The Effect of Lawyers' Career Concerns on Litigation

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Abstract

This paper studies the effects of lawyers' career concerns on litigation in a model with two lawyers opposing each other in a case. The outcome of the trial depends on the lawyers' talents and choices of effort, and therefore is informative about the lawyers' talents. Career concerns imply that the lawyers' payoff functions are increasing in the market's inference about their talent. As a consequence, they provide an implicit incentive for lawyers to exert higher levels of effort in court, and create strategic interactions between the two. In particular, career concerns create an equilibrium effort trap, which implies larger trial costs and is consistent with empirical findings on lawyers' hours of work. In addition, these results have implications for settlement. First, larger trial costs increase the range for pretrial bargaining. Second, I find that the lawyer with stronger career concerns may end up obtaining a more beneficial settlement agreement.

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Key words: Bayesian updating, effort choice, strategic interactions, settlement.

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1 Introduction

Legal disputes are frequent in a wide variety of economic activities.[1] In particular, litigation expenses may increase the costs of healthcare, the costs of intellectual property protection, and the prices of goods via products liability. Therefore, it is worth examining the incentives behind lawyers' decisions, particularly if those incentives may increase the costs of litigation. Since a lawyer's performance in court provides information about her skills, lawyers with career concerns might try to influence this learning process. Specifically, although winning a case might not imply a large amount of direct earnings at the beginning of a lawyer's career, it could have a substantial impact on her future salary. Thus, the prospect of earnings growth upon winning is an important incentive that might motivate lawyers to exert more effort in court.

Career concerns appear to be particularly relevant in the legal profession because the variance of lawyers' earnings is large (according to Rosen, 1992, the standard deviation is more than 40 percent of the mean). Such large variance is not fully explained by experience, gender, and working hours (again, see Rosen, 1992). In fact, since differences in (perceived) talents seem to explain part of the remaining variance, the information about lawyers' skills conveyed in trial outcomes might play an important role in future earnings. Even though there is a large economics literature on litigation, little is known about how lawyers' reputational concerns may affect litigation effort and the decision to settle.[2]

In this paper I study how career concerns influence effort levels, settlement decisions and the client-lawyer misalignment of interests. More importantly, because there are substantial interactions in the decisions of the two parties in a legal dispute, this paper pays special attention to how lawyers' decisions are affected by the career motives of their opponents. Also, I consider that the talent of the attorneys is uncertain not only for the market but also for themselves and for other attorneys (i.e., there is imperfect but symmetric information in the model), as usual in career concerns models. Inexperienced attorneys, who are those who may have stronger career concerns, are likely to have greater uncertainty about how they will perform in court. Moreover, although they probably know the rank of the law school from which they graduated, and the level of their performance there, this information is also available to the market. Thus, there is little room for private information and individual decisions will not involve any signaling behavior.

The model in this paper studies the effect of career concerns on the effort and settlement decisions of two attorneys opposing each other in a case. To model the career concerns of the attorneys, in addition to the explicit incentives (i.e., the award in case of winning minus effort costs),

[1] More than 250,000 civil cases are filed every year in Federal Courts in the United States. For instance, in 2007 there were about 36,000 cases filed related to personal injury product liability, and more than 10,000 related to the protection of copyrights, patents and trademarks (Administrative Office of the U.S. Courts, Statistical Tables for the Federal Judiciary, 2007).

[2] A short section in Dewatripont and Tirole (1999) discusses the robustness of their moral hazard model to the incorporation of career concerns. They argue that career concerns would not alter significantly their results. In contrast with their analysis, I consider a model where effort decisions are not binary, there may be asymmetries between the attorneys, and a settlement stage is studied.

there will be a term in each attorney's payoff function that is increasing in the market's inference about her talent. The weight that this term has in the attorney's payoff function will determine the strength of her career concerns. The market does not observe the attorney's talent directly; thus, the market's initial belief about the attorney's talent is given by the "prior" distribution about attorneys' capabilities. However, if the case is taken to court, the outcome of the trial provides additional information and will lead to an update of the market's initial beliefs (this creates the "posterior" distribution).

The results show that attorneys with career concerns attempt to influence the market's beliefs by exerting more effort. Even though the market cannot be fooled in equilibrium, attorneys with career concerns are trapped into providing higher effort levels than they would in the absence of reputational concerns.[3] That is, two attorneys with career concerns facing each other would be better off by coordinating on the no-career-concerns equilibrium effort levels; however, they would have individual incentives to deviate. Also, when two attorneys have different degrees of career concerns, then the attorney with stronger career concerns exerts more effort in equilibrium than her opponent. Consequently, she has a higher expected probability of prevailing in court. Moreover, the attorney with weaker career concerns exerts more effort than in an equilibrium where both had the same career concerns. Therefore, she is worse off than if both had the same career concerns because she is trapped into exerting more effort, but has a lower probability of prevailing in court. Similar results arise due to career concerns when the lawyers have different cost functions, or when the uncertainty over their respective talents is different.

These results affect the settlement stage because higher equilibrium effort levels imply larger trial costs and changes in the probability of prevailing in court. For instance, I show that an increase in the plaintiff's attorney's career concerns (holding the defendant's attorney's career concerns fixed) leads to a larger concession limit for the defendant; that is, the defendant's attorney is willing to settle at a larger settlement amount. Similarly, an increase in the defendant's attorney's career concerns (holding the plaintiff's attorney's career concerns fixed) leads to a smaller concession limit for the plaintiff's attorney; that is, the plaintiff's attorney is willing to settle at a lower settlement amount. In both cases, the overall effect on the settlement range is ambiguous because an increase in the career concerns of an attorney may increase or decrease her own concession limit.

Within the settlement range, the amount resulting from the bargaining stage depends on the bargaining power of the parties. I study the effect of career concerns for different possible bargaining solutions. The results show that having stronger career concerns is beneficial for the party with more bargaining power. For instance, when one of the attorneys has all the bargaining power, then she benefits from an increase in her career concerns. Intuitively, such an increase leads to higher equilibrium effort levels, and thus to a larger surplus from settlement, which is fully captured by the party with all the bargaining power. When using Nash (1950)'s bargaining solution, I find that an increase in the career concerns of the attorneys affects the settlement amount only when the

[3] Section 1.2. discusses evidence of this equilibrium effort trap.

attorneys have different career concerns. When increasing the career concerns of only one of the attorneys, she obtains a better outcome from the bargaining; in contrast, the attorney whose career concerns remain fixed is worse off. Similar results arise when modeling the settlement outcome using a random-proposer bargaining game.

In addition, the paper analyzes the extent to which the equilibrium effort levels are affected by the sensitivity of the trial outcome to the performance of the attorneys. I find that the effect of career concerns is increasing in the level of sensitivity. The driving force is that the more sensitive is the outcome of the trial to the talent of the attorneys, the more informative is winning or losing about the talent of the attorneys. I also study the implications of career concerns in the possible misalignment of interests between the plaintiff and her lawyer. The implicit incentives induced by career concerns may ameliorate the insufficient-investment distortion caused by contingent-fee arrangements (for a detailed analysis of such distortion, see Polinsky and Rubinfeld, 2003). However, this may not be the case if the opposing lawyer also has strong career concerns.

Section 2 describes the basic model set-up. Section 3 derives the attorneys' equilibrium effort levels when the attorneys are symmetric. Then I compare the results with the equilibrium effort levels when the career concerns, the cost functions, or the priors on the attorneys' talents are different. Section 4 studies the implications of Section 3's results for the decision to settle. Section 5 studies the effect of changing the sensitivity of the trial outcome to the performance of the attorneys. Section 6 examines the effect of career concerns on the misalignment of interests between the plaintiff and her attorney. Finally, Section 7 concludes.

