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The Effect of Malice on Retainers and Pleading Choices

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Abstract In a standard model of nuisance lawsuits, we consider a plaintiff who obtains malice utility from the loss of a defendant. Confirming our intuitions from casual observations in reality, we find that a more malicious plaintiff is more likely to file a nuisance suit in equilibrium. We also find that the plaintiff's equilibrium filing cost decreases in malice whereas the equilibrium answering cost and settlement value do not depend on malice. When we allow the defendant to pay a retainer before the plaintiff's filing decision, we find that the defendant is willing to use the retainer option as long as it is not too costly. Thus, the retainer option is effective in

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deterring a nuisance lawsuit, although the defendant must spend a larger retainer as the plaintiff becomes more malicious.

Keywords nuisance lawsuit · malicious lawsuit · retainer · filing cost · answering cost · settlement

Introduction

In 2014, the Ontario Supreme Court of Justice in Canada awarded damages to Plaintiff Denis Drainville in a malicious prosecution case, in which Defendant Mario Vilchez was found to bring a false accusation against Drainville out of malicious intent.[1] Such an event, in which an individual sues someone out of malicious intent, is not rare in reality: many individuals sue others for personal vengeance, corrupted public officials bring charges against citizens to calm their voices, and so forth. Malicious lawsuits are especially problematic in a civil suit, because courts often impose liability or punishment on the party which initiated a lawsuit out of malice in a criminal case but they rarely do so in a civil case. Despite the fact that an individual's malice is an important factor behind many lawsuits, the effects of malice on legal outcomes are not well studied. We attempt to fill the gap in this paper.

More precisely, in a standard model of nuisance suits developed by Hubbard (2016), we introduce a malice parameter and study how it affects the equilibrium outcomes of the model.[2] In the basic model, confirming our intuitions from casual observations in reality, we found that malice tends to increase the frequency of nuisance lawsuits. As we assume complete information in our model, all cases filed at the court are eventually settled. Thus, a malicious plaintiff in our model sues a defendant in order to obtain a surplus from settlement. We also found that malice reduces a plaintiff's filing cost but does not affect the equilibrium settlement value and a defendant's answering cost.

We then extend our basic model to allow a defendant to pay a retainer before a case is filed. In this case, we found that a defendant is willing to utilize the retainer option to deter a plaintiff from filing a nuisance lawsuit as long as it is not too costly. As many legal scholars agree that a nuisance suit should not be brought to courts, an expansion of the retainer option for defendants could be one policy response in a society plagued with malicious lawsuits. We also found that a defendant should pay a larger retainer when dealing with a more malicious plaintiff.

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[1] Drainville v. Vilchez, 2014 ONSC 4060 (CanLII). The two men met at a gas station, at which Vilchez was refueling the pumps. He set up a few cones nearby to deter drivers from entering the area, but they were not set up properly. Without noticing the cones, Drainville drove into the area and the two men got into quarrelling. Vilchez reported to the police that Drainville hit him when driving into the gas station, which initiated a criminal prosecution.

[2] A nuisance lawsuit is a suit in which a plaintiff's expected payoff at trial is negative. Therefore, many commentators and legal scholars thought that such suits are normally not brought to the court, which is in contrast to casual observations in reality. Rosenberg and Shavell (1985) proposed the first model to study the existence of such lawsuits. Also see, among others, Bebchuk (1988,1996), Katz (1990), Miceli (1993), Klement (2003), Chen (2006), Rosenberg and Shavell (2006), and Schwartz and Wickelgren (2009).

We are not the first to introduce the concept of malice in the literature. Guha (2016) first considered a malice parameter in a model of settlement bargaining and studied its effects in the model. However, she did not consider legal decisions such as filing and retainer decisions which we studied in our model. The effect of malice is also studied in other contexts such as Rubinstein bargaining problems and pretrial negotiations (see Guha (2018, 2019)), but there are still many aspects of legal procedures that need close investigation in a model with malice.

