominate any possible equilibrium allocation from the mechanism. Proposition 1 establishes this result.

Before we solve the model, note that the only piece of asymmetric information in this model is the type of agent 2. The posterior probability that agent 1 associates with agent 2 being a high type can be represented as

\[ q = \frac{q^H (1 - \gamma)}{q^H (1 - \gamma) + q^L \gamma}, \quad \gamma \in [0, 1] \]  

(1)

where \( \gamma \) is the probability of agent 2 making the particular declaration he has made conditional on being high type. If agent 2 makes a declaration that would
only be made by a high type then $\gamma = 0$ and he is revealed to be a high type with certainty. Similarly if he makes a declaration that can only be made by a low type then $\gamma = 1$. If no information is revealed by agent 2’s declaration then $\gamma = \frac{1}{2}$ and the posterior of agent 1 is equal to her prior. Hence all possible posterior beliefs of agent 1 can be captured by varying $\gamma \in [0,1]$. Agent 1’s prior $q_H$, and the information revealed by the end of stage 3 captured by $\gamma$ are common knowledge. Consequently $q$, the posterior belief of agent 1 at the end of stage 3, is also common knowledge. With some abuse of notation I treat $q \in [0,1]$ as the space of all possible beliefs of agent 1 in which the prior $q_H$ is one element. The prior beliefs of agent 1 are represented by $q = q_H$. Following Celik and Peters (2011), I treat $q$ as a sufficient statistic for any information that is revealed during negotiations.

\section{Litigation}

Litigation can be thought of as a game of incomplete information that agents play in court. Agent 1 chooses her actions based on her belief about agent 2’s type while agent 2 chooses his action based on his true type and on agent 1’s belief about his type. In principle, this game can be static or staggered over multiple periods. At this stage we can remain entirely agnostic about these issues and focus directly on the equilibrium payoffs of the two players. Another thorny issue that could arise is one of multiple equilibria in the litigation game. This paper has nothing to say about how agents compute their expected payoffs in the face of multiple equilibria. The goal here is to take the expected payoffs as exogenous and place conditions on them such that we can derive our result about the unavoidability of litigation. In section 3 we will see how the assumptions required for the result arise endogenously when the litigation game is assumed to take the form of a generalised Tullock contest. Let $x_1(q)$ and $x_j(q)$ be the equilibrium actions of the two agents. The expected payoffs can be represented as

\begin{align*}
&v_1(x_1(q), \theta_1, q) \quad \text{and} \quad v_j(x_1(q), x_j(q), q, \theta_1, \theta_j) \\
&\text{(2)}
\end{align*}

Going forward, to simplify notation, I will suppress the equilibrium actions and types and denote the value functions as $v_1(q)$ and $v_j(q)$. This paper has nothing to say about how this expectations are formed. The value functions of the two agents depend on agent 1’s belief about agent 2’s type where $q$ is the probability she associates with agent 2 being a high type.

To capture the fact that litigation is inefficient we may focus on the case
where
\[ \theta_1 > v_1(q) + E_j(v_j(q)) \quad \forall q \in [0, 1]. \quad (3) \]

This implies that since agent 1’s valuation is always higher than that of agent 2, in expected terms it is always better to settle out of court by allocating the surplus to agent 1 in exchange for some transfer to agent 2. In the absence of equation (3), it would be efficient for parties to pursue litigation since the expected surplus would be higher with litigation. However what we will find is that the results of the paper arise even when equation (3) holds.

One of the properties of these payoffs is that it is possible that agent 2 is allocated the surplus with a positive probability in the litigation game. This leads to the following question: why do courts allocate the surplus to agent 2 at all when agent 1 is known to have a higher valuation of the surplus? This question is not answered in the paper. In reality courts typically base their decisions on other factors such as the claims of the parties regarding property rights over the surplus. The question of why courts base their decisions on other factors, when it is clearly ex-post efficient to base these entirely on valuations, is an interesting question of optimal institutional design that is not addressed here. Taking the assumption of an inefficient court system as exogenous, what is derived here is the inability of agents to settle their disputes out of court regardless of how well they negotiate.

2.2 Ex-Post Participation

The allocations arising from negotiation need to satisfy ex-post participation constraints. This implies that the allocations should guarantee a payoff that is weakly greater than the expected payoff from litigation for both parties. Although, ex-ante an allocation contains a probability of the surplus being allocated to either of the two agents, ex-post since the surplus is indivisible, it must go to one of them. The agents make their decision about whether to litigate after this realisation. To analyse the ex-post participation we must look separately at the constraints that arise when the surplus goes to agent 1 and when it goes to agent 2. Let \( \mu_1(q) \) be agent 1’s payoff when the surplus is allocated to her and \( \mu_j(q) \) be the payoff of type \( j \) agent 2 when the surplus is allocated to him. The ex-post participation constraints are
\[ \begin{align*}
\theta_1 - v_j(q) &\geq \mu_1(q) \geq v_1(q), \\
\theta_j - v_1(q) &\geq \mu_j(q) \geq v_j(q), \\
&\quad j \in \{H, L\}.
\end{align*} \tag{4} \]