1.1 Related literature

The contract theory literature introduced career concerns to study agency problems in one-agent models. As argued by Fama (1980), career concerns provide incentives for the agent to exert higher effort, to the point that it may solve a moral hazard problem. However, as pointed out by Holmström (1982, 1999), the effect of career concerns is smaller the lower is the uncertainty about the ability of the agents. Dewatripont et al. (1999a) extend the results to a more general framework with multiple tasks and where effort may affect the agent's future talent. In Dewatripont et al. (1999b), an application of this multitask model explains the important role of career concerns for government agencies' officials.

There are some other relevant applications of the career concerns framework. The literature in finance has done an extensive analysis of the effect of career concerns on investment decisions. In particular, career concerns may lead to inefficiencies (Scharfstein and Stein, 1990; Milbourn et al., 2001; and Dasgupta and Prat, 2008) or anomalies (Harbaugh, 2006). In general these models assume that agents have some private (although noisy) information about their talent.

The analysis in this paper differs from standard career concerns models because it considers a model with two opposing agents. That is, a lawyer's performance is determined not only by her talent and her effort level, but also by the performance of the other lawyer. In particular, I assume

that the performance of the attorneys in court is determined by a contest success function. I use a "difference-form" success function as in Che and Gale (2000), which implies that the probability of success is a function of the difference in the performance of the two lawyers. Examples of previous contest models' applications to litigation are Katz (1988), Farmer and Pecorino (1999, 2000), Wärneryd (2000), Hirshleifer and Osborne (2001), and Baik and Kim (2007). This paper is most closely related to Wärneryd (2000), and Baik and Kim (2007), which study strategic effects of delegating in lawyers the choice of effort. Nevertheless, none of these models accounts for career concerns.

In addition, the career concerns' model in this paper incorporates other features that are specific to litigation models. Legal disputes will not end up in court if parties settle. Therefore, the model will consider a settlement bargaining process prior to the trial stage, allowing me to study the impact of attorneys' career concerns on settlement decisions. Also, the outcome of the trial might be more or less sensitive to the performance of the attorneys depending on the type of case, court, or legal system. I study how the level of sensitivity affects the results. Finally, a section of the paper studies the effect of career concerns when the plaintiff and her lawyer have misaligned interests. I study how career concerns affect the misalignment that arise when the lawyer is compensated through a contingency fee, which consists of a percentage of the settlement or the award obtained by the plaintiff in court.

Previous articles have studied the effect of reputation in the legal profession. Fingleton and Raith (2005) study bargaining outcomes when the parties hire reputation-motivated agents to do the bargaining. Their analysis is based on the assumption that talent is the private information of the agent. They find that less talented bargainers are more aggressive in open door bargaining (i.e., when their clients can observe the bargaining process). As a consequence, open door bargaining has a higher probability of inefficient disagreements. Levy (2005) adapts the Scharfstein and Stein (1990) herding model of investment to a judicial framework wherein monitoring only takes place when litigants appeal. The author shows that judges with career concerns deviate from the efficient decision by "excessively contradicting" previous judicial decisions in order to signal ability.

A number of articles have analyzed the effect of compensation systems for lawyers; however, these models do not incorporate the effect of lawyers' career concerns. If implicit incentives have important effects on the decisions of lawyers, they will also affect the contracts between the lawyers and their clients. In a paper that studies the contract choice of a risk averse agent with career concerns, Gibbons and Murphy (1992) show that career concerns incentives play an important role even in the presence of explicit performance-based incentives. Furthermore, since career concerns effects are stronger for younger workers, weaker explicit incentives are optimal in their case, which is consistent with their empirical evidence studying CEO compensation. As they argue, "for young workers it can be optimal for current pay to be completely independent of current performance."

As a first step to study the effect of career concerns on the attorney-client contractual stage, I study the effect of implicit incentives on lawyers' decisions when the plaintiff compensates her

lawyer through a contingent fee (which consists of a percentage of the settlement or the award obtained by the plaintiff in court). Previous work has found three important results related to contingent fees. First, when the plaintiff does not observe the merits of her case and assuming that lawyers compete for plaintiffs' cases following a model of monopolistic competition, Dana and Spier (1993) show that compensation via contingent fees provides stronger incentives than hourly fees for the attorney to reveal when a case has low expected returns. In addition, Rubinfeld and Scotchmer (1993) find that, in a model with no restriction on the type of contracts that attorneys and clients can make but where all cases are assumed to go to trial, contingent fees serve as a screening device allowing clients to separate between high and low quality attorneys. High talent attorneys are willing to accept a lower contingent fee since they have a higher probability of prevailing in court. Finally, Polinsky and Rubinfeld (2003) show that contingent fees provide insufficient incentives for the attorney to devote the effort level desired by the plaintiff. The authors propose an alternative compensation system in which, in addition to a contingent fee, attorneys are partially compensated for their costs by a third party and independently of the outcome from the trial. However, their model focuses on the choice of effort of the plaintiff's attorney; thus, strategic interactions with the opposing lawyer are not considered. Also, the model does not account for career concerns.

1.2 Related empirical findings

The equilibrium effort trap found in this paper is consistent with some empirical findings about lawyers. Landers et al. (1996) find evidence that associate lawyers overwork, in the sense that they prefer a decrease in hours of work to an increase in their wage keeping the number of hours unchanged. Surveyed lawyers had to decide between three hypothetical changes in their current income and work hours. The results showed that almost two thirds of the associate lawyers in the sample were interested in decreasing their hours of work. Specifically, 65.1 percent chose a decrease in their work hours keeping the same income while only 25.56 percent preferred to keep their hours of work unchanged and have an increase of 5 percent in their income. Finally, only 9.02 percent chose an increase of 5 percent in hours and 10 percent in income. The authors argue that law firms induce lawyers to overwork as a screening device. Their framework assumes that attorneys differ in their disutility of work, and that they have private information about their types. In contrast, I study whether career concerns induce lawyers to work more hours in a framework where there is no signaling or screening involved.

Using confidential survey data from the "After the JD Study," Ferrer (2008) finds that young lawyers involved in court cases work nearly five hours per week more than other young practicing lawyers, once controlling for salary, educational background, size of the law firm, and other variables. Table 1 below illustrates this result by showing the unconditional average weekly work hours of the lawyers in this study. Comparing the second and third rows, it can be seen that the average weekly work hours is larger for young lawyers working in law firms that are involved in court cases than for those who are not. In contrast, as shown in the second and third columns, young lawyers

TABLE 1 – AVERAGE WEEKLY HOURS OF WORK (REPORTED)

	Weekly hours of work	Weekly hours expected to work	Weekly hours expected to bill
Inexperienced lawyers	50.18	46.53	39.78
Inexperienced lawyers working in law firms not involved in court	50.49	47.76	40.01
Inexperienced lawyers working in law firms, and involved in court cases	52.58	46.91	39.97

Survey data from 2002 of lawyers that passed the bar examination in 2000
Source: The "After the JD" study

involved in court cases are not expected to work or to bill more hours than the others.

This is consistent with the equilibrium trap studied in this paper. Because the trial outcome is a quite important source of information for the market, lawyers involved in court cases attempt to influence the market's beliefs by exerting more effort and winning the cases. In contrast, the measures to evaluate lawyers not directly involved in court cases are likely to be more diffuse (e.g., the market does not have such a clear measure of performance for lawyers involved in writing contracts or providing legal advice) and there is less room for an equilibrium trap.