In general, we contribute to the large literature on litigation models in law and economics. There are many research papers investigating various aspects of litigation such as judgment-proof problems (see, e.g., Shavell (2005) and Kim and Koh (2019)), court-appointed expert problems (see, e.g., Kim and Yoon (2019) and Kim and Koh (2020)), and other issues in litigation processes (see, e.g., Kim (2017a, 2017b, 2018)). We contribute to this literature by investigating the effects of malice on important equilibrium outcomes in a litigation model.

Recently, economists have studied to what extent an individual's ill will influence his/her decision making, especially in the area of behavioral economics and experimental economics.[3] For instance, Abbink and Herrmann (2011) found that many participants incurred costs to destruct payoffs of others in an experiment. See also Zizzo and Oswald (2001), Zizzo (2003), and Abbink and Sadrieh (2009) for related studies. In light of this literature, we provide a behavioral model of litigation incorporating an individual's malice to understand the ways in which such a behavioral component affects equilibrium outcomes in a standard model in the law and economics literature.[4]

This paper is organized as follows. Section 2.1 describes our basic model, Section 2.2 provides the analysis of the model, and Section 2.3 shows our analysis of a model with a retainer option for a defendant. Section 3 concludes.

Analysis

The Basic Model

In this section, based on the model of Hubbard (2016), we introduce the basic model we analyze in this paper, which will be subsequently extended to incorporate various procedures in the legal dispute. In our model, *P* (she) represents a plaintiff and *D* (he) represents a defendant. *J* is the amount of judgment at stake, so the defendant must give *J* to the plaintiff if the defendant loses at trial. In addition to the judgment he must pay, the defendant also suffers a loss of *E* upon losing at trial, where the variable captures a reputation loss or stress factors. When the parties move to trial, one of them wins with certain probabilities: π is the plaintiff's winning probability at trial, where $\pi \in [0, 1]$. C_i is party *i*'s total cost of litigation where *i* is either *P* or *D*, which is fully paid when they reach at the trial stage.

[3] There is a growing literature that incorporates behavioral components to models in law and economics. For a recent reference, see for example Deffains and Fluet (2013) and Kim et al. (2018).

[4] Law and economics scholars have adopted experimental methodologies to expand their understanding of legal institutions. For instance, see Kim and Kim (2018).

We assume that parties may choose to spend a part of their litigation costs before they reach at the trial stage. To be more precise, when initiating a suit, the plaintiff can choose how much cost to incur in filing a suit, $F \geq 0$. For instance, the plaintiff needs to develop and present her case in detail to the court, which she can do in the filing stage or in a later stage of litigation. This implies that the filing cost cannot exceed the total litigation cost of the plaintiff, $F \leq C_P$, and therefore what the plaintiff must choose here is to shift a part of the total litigation cost to an early stage (i.e., by choosing a high value of *F*) or to a later stage (i.e., by choosing a low value of *F*) of the legal battle.

After the suit is filed by the plaintiff, the defendant must prepare and present a legal answer to the court, and the defendant can choose how much cost to spend in this answering stage, $A \geq 0$. If the defendant does not provide a detailed answer at this stage, he must do that in a later stage anyway, and therefore the defendant can choose to shift a part of the total litigation cost to an early stage (i.e., by choosing a high value of *A*) or to a later stage (i.e., by choosing a low value of *A*) of the legal battle. This implies that the answering cost cannot exceed the total litigation cost of the defendant, $A \leq C_D$. We emphasize that these costs borne at this early stage of litigation become a sunk cost to parties in a later stage of the suit, because once spent, these costs cannot be recouped. This feature of filing and answering decisions will play a crucial role in our analysis.[5]

Once the defendant delivers his answer to the court, one of the parties will be chosen to make a take-it-or-leave-it settlement offer *S* to the other party. In particular, the plaintiff will be able to make such an offer with probability $\alpha \in [0, 1]$ and the defendant with the remaining probability. We can interpret these probabilities as representing the bargaining power of the litigants: as the plaintiff possesses a stronger bargaining power, she has a higher chance of having her demand go through the negotiation process and vice versa.