The first constraint arises when the surplus goes to agent 1. In this case the payoff to agent 1 is her valuation \(\theta_1\) net of the transfer she makes to agent 2. The transfer to agent 2 must be at least \(v_j(q)\), his ex-post participation constraint. Hence \(\theta_1 - v_j(q) \geq \mu_1(q)\). Moreover \(\mu_1(q)\) must also be greater than \(v_1(q)\) to ensure that the ex-post participation constraint of agent 1 is satisfied.

The second equation is the corresponding constraint for when the surplus is allocated to agent 2.

Note that \(q\) is the posterior belief of agent 1 about agent 2 being a high type. As long as there exists a \(q\) such that these constraints, along with the incentive constraints that are to follow in section 2.3, are satisfied there would be a possibility of avoiding litigation as long as the allocation from the mechanism leaves agent 1 with the ‘optimal’ belief such that the payoff from litigation thereafter is lower than the allocation offered to her. The results will establish the conditions under which this will not be possible.

2.3 Incentive Compatibility

Before resorting to costly litigation, parties can play any Bayesian game in the form of negotiation. This problem of a general game form is tractable using the revelation principle since any equilibrium in a Bayesian game can be replicated by the use of a direct mechanism where the parties reveal their types truthfully to a mediator. To see whether litigation can be avoided, we need to check whether an allocation that weakly dominates the payoffs from litigation for the two agents, and one that does not require external financing is implementable.\(^7\)

Consider a direct mechanism where agent 2 declares a type \(j\) where \(j \in \{H, L\}\). If the declaration of agent 2 is \(\theta_j\), then agent 2 is allocated the surplus with probability \(\delta_j\) and agent 1 is allocated the surplus with probability \(1 - \delta_j\). The expected transfers for agent 1 and a type \(j\) agent 2 are \(t_1\) and \(t_j\).

\(^7\)It is reasonable to impose the restriction of no external financing since parties in the real world cannot expect outside subsidies for the settlement of private disputes. If budget balance is not imposed then in this set up the problem would disappear since a Groves mechanism would always ensure incentive-compatibility. See Groves (1973) and the generalisation in Arrow (1979) and d’Aspremont and Gerard-Varet (1979).
respectively. Following are standard the incentive-compatibility constraints for agent 2 for the direct mechanism

\[
\begin{align*}
\delta_H\theta_H + t_H & \geq \delta_L\theta_H + t_L \\
\delta_L\theta_L + t_L & \geq \delta_H\theta_L + t_H,
\end{align*}
\]

which can be rewritten as

\[
(\delta^H - \delta^L)\theta_H \geq t_L - t_H \geq (\delta^H - \delta^L)\theta_L.
\] (5)

The exercise here is to find an allocation composed of transfer \(t_j\) along with probability \(\delta_j\) that satisfy incentive-compatibility, budget balance, and ex-post participation for both types. If such an allocation exists then agent 2 would reveal his type truthfully knowing that the allocation guarantees that agent 1 cannot credibly threaten litigation ex-post. Since \(\delta_j\) may be positive, and the surplus is indivisible, there could be states when the surplus is allocated to agent 2 even though agent 1 always has a greater valuation of the surplus. I will rule this out using the following assumption

**Assumption 2.**

\[
v_1(q) + v_H(q) > \theta_H, \quad \forall q \in [0, 1].
\]

**Lemma 1.** If assumption (2) is satisfied and budget balance is imposed, the surplus must always be allocated to agent 1, and the transfer to agent 2 must be constant in his declaration.

**Proof.** First note that the incentive compatibility constraints from equation (5) implies that \(\delta_H \geq \delta_L\). Hence \(\delta_H = 0\) implies \(\delta_L = 0\). Consider a state where the surplus is allocated to a high type agent 2. In this case the second ex-post participation constraint from equation (4) applies. This implies that agent 1 must get a transfer of at least \(v_1(q)\) and \(\mu_H(q)\) can be at most \(\theta_H - v_1(q)\). If however assumption (2) holds then no \(\mu_H(q)\) is feasible under budget balance such that \(\mu_H(q) \geq v_H(q)\). Hence \(\delta_H = \delta_L = 0\), and the surplus must always be allocated to agent 1. Substituting into the incentive constraints in equation (5)

\footnote{Note that a direct mechanism captures equilibria of any game played at the negotiation stage as a consequence of the revelation principle. See Bester and Strausz (2001) for an extension of the revelation principle to environments without commitment where there is a single agent with private information.}
This implies

$$t_H = t_L.$$  

This lemma shows that when assumption (2) holds, it will not be possible for agents to play a game at the negotiation stage that yields an equilibrium allocation with a positive probability of the surplus being transferred to agent 2. This is because in the event the surplus is allocated to agent 2, agents would find that even the maximum possible transfer to agent 1 that agent 2 is willing to make does not satisfy her ex-post participation constraint. Therefore, ex-ante, if agents are to avoid litigation we must restrict attention to allocations where the surplus goes to agent 1 with certainty and the transfer to agent 2 is constant. Since agent 2 knows that the surplus will always go to agent 1, he has an incentive to make the declaration that guarantees him the maximum possible transfer. The only way to incentivise him to tell the truth is to make the transfer independent of his declaration.