2 The model

The plaintiff's attorney (AP) and the defendant's attorney (AD) face the decision of how much effort to exert in a case at Court.

Attorney Ai's talent is given by $t_i \in \{\tau_i^l, \tau_i^h\}$ where $0 < \tau_i^l < \tau_i^h \leq 1$ for $i = P, D$. I assume that AP and AD observe neither their own true talent nor their rival's talent. The market cannot observe the attorneys' talents either. In other words, there is imperfect but symmetric information in the model. Thus, there is a common prior over the talent of an attorney; however, the common priors over the talents of P and D may be different.[4] That is, the unconditional probability of attorney i having high talent is denoted by $\rho_i > 0$, which is common knowledge and where ρ_D may be different from ρ_P. This is an unconditional probability in the sense that it does not depend on the outcome of this specific dispute although it might depend on past trial outcomes. I denote as μ_i the *a priori* expected talent of attorney i. That is, $\mu_i = \rho_i \tau_i^h + (1 - \rho_i)\tau_i^l$.

[4] This assumption is standard in the career concerns literature (see for instance Holmström, 1982, 1999, and Dewatripont et al.,1999a). In the case of young attorneys, there seems to be little room for private information about talent since it is not difficult to have information about the academic background of the attorneys and because attorneys have uncertainty about how talented they are relative to their opponent.

The outcome of the trial, denoted by z, is a function of the attorneys' efforts, denoted e_i, $i = P$, D, and their talents:

$$z = \begin{cases} AP\ wins & \text{with probability} \quad \Phi(e_P, e_D, t_P, t_D) \\ AP\ loses & \text{with probability } 1 - \Phi(e_P, e_D, t_P, t_D) \end{cases}.$$

After the trial takes place, the market estimates the talent of each attorney based on the outcome of the trial; that is, the value of z. I assume that Φ takes the form:

$$\Phi(e_P, e_D, t_P, t_D) = \frac{1 + e_P t_P - e_D t_D}{2}. \tag{1}$$

In order to ensure that $\Phi \in [0, 1]$, I will make parametric assumptions sufficient to keep e_P and $e_D \in [0, 1]$ in equilibrium. This functional form belongs to the family of "difference-form" success functions that considers the probability of success as a function of the difference in the contestants' performances.[5]

Given the functional form assumed for Φ:

$$E_t(\Phi(e_P, e_D, t_P, t_D)) = \frac{1}{2} + \frac{\mu_P e_P - \mu_D e_D}{2}; \tag{2}$$

the expectation over Φ is taken with respect to both t_P and t_D, since there is common imperfect information about both attorneys' talents.

I assume that the attorney's performance is determined by talent and effort which are complements. Notice that the cross partial derivative of Φ (respectively, $1 - \Phi$) with respect to e_P and t_P (respectively, e_D and t_D) is positive. Thus, if the attorney's talent were known, more talented attorneys would exert more effort than less talented attorneys. As a consequence, a higher level of effort increases how informative the outcome of the trial is about each attorney's talent. This is the case because the effect of the talent on Φ is higher the more effort is implemented.

Since the function is linearly separable with respect to e_P and e_D, in the absence of career concerns the attorneys will have dominant strategies; that is, their optimal levels of effort will be independent of each other. Thus, the interactions that arise between the attorneys' decisions are due to the effect of career concerns.

The timing of the attorneys' decisions is:
Stage 1: Settlement stage; various bargaining solutions will be considered.
Stage 2: In case of trial the attorneys simultaneously decide how much effort to exert in Court.
In order to find the optimal decision in the settlement stage, the attorneys anticipate their optimal effort levels if they were to face each other in Court. The optimal levels of effort are determined by the attorneys' objective functions which are described below.

[5] Previous research using the "difference-form" success function assumes linear costs of effort (Hirshleifer, 1989; Che and Gale, 2000) while I will assume quadratic effort costs. Also, this form of success function is not homogenous of degree zero, and thus it does not belong to the family of functions studied in Skaperdas (1996).

2.1 AP's objective function

I assume that the interests of the attorney and her client are aligned in the sense that the attorney maximizes the combined payoff of P and AP. Section 6 studies the case of misaligned interests. Let W be the award obtained by the plaintiff in case of winning the trial. Then, AP chooses the level of effort in order to solve the following problem:

$$\max_{e_P \in [0,1]} W \cdot E_t(\Phi(e_P, e_D^*, t_P, t_D)) - \frac{c_P e_P^2}{2} + \beta_P \cdot \{E_t(\Phi(e_P, e_D^*, t_P, t_D)) \cdot \hat{t}_P(AP\ wins; e_P^*, e_D^*)$$
$$+E_t(1 - \Phi(e_P, e_D^*, t_P, t_D)) \cdot \hat{t}_P(AP\ loses; e_P^*, e_D^*)\},$$

where c_P is a cost parameter, e_D^* is AP's and the market's conjecture about AD's effort and e_P^* is the market's conjecture about AP's effort. The first two elements in the objective function represent $AP's$ explicit incentives: the expected award from Court minus effort costs. Effort costs are assumed to be quadratic because of decreasing returns from effort when finding evidence or legal arguments. In addition, effort may have an increasing cost in terms of the opportunity cost of having to decline other cases or clients.

The terms $\hat{t}_P(AP\ wins; e_P^*, e_D^*)$ and $\hat{t}_P(AP\ loses; e_P^*, e_D^*)$ are the key elements in modeling the attorney's reputational concerns. They represent the market's inference about AP's talent conditioned on the outcome of the trial and on the market's conjecture about AP's and AD's efforts. Attorneys with career concerns have payoffs that are increasing in the expected market's inference about their talent, which is the expression in curly brackets. Finally, β_P measures the weight of this expected inference with respect to the attorney's explicit incentives; that is, it measures the strength of $AP's$ career concerns.

The first-order condition[6] for the interior solution can be written as:

$$\frac{W\mu_P}{2} - c_P e_P + \frac{\beta_P \mu_P}{2}(\hat{t}_P(AP\ wins; e_P^*, e_D^*) - \hat{t}_P(AP\ loses; e_P^*, e_D^*)) = 0. \tag{3}$$

As shown in the Appendix, the difference between the market's inference about t_P in case of AP winning and in case of AP losing can be written as follows:

$$\hat{t}_P(AP\ wins; e_P^*, e_D^*) - \hat{t}_P(AP\ loses; e_P^*, e_D^*) = \frac{2e_P^*\sigma_P^2}{1 - (\mu_P e_P^* - \mu_D e_D^*)^2},$$

where σ_P^2 is the variance of the prior on AP's talent. Finally, notice that in equilibrium the level of effort chosen by AP has to coincide with the market's conjecture of her effort, e_P^*.

[6] Note that the objective function is strictly concave in e_P. Therefore, if the optimal $e_P \in (0,1)$, then it must satisfy equation (3).