Our innovation in this paper is, following the idea of Guha (2016), the introduction of a malicious utility parameter, $\mu > 0$, to the model of Hubbard (2016).[6] We assume that if the plaintiff is malicious, she obtains utility from the loss of the defendant in the litigation process. Indeed, there are many instances in reality in which a party sues another out of malicious intent: for instance, an individual may want to harass another for personal reasons or a corporation may want to intimidate consumers to deter them from presenting a class action.[7] To be precise, we assume that the plaintiff obtains utility μ for each unit of loss borne by the defendant. For instance, if the defendant incurs a litigation cost of 10, the plaintiff obtains a positive payoff of $\mu \times 10$. Our aim in this paper is to study the effect of the plaintiff's malice on the litigation process: does the plaintiff want to bring a nuisance suit more often as her malicious intent gets stronger? How does malice affect the settlement behaviors of the parties? We ask these questions in the following analysis.

As our model of litigation is a dynamic game with complete information, a suitable solution concept is a subgame perfect equilibrium (referred to as an equilibrium throughout the paper),

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[5] Following Hubbard (2016), we assume the levels of filing and answering costs are observable.

[6] Following Guha (2016), we assume the level of malice is observable.

[7] A class action is a lawsuit in which a party is composed of many individuals. An example is a class action presented by consumers against a corporation for a product liability. See, for example, Mackaay (2018) for a discussion about this topic in the framework of law and economics.

which can be found using backward induction.

Analysis of the Basic Model

As our focus is the case of nuisance suits, we assume that the plaintiff's "expected revenue" at trial is less than her total litigation cost:

$$\pi(J + \underbrace{\mu(J+E)}_{(*)}) + \underbrace{\mu C_D}_{(**)} < C_P \tag{1}$$

where $(*)$ and $(**)$ represent the plaintiff's utility gain from the defendant's loss at trial.[8] This condition naturally imposes a upper bound on the plaintiff's malice parameter:

$$\mu < \frac{C_p - \pi J}{\pi(J+E) + C_D} \equiv \overline{\mu}$$

That is, in our analysis, we consider a plaintiff with relatively weak malicious intent. Thus, our group of malicious plaintiffs under investigation in our paper includes a perfectly rational plaintiff in the extant literature as a special example with no malicious intent.

Using backward induction to find the equilibrium, we first investigate the final decisions of parties in our model, i.e., their settlement offer decisions. At this stage of litigation, the defendant's expected payoff from moving to trial is $-h \equiv -\pi(J+E) - (C_D - A)$. It is important to notice that we subtract the answering cost A from the defendant's cost, because the answering cost is a sunk cost at this stage and therefore should not matter in decision making problems of the parties. Thus, anticipating this, the plaintiff demands h for settlement if she is chosen to make the offer, and the defendant will accept this deal.[9]

To calculate the defendant's settlement offer, observe that if the case goes to trial, the plaintiff obtains $k \equiv \pi(J+\mu(J+E)) + \mu(C_D - A) - (C_P - F)$ where we subtract the answering cost A and the filing cost F because they are sunk costs and already born by the parties at this point. On the other hand, if the plaintiff withdraws at this point, she obtains 0. Thus, if $k < 0$, the plaintiff has no incentive to move to trial, and therefore, anticipating this, the defendant has no reason to offer a positive amount of settlement. Therefore, the following condition must hold for the defendant to offer a positive amount at the settlement stage:

$$k = \pi(J+\mu(J+E)) + \mu(C_D - A) - (C_P - F) \geq 0 \tag{2}$$

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[8] Upon losing at trial, the defendant (i) pays *J* to the plaintiff and (ii) suffers *E*. In addition, regardless of the final verdict, the defendant (iii) incurs a total litigation cost C_D at trial. The plaintiff obtains a malice utility from these three factors.