2.4 Result

In this section we will establish the result of unavoidability of litigation. The result will show how no implementable allocation exists that yields a payoff to the agents that is at least as high as $v_1(q_H)$ and $v_j(q_H)$, the expected payoffs from litigation.

I will assume that the value functions of both agents are continuous in $q$, the posterior probability that agent 1 associates with agent 2 being a high type. The assumption of continuity guarantees that the complete information value functions arise as the limits of the incomplete information value functions as the uncertainty about agent 2’s type disappears. Let $v_i^j$ be the complete information value function for agent $i$ when agent 2 has type $j$. Finally we need

**Assumption 3.**

$$\lim_{q \to 0} \left( v_1(q) + v_H(q) \right) > \theta_1.$$  

Since value functions are continuous in $q$ equation assumption (3) implies that there exists a $q^*$ such that

$$v_1(q) + v_H(q) \geq \theta_1 \quad \forall q \in [0, q^*].$$  

(7)
This condition guarantees overestimation. In an environment of complete information, the litigation payoffs of the two opposing agents must always add up to less than $\theta_1$ due to the inefficiency of litigation. When types are unobservable and $q$ is small, agent 1 expects agent 2 to be a low type. However in the event agent 2 is actually a high type, equation (7) guarantees that agent 1 overestimates his expected payoff from litigation and that this rational overestimation is large enough to generate litigation. We are now ready to prove the result.

**Proposition 1.** If the litigation payoffs are continuous in $q$ and satisfy assumptions (2) and (3) then there exists a $q^*$ such that for $q_H < q^*$ no implementable allocation exists that yields a payoff at least as high as the payoff from litigation for the two agents.

**Proof.** First note that lemma 1 shows that when assumption (2) holds, for an allocation to satisfy the ex-post participation constraints, the surplus must be allocated to agent 1, and the transfer to agent 2 must be constant in his declaration. Let us call this transfer $t = t_H = t_L$. This must satisfy

$$t \geq \max\{v_j(q_H)\} \quad \forall j \in \{L, H\} \quad (8)$$

to ensure that agent 2’s ex-post participation constraint is satisfied. Similarly we need agent 1’s allocation to satisfy her interim participation constraint. That is

$$\theta_1 - t \geq v_1(q_H) \quad (9)$$

However assumption (3) implies that there exists a $q^*$ such that for $q_H < q^*$

$$v_1(q_H) + v_H(q_H) > \theta_1. \quad (10)$$

Since $t \geq v_H(q_H)$, no $t$ exists that can simultaneously satisfy constraints in equations (8) and (9). Consequently no implementable allocation exists that yields a payoff that is at least as high as the payoff from litigation for both parties.

This result shows that at least one of the two agents will reject negotiations because he or she will expect to do strictly worse than the litigation outcome. The intuition for this result is as follows. If the sum of the expected payoffs from litigation for agent 1 and high type agent 2 are high enough, the surplus must always go to agent 1. In this case the transfer to agent 2 must be independent of
his type. This is shown in lemma 1. Consequently the lowest transfer that must be made to agent 2 to ensure that his ex-post participation is \( v_H(q) \). Proposition 1 shows that when agent 1’s prior \( q_H \) is low enough she prefers to litigate rather than treat agent 2 as if he were a high type. The result indicates that litigation will be inevitable in stage 1 for distributions when the \( q_H \) is less than \( q^* \) since agents will correctly anticipate the breakdown in negotiations.

### 2.5 No Veto Rights

As we would expect, if parties can be prevented from quitting negotiations unilaterally, then this is sufficient to avoid litigation. This can happen if contracts where parties waive their right to litigate are enforceable. In this section I will show that once we take away an agent’s right to veto allocations ex-post, it is possible to come up with an implementable allocation that the agents would prefer over litigation.

**Proposition 2.** There always exists a budget balanced and incentive compatible allocation that Pareto weakly dominates the equilibrium allocation under litigation.