2.2 AD's objective function

Similarly as for AP, assuming no agency problem between the defendant and her attorney, then AD chooses the level of effort in order to solve the following problem (reflecting the combined payoff of D and AD):

$$\max_{e_D \in [0,1]} -W \cdot E_t(\Phi(e_P^*, e_D, t_P, t_D)) - \frac{c_D e_D^2}{2} + \beta_D \cdot \{E_t(\Phi(e_P^*, e_D, t_P, t_D)) \cdot \hat{t}_D(AP\ wins; e_P^*, e_D^*)$$
$$+E_t(1 - \Phi(e_P^*, e_D, t_P, t_D)) \cdot \hat{t}_D(AP\ loses; e_P^*, e_D^*)\},$$

where e_P^* is AD's and the market's conjecture about AP's effort, and e_D^* is the market's conjecture of AD's effort. The first two elements in the objective function represent $AP's$ explicit incentives: the expected award from Court minus effort costs. As in AP's case, effort costs are assumed to be quadratic because of decreasing returns from effort when finding evidence or legal arguments.

The key elements in modeling $AD's$ reputational concerns are $\hat{t}_D(AP\ loses; e_P^*, e_D^*)$ and $\hat{t}_D(AP\ wins; e_P^*, e_D^*)$, which represent the market's inference about AD's talent conditioned on the outcome of the trial and on the market's conjectures about AP's and AD's efforts. Therefore, the expression in curly brackets represents the expected market's inference about $AD's$ talent. Finally, β_D measures the strength of $AD's$ career concerns.

Substituting $E_t(\Phi(e_P, e_D^*, t_P, t_D))$ in AD's maximization problem, the first-order condition for the interior solution can be written as:

$$\frac{W\mu_D}{2} - c_D e_D + \frac{\beta_D \mu_D}{2}(\hat{t}_D(AP\ loses; e_P^*, e_D^*) - \hat{t}_D(AP\ wins; e_P^*, e_D^*)) = 0. \tag{4}$$

As in the case of AP, it is shown in the Appendix that the difference between the market's inference about t_D in case of AD winning and in case of AD losing can be written as follows:

$$\hat{t}_D(AP\ loses; e_P^*, e_D^*) - \hat{t}_D(AP\ wins; e_P^*, e_D^*) = \frac{2e_D^* \sigma_D^2}{1 - (e_P^* \mu_P - e_D^* \mu_D)^2}.$$

where σ_D^2 is the prior variance on AD's talent. Finally, notice that in equilibrium the level of effort chosen by AD has to coincide with the market's conjecture of her effort, e_D^*.

3 The choice of effort in Court

In this section, first I find the equilibrium effort levels when the two attorneys are symmetric. Then I use the results of the symmetric case as a benchmark to study the effects of career concerns when the attorneys differ in the strength of their career concerns, in their cost functions, and in the prior on their talent.

3.1 The equilibrium level of effort in the symmetric case

When the attorneys are symmetric, then $\mu_P = \mu_D = \mu$, $\sigma_P^2 = \sigma_D^2 = \sigma^2$, $\beta_P = \beta_D = \beta$ and $c_P = c_D = c$. A first important implication is that:

$$E_t(\Phi(e_P, e_D^*, t_P, t_D)) = \frac{1}{2} + \frac{\mu(e_P - e_D)}{2}; \tag{5}$$

that is, whoever exerts more effort in court has a higher expected probability of winning the case. Notice that this is the case only for the expected probability of winning the case; the actual trial outcome depends on the realizations of the attorneys' talents.

According to the first-order condition in equation (3), AP's equilibrium effort level, e_P^*, must satisfy:

$$e_P^* \left(c - \frac{\beta\mu\sigma^2}{1 - \mu^2(e_P^* - e_D^*)^2} \right) = \frac{W\mu}{2}. \tag{6}$$

In order to ensure that in equilibrium $e_P^* \in (0,1)$, I assume that $c > W\mu/2 + \beta\mu\sigma^2/(1 - \mu^2(1 - e_D^*)^2)$ for all possible $e_D^* \in [0,1]$. To ensure that this condition holds it is enough to assume that $c > W\mu/2 + \beta\mu\sigma^2/(1 - \mu^2)$. Under this parametric assumption AP's optimal level of effort is always an interior solution since it ensures that $e_P^* < 1$. Notice that $e_P^* = 0$ is never an optimal level of effort for AP.

According to the first order condition in equation (4), AD's first-order condition for the interior solution is actually symmetric to AP's since it can be written as:

$$e_D^* \left(c - \frac{\beta\mu\sigma^2}{1 - \mu^2(e_P^* - e_D^*)^2} \right) = \frac{W\mu}{2}. \tag{7}$$

Since AD's maximization problem is symmetric to AP's, the parametric assumption taken for c also ensures that $e_D^* \in (0,1)$. Therefore, that assumption ensures that $\Phi \in [0,1]$ in equilibrium. Simplifying these two equations:

$$\left(c - \frac{\beta\mu\sigma^2}{1 - \mu^2(e_P^* - e_D^*)^2} \right) = \frac{W\mu}{2e_P^*} = \frac{W\mu}{2e_D^*}. \tag{8}$$

Therefore it must be that $e_P^* = e_D^*$.

Proposition 1 *The symmetric equilibrium is the only solution to the effort optimization problem of the attorneys. Therefore, the optimal levels of effort are:*

$$e^* = e_P^* = e_D^* = \frac{W\mu/2}{c - \beta\mu\sigma^2}. \tag{9}$$

The equilibrium effort levels are increasing in the Court award, W, and in the *a priori* expected talent of the attorneys, μ. Also, the attorneys exert more effort the higher is the variance of the prior on their talent, holding the mean, μ, constant. In other words, the greater is the uncertainty

about their talent, the more incentives they have to exert a higher level of effort. Since the variance of the prior may be expressed as $\rho(1-\rho)(\tau^h - \tau^l)^2$, a mean preserving spread of the attorneys' types leads to an increase in the effort levels. However, the effect of ρ on the equilibrium effort level is ambiguous. Finally, the equilibrium effort levels are decreasing in the cost parameter, c. Notice that the parametric assumption made above to ensure interior solutions implies that $c - \beta\mu\sigma^2$ is always strictly positive. Table 2 below summarizes the effect of increases in the parameters on e^*.

TABLE 2 - Comparative statics regarding increases in the parameters

		W	μ	σ^2	$(\tau^h - \tau^l)^2$	ρ	β	c
Effect on the equilibrium effort	e^*	$\uparrow$	$\uparrow$	$\uparrow$	$\uparrow$	?	$\uparrow$	$\downarrow$

Let $\Phi^* = \Phi(e_P^*, e_D^*, t_P, t_D)$ be the realized probability that AP succeeds at trial. Since the equilibrium effort levels are equal and the talents of the attorneys are not known, the expected probability that AP wins the trial is $E_t\{\Phi^*\} = 1/2$. Furthermore, since the equilibrium efforts coincide, if one attorney has higher talent than the other, then the realized probability of prevailing in Court is also higher. If the talents of AP and AD are the same then Φ^* is also $1/2$.

The market anticipates how much effort to expect from the attorneys; hence, the attorney's effort decisions cannot mislead the market's inference (i.e., $E_t\{\Phi^*\} \cdot \hat{t}_P(AP\ wins; e_P^*, e_D^*) + E_t\{1 - \Phi^*\} \cdot \hat{t}_P(AP\ loses; e_P^*, e_D^*) = \mu$). However, the attorneys are trapped into providing higher effort than in the case without career concerns. Notice that if β is zero for both attorneys, then the effort implemented in equilibrium would be $\frac{W\mu}{2c}$, which is lower than e^*.