[9] For expositional simplicity, we assume that a party chooses to settle if he/she is indifferent between settlement and trial. This assumption does not change the qualitative result and is widely used in a model incorporating a settlement stage. See Daughety and Reinganum (2012) for a comprehensive review of settlement models.

In this case, if the defendant is chosen to make a settlement offer, he needs to offer at least $k/(1+\mu)$ to deter the plaintiff from moving to trial.[10] Thus, the defendant's settlement offer can be succinctly written as follows:

$$\frac{1}{1+\mu}\max\{0, \pi(J+\mu(J+E))+\mu(C_D-A)-C_P+F\}$$

Therefore, taking into account the parties' bargaining power, we obtain the following lemma showing the expected settlement offer.

Lemma 1. The expected settlement offer is given by the following formula:

$$\hat{S}=\alpha(\pi(J+E)+C_D-A)+(1-\alpha)\frac{1}{1+\mu}\max\{0, \pi(J+\mu(J+E))+\mu(C_D-A)-C_P+F\}$$

Using backward induction, we now consider the defendant's decision making problem of choosing the answering cost A. As the defendant expects to settle at $\hat{S}$, his expected payoff is given by the following formula:

$$-\hat{S}-A=-\alpha(\pi(J+E)+C_D)-(1-\alpha)\left(\frac{1}{1+\mu}\max\left\{0, \underbrace{\pi(J+\mu(\mathrm{J}+E))+\mu(C_D-A)-C_P+F}_{(*)}\right\}+\mathrm{A}\right)$$

where we suppress the dependence of $\hat{S}$ on F and A for notational simplicity. Therefore, we can write the defendant's problem as follows:

$$\max_A -\hat{S}-A$$

We need to consider two cases separately. First, if $(*)\leq 0$, the defendant's expected payoff is given by

$$-\alpha(\pi(J+E)+C_D)-(1-\alpha)A$$

which is decreasing in A. Second, if $(*)>0$, the defendant's expected payoff is given by

[10] If the defendant offers $k/(1+\mu)$, the plaintiff obtains a payoff of $\frac{k}{1+\mu}+\mu\frac{k}{1+\mu}=k$, where the second term represents the plaintiff's malice utility from the defendant's expenditure for settlement.

$$-\alpha(\pi(J+E)+C_D)-(1-\alpha)\left[\pi J+\frac{\mu}{1+\mu}(\pi E+C_D)-\frac{C_P-F}{1+\mu}+\frac{1}{1+\mu}\mathrm{A}\right]$$

which is also decreasing in A. Thus, the optimal answering cost for the defendant is $A^* = 0$.

Lemma 2. The optimal answering cost for the defendant is equal to 0: $A^* = 0$.

Finally, using backward induction, we consider the plaintiff's problem of choosing the filing cost in the beginning of the litigation process. If the plaintiff's choice of F is such that the condition (2) does not hold, the plaintiff's threat of moving to trial is not credible at the settlement stage, and therefore the plaintiff cannot extract any surplus from settlement and she must eventually withdraw the suit. In such a situation, the plaintiff would have just wasted her filing cost for nothing. This implies that if the plaintiff were to choose any positive value of F, it must be such that the condition (2) is satisfied. Thus, using the condition (2) and $A^* = 0$, we can find the lower bound for F:

$$F \geq C_P - (1+\mu)\pi J - \mu(\pi E + C_D)$$

This inequality tells us that the plaintiff needs to shift an enough amount of litigation costs to an early stage of litigation in order to have a credible threat of rejecting settlement and going to trial, thereby extracting a positive amount of surplus from the defendant. Otherwise, when a large portion of cost still needs to be incurred for pursuing trial at the settlement stage, the plaintiff's expected payoff from moving to trial is negative at that point, and therefore the defendant has no incentive to cede any amount through settlement, anticipating the plaintiff to withdraw.