*Proof.* Let the payoffs to agent 1 and type \( j \) agent 2 from litigation be 
\[
    v_1(q_H) = \alpha_1(q_H)\theta_1 + x_1 \quad \text{and} \quad v_j(q_H) = \alpha_j(q_H)\theta_j + x_j.
\]
Since these are assumed to arise from a bayesian game they must satisfy incentive compatibility. Moreover since the litigation game is unsubsidised by a third player it also satisfies budget balance. Hence we can simply set 
\[
    \delta_1 = \alpha_1(q_H), t_1 = x_1 \quad \text{and} \quad \delta_j = \alpha_j(q_H), t_j = x_j.
\]
These allocations satisfy the interim participation constraints for agent 1 and both types of agent 2 trivially.

The proof of proposition 2 is constructive. It shows the allocation that satisfies incentive compatibility, budget balance, and the interim participation constraints is the allocation from conflict itself. When ex-post constraints no longer need to be satisfied it is possible to set \( \delta_H > 0 \). This implies that \( t_H = t_L \) is no longer necessary for incentive compatibility ensuring that it is possible to guarantee agent 1 \( v_H(q_H) \) for all possible \( q_H \).

Proposition 2 shows that under full contractability, at the very least it is always possible to replicate the litigation payoffs through negotiations. Hence litigation would never occur since it would be (at least weakly) individually rational for agents to contract away their quitting rights at the start of negotiations.
Consequently it would not be possible for an agent to credibly threaten their opponent with litigation ex-post to force the renegotiation of the allocation. Hence the allocation from negotiations need not satisfy the additional constraints of ex-post participation. This proposition is obvious when seen in the light of the well understood theoretical insight that the possibility of renegotiation ex-post makes it more difficult to supply incentives ex-ante. Commitment alleviates the tension between ex-ante and ex-post incentives.

3 Endogenous Value Functions

So far I have assumed that value functions are exogenous and constrained them with sufficient conditions that guarantee the existence of litigation in equilibrium. The strength of this approach is that it allows us to be agnostic about the actual game form of litigation. The actual game may be simultaneous or sequential, one shot or staggered over multiple periods. The parties may bear their own costs as is the case under the US fee shifting rules or the court may allocate the costs to the loser as with the English rule. The game may have a unique equilibrium or multiple equilibria. As long as the value functions arising from that game satisfy assumptions (2) and (3), agents would prefer to litigate.

In this section I endogenise the value functions by using a game form that has received considerable attention in this literature namely the Tullock contest.\(^9\) There are two reasons to do this. First, this will show that the result from proposition 1 obtains even with a standard game such as a contest. It is well understood that contests are inefficient since the effort exerted by parties is simply burnt away. Since agents know this they should prefer to settle out of court. However we will find that the result in proposition 1 holds even in the face of this inefficiency. Second, we find that the contest function approach delivers some of the assumptions required for proposition 1 endogenously. In particular we will find that assumption (3) and the assumption about the continuity of the value function in \(q\) are both delivered endogenously when the litigation game is modeled as a Tullock contest.

3.1 Litigation

The court process is modelled as a static contest where parties choose their effort levels simultaneously, and the probability of winning is determined by the

effort $\hat{x}$ exerted by parties. Following are the objective functions of the two agents.

$$\theta_1 E_j \left( P(\hat{x}_1, \hat{x}_j) \right) - \hat{x}_1 \quad \text{and} \quad \theta_j (1 - P(\hat{x}_1, \hat{x}_j)) - \hat{x}_j \quad j \in \{L, H\}$$

where

$$P(\hat{x}_1, \hat{x}_j) = \frac{\alpha \hat{x}_1^{\lambda}}{\alpha \hat{x}_1^{\lambda} + (1 - \alpha) \hat{x}_j^{\lambda}} \quad \lambda, \alpha \in (0, 1). \quad (11)$$

This contest function has certain desirable properties.\(^\text{10}\) The parameters $\alpha$ and $\lambda$ are common knowledge. $\lambda$ captures how sensitive the probability is to the effort exerted by parties. A higher $\lambda$ implies a greater sensitivity of the judicial process to the persuasiveness of lawyers. A judicial process that is less sensitive to the skill of lawyers implies a lower $\lambda$. Alternatively a high responsiveness of the probability of winning to effort could simply mean that it is cheap and easy to bribe judges. In this interpretation $\lambda$ can be thought of as a parameter capturing how corrupt the judiciary is.

The parameter $\alpha$ captures how strong agent 1’s case is ex-ante relative to agent 2. This parameter is introduced to capture the fact that legal disputes may be skewed towards one side.\(^\text{11}\) It is rarely the case that both sides to a dispute have equally strong legal positions. An $\alpha$ equal to 1 implies that agent 1 is certain to win the case; that the case is ‘open and shut’. Note that in the two corner cases of $\alpha \in \{0, 1\}$, the efforts of parties will not play a role as the probability of winning would be insensitive to effort since there is complete certainty about how the court will rule. In this case litigation will be always be avoided. For intermediate values of $\alpha$, the efforts of parties would influence the probability of winning.