Therefore, as argued in a one-agent model by Fama (1980), career concerns provide incentives for agents to exert higher effort. As a consequence, explicit incentives may not need to be as strong in the presence of career concerns. However, as pointed out by Holmström (1982), the effect of career concerns is smaller the lower is the uncertainty about the ability of the agents. In this model, as the variance of the prior on the attorneys' talent decreases, so does the equilibrium effort. Therefore, reputational incentives are stronger the less precise is the market's initial information about the attorneys' talents.

3.2 Asymmetric career concerns

Assume now that AP and AD have career concerns measured by β_P and β_D, respectively, where $\beta_P > \beta_D$. Then the equilibrium levels of effort, e_P^* and e_D^*, must satisfy:

$$e_P^* \left(c - \frac{\beta_P \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right) = \frac{W\mu}{2}, \tag{10}$$

$$e_D^* \left(c - \frac{\beta_D \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right) = \frac{W\mu}{2}. \tag{11}$$

Therefore, since $\beta_P > \beta_D$ it must be that $e_P^* > e_D^*$ in any possible equilibrium[7], since the expression in parentheses is smaller in the first equation. Similarly, for $\beta_P < \beta_D$ it must be that $e_P^* < e_D^*$ in equilibrium. Put differently, the attorney with higher career concerns exerts more effort in equilibrium.

Furthermore, it can be shown that a change in β for one of the attorneys affects the level of effort of the other attorney even when her own β remains unchanged. To see this, let the initial attorneys' equilibrium effort levels be e^* as in equation (9), where career concerns are $\beta_P = \beta_D = \beta$. Now suppose that β_P increases while β_D remains equal to β, let e_P^* and e_D^* denote the new equilibrium effort levels in this case. As was shown at the beginning of this subsection, whenever $\beta_P > \beta_D$ then the equilibrium effort level of AP is greater than the equilibrium effort level of AD (i.e., $e_P^* > e_D^*$). In order to compare these new equilibrium effort levels with the initial equilibrium, notice that e_D^* and e^*must satisfy equation (11) and (9), respectively. Thus:

$$e_D^* \left(c - \frac{\beta_D \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right) = e^* \left(c - \beta \mu \sigma^2 \right),$$

where since $\beta_D = \beta$, it must be that $e_D^* > e^*$ since (given the domains defined for effort and talent) $1 - \mu^2 (e_D^* - e_P^*)^2 \in (0, 1]$. Therefore, an increase in AP's career concerns induces AD to increase her equilibrium effort level.

In addition, notice that e_P^* and e^* must satisfy equations (10) and (9), respectively. Thus:

$$e_P^* \left(c - \frac{\beta_P \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right) = e^* \left(c - \beta \mu \sigma^2 \right),$$

where $e_P^* > e^*$ since $\beta_P > \beta$ implies that the expression in parentheses in the left-hand side of the equation is larger than the one in the right-hand side. Therefore, when AP's career concerns increase, AP's new equilibrium effort level is higher than her initial equilibrium effort level and higher than AD's new equilibrium effort level.

An analogous result holds for an increase in β_D when β_P remains fixed. The following proposition and Figure 1 summarize these results.

Proposition 2 *Starting from $\beta_P = \beta_D = \beta$, an increase in β_i (holding β_j fixed) implies that both attorneys increase their effort but Ai increases more than Aj.*

[7] It may be that more than one pair (e_P^*, e_D^*) satisfies the conditions above.

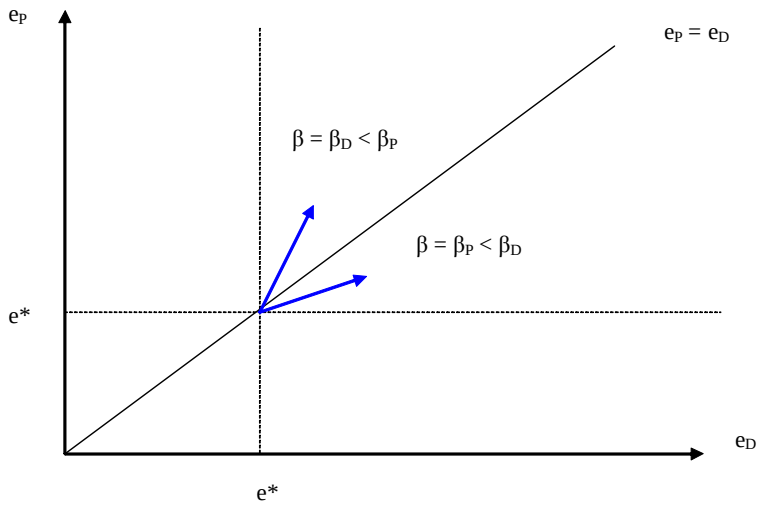

Figure 1: Equilibrium effort levels when increasing β_i while holding β_j fixed

3.3 Asymmetric costs

Assume now that the attorneys' costs functions differ such that $c_P < c_D$. The equilibrium effort levels, e_P^* and e_D^*, must satisfy:

$$e_P^* \left(c_P - \frac{\beta\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2} \right) = \frac{W\mu}{2}, \tag{12}$$

$$e_D^* \left(c_D - \frac{\beta\mu\sigma^2}{1-\mu^2(e_P^* - e_P^*)^2} \right) = \frac{W\mu}{2}. \tag{13}$$

Therefore, in any possible equilibrium[8] it must be that $e_P^* > e_D^*$. Because effort is less costly for AP, she exerts more effort than AD in equilibrium. Similarly, for $c_P > c_D$ it must be that $e_P^* < e_D^*$ in equilibrium. Thus, the attorney with higher costs exerts less effort in equilibrium.

Most importantly, following the same procedure as with asymmetric career concerns, it can be shown that when $\beta > 0$ a change in costs for one of the attorneys affects the level of effort of the other attorney even when her own costs remain unchanged. Notice that when the attorneys have no career concerns (i.e., $\beta = 0$), there are no interactions between the attorneys' choices of effort. More specifically, AP would exert a level of effort $W\mu/2c_P$ that is independent of the cost function of her opponent, while AD would choose a level of effort $W\mu/2c_D$.

In contrast, when $\beta > 0$ there are interactions between e_P^* and e_D^*. To see this, let the initial attorneys' equilibrium effort levels be e^* as in equation (9), where the attorneys' cost parameters are $c_P = c_D = c$. Now suppose that c_P decreases while c_D remains equal to c, let e_P^* and e_D^* denote the new equilibrium effort levels in this case. As shown above, because $c_P < c_D$ then the

[8] It may be that more than one pair (e_P^*, e_D^*) satisfies the conditions above.

equilibrium effort level of AP is greater than the equilibrium effort level of AD (i.e., $e_P^* > e_D^*$). Hence, it is possible to compare these new equilibrium effort levels with the initial equilibrium. First, e_D^* and e^* must satisfy equations (13) and (9), respectively. Thus:

$$e_D^* \left(c - \frac{\beta\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2} \right) = e^* \left(c - \beta\mu\sigma^2 \right), \tag{14}$$

where it must be that $e_D^* > e^*$ since (given the domains defined for effort and talent) $1-\mu^2(e_D^* - e_P^*)^2 \in (0,1]$. That is, when AP's cost of effort decreases (holding AD's costs fixed), AD's equilibrium effort level increases.

Second, notice that e_P^* and e^* must satisfy equations (12) and (9), respectively, which implies that:

$$e_P^* \left(c_P - \frac{\beta\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2} \right) = e^* \left(c - \beta\mu\sigma^2 \right), \tag{15}$$

where $e_P^* > e^*$ since $c_P < c$ implies that the expression in parentheses in the left-hand side of the equation is smaller than the one in the right-hand side. Therefore, when AP's cost of effort decreases, AP's new equilibrium effort level is higher than her initial equilibrium effort level and higher than AD's new equilibrium effort level.