With a credible threat to go to trial, the plaintiff anticipates settlement with $\hat{S}$. Therefore, the plaintiff's expected payoff at the filing stage is given by

$$\begin{aligned}
&(1+\mu)\hat{S}+\mu A-F \\
&\quad=(1+\mu)\alpha(\pi J+\pi E+C_D-A) \\
&\quad+(1-\alpha)[(1+\mu)\pi J+\mu\pi E+\mu(C_D-A)-C_P+F]+\mu A-F \\
&\quad=\alpha[(1+\mu)(\pi J+\pi E+C_D-A)-F] \\
&\quad+(1-\alpha)[(1+\mu)\pi J+\mu\pi E+\mu(C_D-A)-C_P]+\mu A
\end{aligned}$$

which implies that the plaintiff's problem is given as

$$\max_F (1+\mu)\hat{S}+\mu A-F \quad subject\ to \quad F \geq C_P-(1+\mu)\pi J-\mu(\pi E+C_D)$$

It is straightforward to verify that the objective function is decreasing in F. Therefore, the plaintiff seeks to choose the minimum F which is consistent with a credible threat of trial.

This implies that the equilibrium filing cost of the plaintiff is $F^* = C_P - (1+\mu)\pi J - \mu(\pi E + C_D)$. Using F^* and A^*, the equilibrium expected settlement can be calculated to be $S^* = \alpha(\pi J + \pi E + C_D)$. These findings give us our first main finding.

Proposition 1. The equilibrium of our model can be summarized by the following quantities:

$$F^* = C_P - (1+\mu)\pi J - \mu(\pi E + C_D)$$
$$A^* = 0$$
$$S^* = \alpha(\pi J + \pi E + C_D)$$

It is interesting to find that the malice parameter affects only the equilibrium filing cost, without influencing the equilibrium answering cost and settlement offer. In particular, the equilibrium filing cost is decreasing in malice: that is, a more malicious plaintiff is shifting a smaller amount of litigation costs to the filing stage. Intuitively, this is because a low level of filing cost is enough for the plaintiff to maintain a credible threat of trial with help of her malice utility obtained at trial.

Malice does not affect the equilibrium settlement offer because there are two opposing effects. Consider the defendant's point of view. On one hand, the defendant needs to increase his offer to compensate the plaintiff's malice utility (which would have been realized if the case were to go to trial). On the other hand, malice operates as a "discounting factor" in our model: to offer 1 unit of payoff to the plaintiff, it is enough for the defendant to actually offer $1/(1+\mu)$ dollars because it provides a payoff of $\frac{1}{1+\mu} + \mu\frac{1}{1+\mu} = 1$ to the plaintiff. In our model, these two effects are perfectly balanced, thereby leaving the equilibrium settlement offer unaffected by malice. In a more general environment, we expect that this result might fail to hold. For instance, instead of linearity, if malice utility enters to the model as a concave term, i.e., $\mu(x) = \mu x^{1/2}$, malice could influence the equilibrium settlement offer.

Finally, given the equilibrium quantities, the plaintiff is willing to initiate a lawsuit if her payoff from settlement exceeds the filing cost: $(1+\mu)S^* + \mu A^* > F^*$, or using the equilibrium values,

$$(1+\mu)\alpha(\pi J + \pi E + C_D) - \big(C_P - (1+\mu)\pi J - \mu(\pi E + C_D)\big) > 0 \qquad (3)$$

Thus, we can say that the plaintiff has a "credible threat to sue" the defendant in the first place if the condition (3) is satisfied.

Rearranging this inequality, we can find the lower bound on the plaintiff's malice such that we observe a nuisance lawsuit in our society:

$$\mu > \frac{C_P - (1+\alpha)\pi J - \alpha(\pi E + C_D)}{(1+\alpha)(\pi J + \pi E + C_D)} \equiv \underline{\mu}$$

This inequality suggests that, keeping all other variables constant, we may observe nuisance lawsuits more often in a society with more malicious individuals. This finding confirms our intuition from casual observations in reality, in which one thinks that many lawsuits, seemingly without any material merit for plaintiffs, are nevertheless put forward by malicious intent.