Recall that $q$ is the posterior belief of agent 1 at stage 3. Using this belief and the contest function specified in equation (11) it is possible to solve out for

\(^{10}\)Skaperdas (1996) provides the axiomatic foundations of this contest function for the case of $\alpha = \frac{1}{2}$. Clark and Riis (1998) generalise this to the case where $\alpha$ takes any value between zero and one. This contest function is unique in that the winning probability depends on the ratio of equilibrium efforts. It differs from the exponential contest function where the winning probability depends on the difference of the efforts exerted by parties. This function is easily parameterised, and allows a closed form characterisation of the value functions for both agents. $\lambda < 1$ implies concavity and ensures the uniqueness of equilibrium.

\(^{11}\)For a discussion on the interpretation of $\alpha$ in a legal context, see Hirshleifer and Osborne (2001) and Skaperdas and Vaidya (2009).
the Bayesian Nash equilibrium effort levels $x_1$ and $x_j$. These are

$$x_1 = \arg\max_{\hat{x}_1 \geq 0} \left( \theta_1 \left( \frac{q}{\hat{x}_1^\lambda + (1 - \alpha)x_H^\lambda} + (1 - q) \frac{\alpha\hat{x}_1^\lambda}{\alpha\hat{x}_1^\lambda + (1 - \alpha)x_L^\lambda} \right) - \hat{x}_1 \right),$$

(12)

and

$$x_j = \arg\max_{\hat{x}_j \geq 0} \left( \frac{(1 - \alpha)x_j^\lambda}{\alpha\hat{x}_1^\lambda + (1 - \alpha)x_j^\lambda} - \hat{x}_j \right).$$

(13)

To simplify things further, in the rest of the paper I make the following assumption

**Assumption 4.**

$$\theta_L = 0.$$  

(14)

This implies that $x_L(q) = v_L(q) = 0$ for all $q$. To avoid the issue of nonexistence of equilibrium in the limit when $q \to 0$, since this implies $x_1 = x_L = 0$, I assume that in this corner case agent 1 wins the contest with certainty. This assumption simplifies the analysis but is otherwise innocuous since it is possible to show that $\theta_1$ is the limit of $v_1(q)$ as $q$ goes to zero when $\theta_L = 0$. The only way to ensure this is by setting the probability of agent 1 acquiring the surplus to 1 in this corner case. An alternative way to establish the results in this section is to assume that $\theta_L > 0$. This leads to positive effort levels for two players for both realizations of agent 2 type. All results go through mutatis mutandis when the $\theta_L$ is small relative to $\theta_H$ and $\theta_1$. Solving for $x_1$ and $x_H$ and plugging them back into the objective functions for the two agents we find

$$v_1(q) = \theta_1 q \frac{\alpha(q\theta_1)^\lambda}{\alpha(q\theta_1)^\lambda + (1 - \alpha)\theta_H^\lambda} \left( 1 - \lambda \frac{(1 - \alpha)\theta_H^\lambda}{\alpha(q\theta_1)^\lambda + (1 - \alpha)\theta_H^\lambda} \right) + \theta_1 (1 - q)$$

(15)

and

$$v_H(q) = \theta_H \frac{(1 - \alpha)\theta_H^\lambda}{\alpha(q\theta_1)^\lambda + (1 - \alpha)\theta_H^\lambda} \left( 1 - \lambda \frac{\alpha(q\theta_1)^\lambda}{\alpha(q\theta_1)^\lambda + (1 - \alpha)\theta_H^\lambda} \right).$$

(16)

Note that these value functions are continuous in $q$ which was one of the conditions required for the result in proposition 1.
3.2 Ex-Post Participation and Incentive Compatibility

In the general setting lemma 1 shows that assumption (2) requires the surplus to be allocated to agent 1 if the ex-post constraints are to be satisfied. We need the parametric conditions that guarantee the analogue of assumption (2) when the value functions arise from a Tullock contest. Lemma 2 will show that equation (17) is that analogue. When this equation holds incentive compatibility will imply that the transfer to agent 2 must be independent of his type.

\[
\frac{\theta_1 - \theta_H}{\theta_1 + \theta_H} > \lambda \frac{(1 - \alpha)\theta_H^\lambda}{\alpha \theta_1^\lambda + (1 - \alpha)\theta_H^\lambda}
\] (17)

**Lemma 2.** If equation (17) is satisfied then the surplus must always be allocated to agent 1, and the transfer to agent 2 must be constant in his declaration.