An analogous result holds for an increase in c_D when c_P remains fixed. The following proposition and Figure 2 summarize these results.

Proposition 3 *Starting from $c_P = c_D = c$, a decrease in c_i (holding c_j fixed) implies that, for $\beta > 0$, both attorneys increase their effort, but Ai increases more than Aj.*

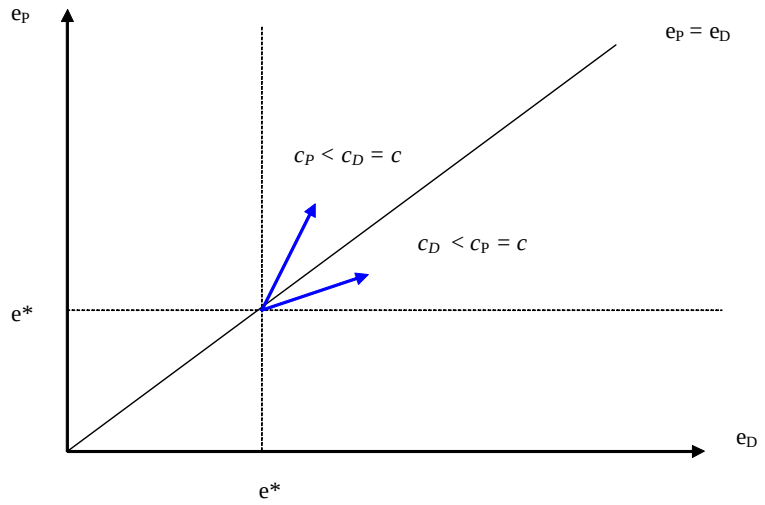

Figure 2: Equilibrium effort levels when decreasing c_i holding c_j fixed

3.4 Asymmetric priors

The priors on the attorneys' talents may be different due, for instance, to differences in the rank of the law school from which they graduated, or in past performance in Court. An important difference with respect to the symmetric case is that exerting more effort in court does not necessarily imply a higher expected probability of winning. In particular, for attorney i to have a higher expected probability of prevailing in court than attorney j, her effort level must be such that $e_i > e_j\mu_j/\mu_i$.

According to the first-order condition in equation (3), AP's equilibrium effort level, e_P^*, must satisfy:

$$\frac{W\mu_P}{2} = e_P^* \left(c - \frac{\beta\mu_P\sigma_P^2}{1-(\mu_P e_P^* - \mu_D e_D^*)^2} \right). \tag{16}$$

In order to ensure that in equilibrium $e_P^* \in (0,1)$, I assume that $c > W\mu_P/2 + \beta\mu_P\sigma_P^2/(1-(\mu_P - \mu_D e_D^*)^2)$ for all possible $e_D^* \in [0,1]$. To ensure that this condition holds it is enough to assume that c is large enough.[9] Notice that, as in the case of symmetric priors, $e_P^* = 0$ is never an optimal level of effort for AP.

Similarly, AD's first-order condition for an interior solution is given by:

$$\frac{W\mu_D}{2} = e_D^* \left(c - \frac{\beta\mu_D\sigma_D^2}{1-(e_P^*\mu_P - e_D^*\mu_D)^2} \right). \tag{17}$$

As in the case of AP, in order to ensure that in equilibrium $e_D^* \in (0,1)$, I assume that $c > W\mu_D/2 + \beta\mu_D\sigma_D^2/(1-(\mu_P e_P^* - \mu_D)^2)$ for all possible $e_D^* \in [0,1]$. To ensure that this condition holds it is enough to assume that c is larger enough.[10] Notice that, as in the case of symmetric priors, $e_D^* = 0$ is never an optimal level of effort for AD.

In equilibrium, AP's and AD's levels of effort must satisfy equations (16) and (17). Thus, they must satisfy:

$$\frac{e_P^*}{\mu_P}\left(c - \frac{\beta\mu_P\sigma_P^2}{1-(\mu_P e_P^* - \mu_D e_D^*)^2} \right) = \frac{e_D^*}{\mu_D}\left(c - \frac{\beta\mu_D\sigma_D^2}{1-(e_P^*\mu_P - e_D^*\mu_D)^2} \right).$$

To compare the equilibrium effort levels when the priors are asymmetric, I focus on one possible interesting case of asymmetric priors: attorneys having the same prior expected talent but different prior variance. This case arises if, for instance, there is more uncertainty over the talent of one of the lawyers because of shorter experience. As discussed previously, higher expected talent is associated with higher effort levels because of the complementarities between effort and talent. In order to focus only on the effects of differences in the prior variance, Proposition 4 and Figure 3 compare the equilibrium effort levels when assuming the same prior expected talent.

[9] Specifically, $c - W\mu_P/2 > \max\{\beta\mu_P\sigma_P^2/(1-\mu_P^2),\ \beta\mu_P\sigma_P^2/1-(\mu_P-\mu_D)^2\}$. Under this parametric assumption, AP's optimal level of effort is always an interior solution since the assumption ensures that $e_P^* < 1$.

[10] Specifically, $c - W\mu_D/2 > Max\{\beta\mu_D\sigma_D^2/(1-\mu_D^2), \beta\mu_D\sigma_D^2/1-(\mu_P-\mu_D)^2\}$. Under this parametric assumption, AD's optimal level of effort is always an interior solution since the assumption ensures that $e_D^* < 1$.

Proposition 4 *Let $\tau_i^l, \tau_i^h, \tau_j^l, \tau_j^h, \rho_i$ and ρ_j for $i, j \in \{P, D\}$ be such that $\mu_i = \mu_j$ and $\sigma_j < \sigma_i$. Then:*

i) In equilibrium, the attorney with a higher prior variance exerts more effort in Court (i.e., $e_j^* < e_i^*$).

ii) Starting at $\mu_i = \mu_j = \mu$ and $\sigma_i^2 = \sigma_j^2 = \sigma$, an increase in σ_i^2 (holding σ_j^2 fixed) implies that both attorneys increase their effort but Ai increases more than Aj.

Proof. See the Appendix ■

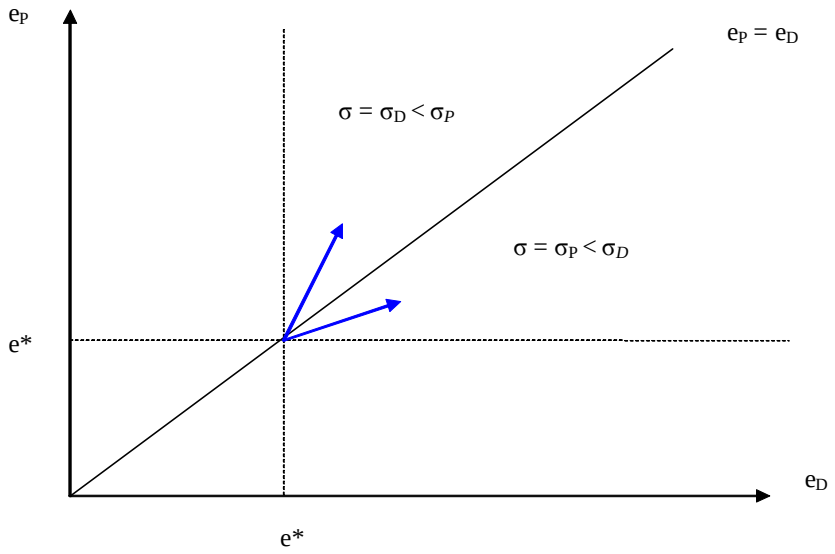

Figure 3: Equilibrium effort levels when increasing σ_i while holding μ and σ_j fixed

Intuitively, winning a case has a larger positive effect for the attorney with a higher prior variance because the market has greater uncertainty over her talent. Similarly, losing a case has a larger negative effect. Thus, her incentives to exert more effort in Court are stronger.