What if the Defendant Can Deter a Nuisance Suit through a Retainer?

In this section, we extend our basic model to incorporate a retainer agreement. The defendant has an option to pay a retainer R before the plaintiff files a suit. This retainer agreement specifies a legal service to be done for the defendant in future. Thus, in our model, a retainer payment is part of the total litigation cost of the defendant, i.e., $R \leq C_D - A$, and is a sunk cost in the process of the lawsuit. Our aim in this subsection is to investigate the effect of such a retainer payment on the equilibrium outcomes and to understand the ways in which malice could interact with a retainer payment.

As to be shown in the following analysis, the primary purpose of paying a retainer is to deter the plaintiff from filing a nuisance suit. In the previous analysis (with $R = 0$), we showed that both parties eventually settle the matter out of the court (if the suit is filed), and anticipating this, the plaintiff files a nuisance suit in order to obtain the surplus from the settlement. One way to avoid such an unfavorable outcome for the defendant is to reduce the surplus from the settlement, and this can be done through a retainer payment. Thus, the first condition for a positive retainer in equilibrium is that it deters a nuisance suit. To be more precise, consider a retainer that cannot deter the plaintiff from filing a nuisance suit. In this case, the defendant's expected payoff can be calculated following the same logic as in the previous analysis: $-\alpha(\pi J + \pi E + C_D) - (1-\alpha)R$ where the defendant's expected payoff decreases in R and therefore the defendant will choose $R = 0$.

The second condition for a positive retainer is that the plaintiff's threat to sue is credible when $R = 0$: if the threat is not credible, the plaintiff will not sue in the first place and therefore there is no need for a positive retainer. Therefore, the condition (3) must hold if we seek to find a positive retainer payment in equilibrium.

If the defendant wants to deter a nuisance suit by paying a retainer, the best choice of retainer would be the minimum amount that makes the plaintiff indifferent between suing (with payoff $(1+\mu)S^* + \mu A^* - F^*$) and not suing (with payoff 0), in which case the plaintiff has no incentive to file a suit. That is, R^* is the solution from the following equation:

$$[(1+\mu)\pi J + \mu(\pi E + C_D - R^*) - C_P] + (1+\mu)\alpha(\pi J + \pi E + C_D - R^*) = 0$$

which, after rearranging, provides us with the optimal choice of retainer for the defendant in the following proposition.

Proposition 2. If the defendant chooses a positive retainer in equilibrium, the equilibrium retainer is given by

$$R^* = \frac{(1+\mu)\pi J + \mu(\pi E + C_D) - C_P + (1+\mu)\alpha(\pi J + \pi E + C_D)}{\mu + (1+\mu)\alpha}$$

in which case, the plaintiff does not file a lawsuit in equilibrium.

Taking derivatives of R^* in the above proposition, we obtain

$$\frac{\partial R^*}{\partial \mu} = \frac{(1+\alpha)(C_P - \pi J)}{(\mu + (1+\mu)\alpha)^2} > 0$$

where the inequality holds because of the condition (1). This implies that when facing a more malicious plaintiff, (assuming $R^* > 0$ in equilibrium) the defendant is willing to *sunk* a larger amount of cost by paying a retainer. A more malicious plaintiff obtains a greater expected payoff from settlement, despite the fact that the equilibrium settlement is unaffected by malice, because her malice utility is increasing. Thus, the plaintiff has higher incentive to file a nuisance suit as her malice parameter increases, thereby increasing the defendant's retainer payment.