**Proof.** We can check from equations (15) and (16) that

\[
\frac{\partial v_H(q)}{\partial q} < 0 \quad \text{and} \quad \frac{\partial v_1(q)}{\partial q} < 0.
\] (18)

Hence \( v_1(1) + v_H(1) > \theta_H \) implies \( v_1(q) + v_H(q) > \theta_H \ \forall q \in [0, 1] \). Let \( \frac{\alpha \theta_1^\lambda}{\alpha \theta_1^{\lambda + (1 - \alpha)\theta_H^\lambda}} = \dot{\alpha} \). Substituting \( q = 1 \) and rearranging we find

\[
v_1(1) + v_H(1) > \theta_H
\]

\[
\theta_1 \dot{\alpha}(1 - \lambda(1 - \dot{\alpha})) + \theta_H(1 - \dot{\alpha})(1 - \lambda \dot{\alpha}) > \theta_H
\]

\[
(\theta_1 - \theta_H)\dot{\alpha} - (\theta_1 + \theta_H)\lambda \dot{\alpha}(1 - \dot{\alpha}) > 0
\]

\[
\frac{\theta_1 - \theta_H}{\theta_1 + \theta_H} > \lambda(1 - \dot{\alpha}).
\] (19)

The last term is equivalent to equation (17). This implies that under equation (17) the second part of the ex-post constraints from equation (4) can never be satisfied and hence the surplus must be allocated to agent 1, that is \( \delta_H = \delta_L = 0 \). Substituting into the incentive constraints in equation (5) this implies \( t_H = t_L \).

3.3 Result

We are now ready to prove the analogue of proposition 1 for the special case when the litigation game is modeled as a Tullock contest.
Proposition 3. Assuming equation (17) holds, there exists a $q^*$ such that for $q_H < q^*$ no implementable allocation exists that yields a payoff at least as high as the payoff from litigation for the two agents.

Proof. First note that lemma 2 shows that when when assumption (17) holds, for an allocation to satisfy the ex-post participation constraints, the surplus must be allocated to agent 1, and the transfer to agent 2 must be constant in his declaration. Let us call this transfer $t = t_H = t_L$. Since $v_L = 0$, this must satisfy
\[ t \geq v_H(q_H) \] (20)
to ensure that agent 2’s ex-post participation constraint is satisfied. Similarly we need agent 1’s allocation to satisfy her interim participation constraint. That is
\[ \theta_1 - t \geq v_1(q_H) \] (21)
However
\[ v_1(1) = \theta_1 \] (22)
and
\[ v_H(1) = \theta_H - \frac{(1 - \alpha)\theta_H^\lambda}{\alpha(\theta_1)^\lambda + (1 - \alpha)\theta_H^\lambda} \left( 1 - \lambda \frac{\alpha(\theta_1)^\lambda}{\alpha(\theta_1)^\lambda + (1 - \alpha)(\theta_H)^\lambda} \right) > 0. \] (23)

Since the value functions are continuous in $q$ there exists a $q^*$ such that for $q_H < q^*$
\[ v_1(q_H) + v_H(q_H) > \theta_1. \] (24)
Since $t \geq v_H(q_H)$, no $t$ exists that can simultaneously satisfy constraints in equations (20) and (21). Consequently no implementable allocation exists that yields a payoff that is at least as high as the payoff from litigation for both parties. 

To generate the result in proposition 1 we assumea that the value functions were continuous in $q$. We can see from equations (15) and (16) that the value functions arising here deliver this assumption endogenously. Furthermore the value functions here also deliver assumption (3) endogenously.

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4 Discussion

In section 4.1, I discuss the possibility of partial commitment to the negotiation allocations. In section 4.2, I discuss some testable implications and applications of the theory presented in the paper.

4.1 Litigation Under Partial Waiver

Consider the following ‘no litigation’ clause that parties contract on at the start of pre trial negotiations, “We agree to accept the allocations that the mechanism specifies. If one of us challenges the allocation ex-post in court, then that party must pay a large fine.” Proposition 2 shows that in this setting, if such a clause is upheld by courts with probability one, then litigation will not arise.

This raises the question of whether litigation would arise if a limited ability to contract away their right to litigate was available to agents; in other words if courts upheld a ‘no litigation’ clause with a probability between zero and one. The degree of commitment available to parties can be thought of as a point in a continuum that is bounded by full contractibility on one end and complete non-contractibility on the other. A natural way to capture the partial commitment in the contest function specified in (11) is through $\alpha$. Once agents sign a contract to stick to the allocations specified by the mechanism, it affects $\alpha$ when the case reaches court ex-post. In a world with complete contractibility, when agent 1 considers approaching the court ex-post, she would find that $\alpha$ equals zero. This means that agents would know that approaching the court in violation of the commitment to stay out of court would invite a certain ruling in favour of the opponent. The world with imperfect commitment would be one where the value of $\alpha$ would change but the change would still not be sufficient to bring about complete certainty about the outcome of the case, that is, $\alpha$ ex-post would still be between zero and one. Consequently the result presented here would be preserved.