4 Settlement

Considering the equilibrium effort levels in case of trial, it is possible to study the effects of career concerns on the settlement process. As usual in settlement bargaining models, the concession limits are increasing in the court costs. In this model the court costs depend on the equilibrium choice of effort, and thus are determined endogenously in the litigation stage. Thus, the settlement range depends on the attorneys' anticipated equilibrium choices of effort.

In this section I focus on the case in which settlement is not informative about the talent of the attorneys and thus has no effect on the priors of the litigation stage. For instance, this is the case

when the kind of talent relevant for bargaining is different (and somehow uncorrelated) from the kind of talent relevant in the trial stage. Also, trials appear to be more informative about talent than settlement process because trials are usually complex procedures that test the attorneys' skills to a greater extent, and because many settlement agreements are sealed, in contrast with court judgments that are publicly available in general.

In other cases, settlement provides information about the attorneys' litigation talent. In particular, reaching a good settlement agreement might reveal that the attorney is talented. If the settlement agreement is sealed then the attorney would acquire private information about her talent and there would be asymmetric information in the litigation stage. Also, depending on whether a settlement agreement is reached or not, the market might also update its information about the attorneys' talents. Alternatively, if the agreement is publicly available, then the settlement outcome would be informative about the attorneys' talents and would affect the priors on the attorneys' talents. As a consequence, career concerns may affect the attorneys' strategies in a similar way as in the litigation stage studied above. These cases are left for further research.

4.1 Settlement in the symmetric case

When the career concerns, the cost functions, and the priors of AP and AD are identical, the attorney's equilibrium effort levels in case of trial coincide. I continue to assume that the interests of the client and the attorney are aligned; thus, the choice of whether to settle or not is made by considering the combined payoff of each attorney and her client. Section 6 discusses a possible attorney-client misalignment of interests in the settlement stage.

Denote the market's inference of attorney i's talent in case of settlement as $\hat{t}_i(settle; e_P^*, e_D^*)$, $i = P, D$. Since settlement does not provide any additional information over the talent of the attorneys, $\hat{t}_i(settle; e_P^*, e_D^*)$ is the *a priori* expected talent, μ. Notice that since attorneys have the same uncertainty over their talents as the market does, settlement decisions do not signal any information about the attorneys' talents either.

Therefore, AP settles as long as the payoff from settlement, S, is at least as large as the *ex ante* expected combined payoff from going to trial. That is, if it satisfies:

$$S + \beta \cdot \hat{t}_P(settle; e_P^*, e_D^*) \geq \frac{W}{2} - \frac{ce^{*^2}}{2} + \beta E_{t,z}\{\hat{t}_P(z; e_P^*, e_D^*)\},$$

which is equivalent to:

$$S + \beta\mu \geq \frac{W}{2} - \frac{ce^{*^2}}{2} + \beta\mu.$$

Thus, career concerns affect the settlement constraint only through their effect on the effort choice.

Similarly, AD settles as long as the settlement amount, S, is at most what she expects to lose

from going to trial. That is:

$$S + \beta \cdot \hat{t}_D(settle; e_P^*, e_D^*) \leq \frac{W}{2} + \frac{ce^{*^2}}{2} - \beta E_{t,z}\{\hat{t}_P(z; e_P^*, e_D^*),$$

which is equivalent to:

$$S + \beta\mu \leq \frac{W}{2} + \frac{ce^{*^2}}{2} - \beta\mu.$$

Therefore, the settlement range is given by:

$$S \in \left[\frac{W}{2} - \frac{ce^{*^2}}{2}, \quad \frac{W}{2} + \frac{ce^{*^2}}{2}\right].$$

Since e^* is increasing in β, stronger career concerns of the attorneys lead to larger trial costs. As a consequence, stronger career concerns result in a larger scope for settlement. In other words, because career concerns provide incentives to be more aggressive at the trial stage, the gains from settlement, ce^{*^2}, are increasing in the strength of the attorneys' career concerns. Thus, career concerns (as modeled here) do not make the attorneys uniformly (i.e., in all the stages of the legal dispute) more aggressive.

4.2 Settlement with asymmetric career concerns

Suppose as in Section 3.4 that $\beta_P \neq \beta_D$. Then in case of trial, the attorneys' equilibrium levels of effort differ from each other; that is, $e_P^* \neq e_D^*$. Consequently, the attorneys no longer have the same expected probability of prevailing in Court and the costs of going to trial also differ.

As in the symmetric case, the market's inference after settlement is also the *a priori* expected talent, μ. Thus, career concerns affect settlement decisions again only through their effect on the effort choice.

AP settles as long as the payoff from settlement, S, is at least as large as the expected combined payoff from going to trial. That is:

$$S \geq AP\text{'s concession limit } \equiv W \cdot E_t\{\Phi^*\} - \frac{c(e_P^*)^2}{2}. \tag{18}$$

Similarly, *AD* settles as long as the settlement amount, S, is at most what she expects to lose from going to trial:

$$S \leq AD\text{'s concession limit} \equiv W \cdot E_t\{\Phi^*\} + \frac{c(e_D^*)^2}{2}. \tag{19}$$

Therefore, the settlement range is now given by:

$$S \in \left[\frac{W}{2}(1 + \mu(e_P^* - e_D^*)) - \frac{c(e_P^*)^2}{2}, \quad \frac{W}{2}(1 + \mu(e_P^* - e_D^*)) + \frac{c(e_D^*)^2}{2}\right]. \tag{20}$$

An increase in the career concerns of one of the attorneys affects the settlement range because

the equilibrium levels of effort change, and hence so do the trial costs. For instance, recall from Section 3.4 that if AP's career concerns increase such that $\beta_P > \beta_D = \beta$, then $e_P^* > e_D^* > e^*$. As a consequence, AD's concession limit increases not only because her expected probability of prevailing in Court decreases but also because her anticipated trials costs are larger. Notice that this is true even though AD's career concerns remain fixed, as shown in Proposition 2.

More generally, if an attorney $Ai's$ career concerns increase (holding β_j fixed) such that $\beta_i > \beta_j$, then $Aj's$ equilibrium level of effort increases but her expected probability of prevailing in Court decreases. Consequently, an increase in $Ai's$ career concerns affects $Aj's$ concession limit. On the other hand, Ai's expected probability of prevailing in Court is larger than in the symmetric case because now $e_i^* > e_j^*$, as shown in Proposition 2. However, i's trial costs also increase when β_i increases. Therefore, the effect on Ai's concession limit is ambiguous. The following proposition summarizes these results.

Proposition 5 *Starting from $\beta_P = \beta_D = \beta$:*
i) An increase in β_P (holding β_D fixed) implies that AD's concession limit increases, while the effect on AP's concession limit is ambiguous.
ii) An increase in β_D (holding β_P fixed) implies that AP's concession limit decreases, while the effect on AD's concession limit is ambiguous.