If R^* is the equilibrium choice, it must provide the highest payoff for the defendant, i.e., we need to have $R^* \leq S^* = \alpha(\pi J + \pi E + C_D)$. That is, it should be better for the defendant to pay a retainer and deter a suit than (choosing $R = 0$) to let the plaintiff file a suit and settle at S^*. In addition, the retainer payment cannot exceed the total litigation cost, i.e., $R^* \leq C_D - A^* = C_D$, where we have $A^* = 0$ from the previous analysis. These two conditions impose a natural upper bound on the defendant's expenditure for a retainer:

$$R^* \leq \min\{\alpha(\pi J + \pi E + C_D), C_D\}$$

Intuitively, the retainer option is valuable only when it can deter a nuisance suit, and if it is too costly to deter a suit, the defendant will be better off with facing a suit and settling the matter out of the court. Thus, the defendant pays a positive retainer payment R^* in equilibrium and deters the plaintiff from filing a nuisance suit if and only if the conditions (3) and (4) are satisfied. Otherwise, the defendant does not utilize a retainer in equilibrium and we obtain the same equilibrium as in the model without retainers.

Conclusion

In this paper, we studied the effect of malice on equilibrium outcomes in a standard model of a nuisance lawsuit. In particular, we considered a plaintiff who obtains malice utility from the loss of a defendant, and our results confirmed our intuitions from casual observations in reality. First, in our model, the plaintiff's equilibrium filing cost is shown to decrease in his malice, whereas the equilibrium settlement amount and answering cost do not depend on the plaintiff's

malice. We also found that, keeping all variables constant, a higher level of malice enjoyed by the plaintiff increases his chance of bringing a nuisance suit to the court. Second, when we extended our model to incorporate a retainer option for the defendant, we found that the defendant is willing to pay a retainer to deter the plaintiff from filing a nuisance suit as long as the equilibrium retainer is not too large. We also showed that the equilibrium retainer payment increases in malice.

In reality, an individual may obtain a different level of malice utility depending on the identity of his/her opponent in litigation. This implies that malice could have a strong effect in a relationship between two parties from different groups; in other words, malice and out-group bias[11] could interact with each other, thereby deteriorating intergroup relations in many societies. Our result suggests that expanding the retainer option could be effective in deterring nuisance suits, thereby stopping a downward spiral in intergroup relations, in such situations, although retainer payments could be huge when individuals are hostile toward others outside their groups.

An interesting avenue for future work, in relation to out-group bias discussion above, is to consider a situation in which both parties are malicious. In other words, what if the defendant is also malicious in our model? Will we observe more nuisance suits in our society in such a situation? If so, what are the effects of malice on equilibrium outcomes in litigation? Does a retainer option still have a potential in deterring nuisance suits? We leave these topics for future work.

References

Abbink, K. and Herrmann, B. (2011). The Moral Costs of Nastiness, *Economic Inquiry*, 49(2), 631-633.

Abbink, K. and Sadrieh, A. (2009). The Pleasure of Being Nasty, *Economics Letters*, 105(3), 306-308.

Bebchuk, L. (1988). Suing Solely to Extract a Settlement Offer, *Journal of Legal Studies*, 17, 437-450.

Bebchuk, L. (1996). A New Theory Concerning the Credibility and Success of Threats to Sue, *Journal of Legal Studies*, 25, 1-26.

Chen, Z. (2006). Nuisance Suits and Contingent Attorney Fees, *Review of Law and Economics*, 2, 363-370.

Daughety, A. and Reinganum, J. (2012). Settlement, In C. W. Sanchirico (Ed.), *Procedural Law and Economics*, Chapter 15, Edward Elgar Publishing.

Deffains, B. and Fluet, C. (2013). Legal Liability when Individuals Have Moral Concerns, *Journal of Law, Economics and Organization*, 29, 930-955.

Guha, B. (2016). Malicious Litigation, *International Review of Law and Economics*, 47, 24-32.

Guha, B. (2018). Malice in the Rubinstein Bargaining Game, *Mathematical Social Sciences*, 94, 82-86.

Guha, B. (2019). Malice in Pretrial Negotiations, *International Review of Law and Economics*, 58, 25-33.