One practical problem that a party may face while trying to enforce the allocations of a mechanism is the fact that these allocations may not be observable to the court. If negotiations are conducted privately between parties then this may disable courts from observing the final allocations.\footnote{One may argue that parties may choose to negotiate publicly in order to avoid this problem. However it is often seen that parties find it undesirable to negotiate publicly for a variety of other reasons such as protection of trade secrets in the case of intellectual property, safeguarding the privacy of children in the case of custody battles, etc.} If parties believe
that a ‘no litigation’ clause cannot be enforced due to informational reasons or will not be enforced for legal reasons, then parties find themselves in a situation where it is best for both parties to renegotiate. The issue of whether rational parties can contract away the possibility of ex-post renegotiation has been extensively debated in Maskin and Tirole (1999) and Hart and Moore (1999) in the context of incomplete contracts. The issues arising from the possibility of contracting away the right to renegotiate are similar to ones that are salient in this setting. If the ability to contract away the right to litigate is limited then it follows a fortiori that the ability to avoid ex-post renegotiation is also limited since in the first case the clause rests on the action of litigation which is easily verifiable.

The area of law that governs the right of parties to contract away their rights, in this case the right to judicial remedy, is called waiver. Whether such a waiver is valid is in itself a contentious issue in law. Among other things, the court would verify whether “functional equivalence”, that is some other form of judicial process was available to the agents. If the mechanism for resolving disputes looks fairly close to a judicial process, then a court is more likely to uphold the allocations. For example, arbitral awards in most jurisdictions are open to appeal only on very limited grounds. The inefficiency of arbitration however is qualitatively similar to that of a court since the technology of decision making resembles a contest in both cases. This model does not explain why parties choose arbitration or litigation but provides an explanation for why agents are unable to negotiate costlessly when their outside options arise from costly games such as arbitration and litigation. As long as the outside options of both agents are affected by the beliefs of agent 1 about agent 2’s type, through for example the choice of equilibrium effort levels in the litigation or arbitration game, the inefficiency modeled here would arise.

Why don’t the courts enforce waiver clauses if they enhance efficiency? Apart from obvious behavioural and public policy arguments there may also be convincing efficiency arguments for non-enforcement of waiver clauses in contracts. Anderlini et al. (2011) argue that by committing to void certain contracts the court increases ex-ante efficiency. It is possible that similar considerations induce judges to void contracts where agents contract away their right to litigate. By ensuring costly settlement of disputes courts could dis-incentivise behaviour that leads to disputes arising. This model only shows that conditional on a

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13See Fairness, Flexibility, and the Waiver of Remedial Rights by Contract (1978) for a discussion on how courts treat waiver of judicial remedy.
dispute already having arisen it is efficient for courts to enforce waiver clauses.

4.2 Applications

In this section I discuss the application of the model to different kinds of conflict. I argue that the model sheds some light on the forces at work that prevent agents from effectively avoiding conflict. I also bring out some testable implications and discuss evidence that seems to be consistent with the predictions of the model.

4.2.1 Intellectual Property Litigation

In this model, litigation arises due to the unobservability of valuations. The model therefore predicts that the incidence of litigation should be negatively correlated with the degree of observability of valuations. This implies that more litigation should be observed in sectors where disputes are about objects over which agents are likely to have private valuation. In relation to patents this would imply more litigation in sectors where expected profits from a patent are unlikely to be publicly known.

A related prediction regarding the incidence of litigation is that the rate of litigation should be positively correlated with the range of the distribution of valuation. In section 3 we saw how litigation arises only when the difference between each of $\theta_1, \theta_H,$ and $\theta_L$ is within the right magnitude. Depending on the use of the patent, firms are likely to have different valuations of the patent. Under the assumption that the range of valuations increases with the possible uses a patent has, it is possible to empirically test the relationship between the scope of a patent and the incidence of litigation.

Lerner (1994) uses a data set where an index for the scope of a patent is constructed. Lanjouw and Schankerman (2004) studies the determinants of patent suits using data from the US patent office, the federal courts and industry sources where they have measures for the market value of the patent. Together, these data could be used to test the theory presented here. If the theory is correct, we would expect to find a positive correlation between the scope of a patent and the incidence of litigation even after controlling for things such as the market value of the patent.

Another testable implication about the incidence of litigation arises directly from equation (17). This equation is more easily satisfied when the case is biased in favour of one of the two parties, that is, the value of $\alpha$ is close to 0 or 1. This
is because equilibrium efforts are lower when $\alpha$ is close to 0 or 1. This implies that litigation is more likely when $\alpha$ is close to 0 or 1. The intuition for this is that if facts and law in a given case are heavily loaded in favour of one of the parties, then parties spend less in court because the marginal impact of effort on the probability of winning is lower. This makes litigation less inefficient and consequently more likely.

4.2.2 War

Fearon (1995) argues that miscalculation of the opponent’s willingness to fight is one of the causes of war. While discussing the incentives of states to reveal their true willingness to fight he states:

“While states have an incentive to avoid the costs of war, they also wish to obtain a favourable resolution of the issues. This latter desire can give them an incentive to exaggerate their true willingness or capability to fight, . . . if they are concerned that revelation would make them militarily (and hence politically) vulnerable . . . ”

The model presented here supplies the micro-foundations for this idea. Here the willingness to fight is determined by the valuation parties place on the subject matter in dispute. A low valuation agent takes into account the ex-post incentive of the opponent to threaten litigation once she finds out that he has low valuation. This vulnerability created by truthful revelation destroys the incentives for truthfully declaring one's valuation.

A historical example that seems to fit the argument formalised in this model is the Russo-Japanese conflict of 1904-05 over Korea and Manchuria. A significant ingredient that led to the conflict was the desire for exclusive economic control over Korea and Manchuria, given the investment both nations had made in these regions (See White (1964)). For instance, in early 1903 the Russians started lobbying for rights to construct a railway line between Seoul and Uiju. The Japanese, being in the process of constructing a line between Seoul and Fusan, were opposed to this. In Manchuria, Russia wanted exclusive control to protect the large investments in the Chinese-Eastern railway that was to facilitate transit of goods from ports on the Pacific Ocean into Russia. Furthermore the Russians were planning to build a port in Dahny for getting access to sea for the Chinese-Eastern Railway. The Japanese who controlled the port of Nuchuang were worried about the loss of trade resulting from the construction of a rival port.
There were several negotiations between the two countries in the time leading to the conflict. The first communication happened in 1901 in the aftermath of the Boxer Rebellion which presented the Russians with an opportunity to increase their influence over Manchuria. In early 1901 the Russians entered into an agreement with China that consolidated their power in Manchuria. Historical accounts indicate that the Japanese were strongly opposed to this agreement but the Russians failed to take this into account, believing that the Japanese would never go to war against a strong western power.\(^{14}\)

In late 1901, Ito Hirobumi, a Japanese minister, travelled to Russia. Accounts of his negotiations indicate how he attempted to convey to the Russians the Japanese desire for exclusive control over Korea. The Russians however were only willing to make concessions to the extent of sharing control over Korea. This position continued in the final negotiations in December of 1903 when the Russians refused to accede to the Japanese demand for a neutral zone on the banks of the Yalu river in Korea. Furthermore the Russians refused to discuss the issue of Manchuria and maintained their stand that the Manchurian issue was not on the table.

These accounts indicate that both the Russians and the Japanese valued the control rights over Manchuria and Korea. Furthermore, the Russians believed that the Japanese declarations before the war were cheap talk. This example fits well with the idea that the incentives of parties to always overstate their willingness to fight creates an informational asymmetry that can lead to conflict. The opponent disbelieves any declaration about the willingness to fight and consequently agents with genuinely high valuation are left with no option but to fight.

5 Conclusion

This paper has attempted to offer a solution to the puzzle of existence of conflict between rational agents. Rational explanations of conflict are based on the existence of informational asymmetry between agents. This informational asymmetry is preserved by restricting communication between parties in some way. The model presented here tries to establish the existence of conflict in a setting where communication between parties is not restricted. In doing so this

\(^{14}\)See Nish (1985) for a rich account of the negotiations between Russia and Japan preceding the conflict.
paper has attempted to solve two longstanding problems in the literature on why people litigate.

The first problem tackled here is the problem of microfounding the presence of litigation through the existence of private information in a way that is consistent with full disclosure theorems. The model proposed here allows all certifiable information to be disclosed at the pre-trial stage. Private information that creates informational asymmetries between parties is purely of the non-certifiable kind, which is modelled as the valuation that parties place on the subject matter in dispute. This influences the amount spent in court which consequently influences the expected payoff from litigation thereby making it unobservable.

The second problem that this paper tackles is the restriction that the literature has placed on the pre-trial interaction between parties. The literature so far has assumed that parties can only interact in a bargaining framework where communication is limited to offers and counteroffers. By studying negotiations in a framework of mechanism design, this paper allows for richer communication between parties.

The paper uses the theoretical insight that requiring the ex-post participation constraints to be satisfied, can significantly reduce the set of implementable allocations. I find that this is especially the case when the outside options vary with the belief of the uninformed agent about the type of her opponent. Using these two ingredients I show a new inefficiency result emerges that resembles the breakdown in negotiations leading up to litigation. I have argued that this insight crosses over to other types of costly conflict where agents can quit negotiations unilaterally.

In further work it may be interesting to develop a normative theory of the judiciary that seeks to explain how a seemingly inefficient judiciary may be globally optimal. Perhaps the possibility of inefficient litigation ex-post may create incentives for efficient behaviour ex-ante. This ties back to the conception of courts in neo-classical economics with a slight twist: courts deter undesirable behaviour by ensuring that parties cannot efficiently negotiate themselves out of disputes once they arise.

References

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*Fairness, Flexibility, and the Waiver of Remedial Rights by Contract*

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