Hubbard, W. (2016). Sinking Costs to Force or Deter Settlement, *Journal of Law, Economics, and Organization*, 32(3), 545-585.

Katz, A. (1990). The Effect of Frivolous Lawsuits on the Settlement of Litigation, *International Review of Law and Economics*, 10, 3-27.

Kim, C. (2017a). Centralized versus Decentralized Institutions for Expert Testimony, *Journal of Institutional and Theoretical Economics*, 173(2), 209-238.

[11] In an intergroup relation literature, in-group and out-group bias has been extensively studied: an individual tends to show in-group favoritism to others in his/her group (where a group can refer to gender, working class, and so forth) and out-group discrimination to others outside his/her group. For instance, Shayo and Zussman (2011) find robust evidence for in-group bias in the decision of judges in Israeli small claims courts.

Kim, C. (2017b). An Economic Rationale for Dismissing Low-quality Experts in Trial, *Scottish Journal of Political Economy*, 64(5), 445-466.

Kim, C. (2018). Judge's Gate-keeping Power and Deterrence of Negligent Acts: An Economic Analysis of Twombly and Iqbal, *European Journal of Law and Economics*, 46, 39-66.

Kim, C. and Kim. S. (2018). Exoneree Compensation and Endogenous Plea Bargaining: Theory and Experiment, Working Paper.

Kim, C., Kim, S., and Nam, S. (2018). Strict Liability, Settlement, and Moral Concern, *The Korean Journal of Economics*, 25(2), 61-84.

Kim, C. and Koh, P. (2019). Minimum Asset and Liability Insurance Requirements on Judgment-proof Individuals When Harm is Endogenous, *Hitotsubashi Journal of Economics*, 60(2), 141-161.

Kim, C. and Koh, P. (2020). Court-appointed Experts and Accuracy in Adversarial Litigation, *International Journal of Economic Theory*, forthcoming.

Kim, C. and Yoon, C. (2019). Adversarial Bias and Court-Appointed Experts in Litigation, *The Korean Journal of Economics*, 26(1), 105-131.

Klement, A. (2003). Threats to Sue and Cost Divisibility under Asymmetric Information, *International Review of Law and Economics*, 23, 261-272.

Mackaay, E. (2018). Some Law and Economics of the Class Action, Working Paper.

Miceli, T. (1993). Optimal Deterrence of Nuisance Suits by Repeat Defendants, *International Review of Law and Economics*, 13, 135-144.

Rosenberg, D. and Shavell, S. (1985). A Model in which Lawsuits Are Brought for Their Nuisance Value, *International Review of Law and Economics*, 5, 3-13.

Rosenberg, D. and Shavell, S. (2006). A Solution to the Problem of Nuisance Suits: The Option to Have the Court Bar Settlement, *International Review of Law and Economics*, 26, 42-51.

Schwartz, W. and Wickelgren, A. (2009). Advantage Defendant: Why Sinking Litigation Costs Makes Negative-Expected-Value Defenses But Not Negative-Expected-Value Suits Credible, *Journal of Legal Studies*, 38, 235-253.

Shayo, J. and Zussman, A. (2011). Judicial Ingroup Bias in the Shadow of Terrorism, *Quarterly Journal of Economics*, 126(3), 1447-1484.

Shavell, S. (1980). Strict Liability Versus Negligence, *Journal of Legal Studies*, 9, 463-516.

Shavell, S. (2005). Minimum Asset Requirements and Compulsory Liability Insurance as Solutions to the Judgment-proof Problem, *RAND Journal of Economics*, 36(1), 63-77.

Zizzo, D. (2003). Money Burning and Rank Egalitarianism with Random Dictators, *Economics Letters*, 81, 263-266.

Zizzo, D., and Oswald, A. (2001). Are People Willing to Pay to Reduce Others' Incomes?, *Annales d'Economie et de Statistique*, 63, 39-62.