4.3 Settlement with asymmetric costs

Suppose as in Section 3.5 that $c_P \neq c_D$. Then in case of trial, the attorneys' equilibrium levels of effort differ from each other; that is, $e_P^* \neq e_D^*$. Hence, the attorneys no longer have the same expected probability of prevailing in Court.

Since the cost parameters are common knowledge, the market's inference after settlement is also the *a priori* expected talent, μ. Therefore, changes in the settlement decisions arise due only to the changes created in the effort levels. Also, the attorneys' *ex ante* expectation of the market's inference about their talent is the average talent, μ, both in case of settlement and in case of trial.

The attorneys' concession limits and settlement range are again given by expressions (18), (19) and (20). Using the results in Proposition 3, if an attorney $Ai's$ cost parameter c_i decreases (holding c_j fixed) such that $c_i < c_j$, then Aj's equilibrium effort level increases but her expected probability of prevailing in Court decreases. Consequently, an increase in $Ai's$ career concerns affects $Aj's$ concession limit. With respect to Ai, her expected probability of prevailing in Court is larger than in the symmetric because now $e_i^* > e_j^*$. However, i's trial costs also increase since e_i^* increases when c_i decreases. Therefore, the effect on Ai's concession limit is ambiguous. The following proposition summarizes these findings.

Proposition 6 *Starting from $c_P = c_D = c$:*
i) A decrease in c_P (holding c_D fixed) implies that AD's concession limit increases, while the effect

on AP's concession limit is ambiguous.
ii) A decrease in c_D (holding c_P fixed) implies that AP's concession limit decreases, while the effect on AD's concession limit is ambiguous.

4.4 Settlement with asymmetric priors

When the priors on the attorneys' talents differ, the equilibrium effort levels, and therefore the settlement stage, are affected. Given the attorneys' concessions limits and settlement range in expressions (18), (19) and (20), Proposition 4 implies that an increase in the prior variance of one of the attorneys increases the scope of settlement. More specifically, when the priors are such that $\mu_P = \mu_D$ and $\sigma_P > \sigma_D$, AP exerts more effort in equilibrium (i.e., $e_P^* > e_D^*$), and has a higher expected probability of prevailing in court than AD. Also, Proposition 4 shows that AD's effort level is larger than in the symmetric case. Thus, AD's concession limit increases because when facing an attorney with a larger σ_P, her probability of prevailing in Court decreases and her anticipated trial costs increase. On the other hand, the effect on $AP's$ equilibrium level of effort is ambiguous since her expected probability of prevailing in Court is larger than in the symmetric, because now $e_P^* > e_D^*$, as shown in Proposition 4, but her trial costs also increase. The analogous result can be shown for an increase in σ_D. The following proposition summarizes these results.

Proposition 7 *Starting from $\sigma_P = \sigma_D = \sigma$:*
i) An increase in σ_P (holding σ_D, μ_P and μ_D fixed) implies that AD*'s concession limit increases, while the effect on AP's concession limit is ambiguous.*
ii) An increase in σ_D (holding σ_P, μ_P and μ_D fixed) implies that AP*'s concession limit decreases, while the effect on AD's concession limit is ambiguous.*

4.5 The outcome of bargaining

Since there is symmetric information in the model, the parties always settle. That is, the parties never reach the trial stage because they agree on a settlement amount. Within the settlement range, the settlement amount resulting from the bargaining stage depends on the bargaining power of the parties. Table 3 shows settlement outcomes using four possible bargaining solutions for both the case of symmetric and asymmetric career concerns.

In the first bargaining solution considered, AD has all the bargaining power. The outcome corresponds to a sequential game in which AD makes a-take-or-leave-it-offer.[11] If AP rejects the offer the parties go to trial. Thus, AD offers a settlement amount S^* equal to AP's concession

[11] This case is particularly relevant since, as shown by Schwartz and Wickelgren (2009), its outcome coincides with the outcome of an alternating-offer bargaining game with an indefinite number of possible offers and counter-offers. Intuitively, in such a game, the defendant has no interest in terminating the bargaining and she can always deter the plaintiff from doing so by making an offer equal to the plaintiff's outside option.

limit, and AP accepts it.[12] Analogously, in the second bargaining solution considered AP has all the bargaining power. Thus, AP offers a settlement amount equal to AD's concession limit, and AD accepts it.

TABLE 3: Outcome of the Settlement Bargaining Stage

	Symmetric case		**Asymmetric case**
Bargaining solution	**S***	**Effect of ↑ β**	**S***
AD has all bargaining power	$\frac{W}{2}-\frac{ce^{*2}}{2}$	$S^*\downarrow$	$\frac{W}{2}(1+\mu_P e_P{}^*-\mu_D e_D{}^*)-\frac{c_P e_P{}^{*2}}{2}$
AP has all bargaining power	$\frac{W}{2}+\frac{ce^{*2}}{2}$	$S^*\uparrow$	$\frac{W}{2}(1+\mu_P e_P{}^*-\mu_D e_D{}^*)+\frac{c_D e_D{}^{*2}}{2}$
Nash Bargaining Solution	$\frac{W}{2}$	No effect	$\frac{W}{2}(1+\mu_P e_P{}^*-\mu_D e_D{}^*)-\frac{1}{4}(c_P e_P{}^{*2}-c_D e_D{}^{*2})$
Random proposer with γ prob. that AP proposes	$\frac{W}{2}+ce^{*2}(\gamma-1/2)$	$S^*\uparrow$ if $\gamma>1/2$ $S^*\downarrow$ if $\gamma<1/2$	$\frac{W}{2}(1+\mu_P e_P{}^*-\mu_D e_D{}^*)-$ $-\frac{1}{2}((1-\gamma)c_P e_P{}^{*2}-\gamma c_D e_D{}^{*2})$

In both of these cases, as shown in Table 3, an increase in the career concerns of the attorneys benefits the party that has all the bargaining power. Intuitively, such an increase leads to higher equilibrium effort levels, and thus to a larger surplus from settlement, which is fully captured by the party with all the bargaining power. By the same reasoning, the attorney with all the bargaining power benefits from an increase affecting only her career concerns. Specifically, when AD has all the bargaining power then $\beta_D > \beta_P$ (assuming that the attorneys have the same costs and average talent) implies that $S^* < W/2 - ce^{*2}/2$, which is the bargaining outcome when the attorneys have the same career concerns and AD has all the bargaining power. Similarly, when AP has all the bargaining power, then $\beta_P > \beta_D$ (assuming that the attorneys have the same costs and average talent) implies that $S^* > W/2 + ce^{*2}/2$, which is the bargaining outcome when both attorneys have the same career concerns and AP has all the bargaining power. Therefore, asymmetric career concerns reinforce the bargaining advantage in these cases.

[12] AP is indifferent between accepting the offer and going to trial. I assume that AP accepts since otherwise AD could induce AP's acceptance by increasing the offer slightly.

However, asymmetric career have an ambiguous effect on the settlement amount when the attorney with stronger career concerns is the one with no bargaining power. Recall from Section 4.2 that the expected probability of prevailing in Court is larger for the attorney with stronger career concerns. A similar effect on the outcome of bargaining arises for asymmetric costs and asymmetric priors.Table 3 also reports the bargaining outcomes under the notion of Nash (1950)'s bargaining solution. As shown in the Table, an increase in the career concerns of the attorneys does not affect the settlement amount when both attorneys have the same career concerns. However, the settlement outcome does change when the attorneys have different career concerns. When increasing the career concerns of AP while AD's career concerns remain unchanged, then S^* increases and AP obtains a better outcome while AD is worse off.[13] Analogously, when increasing the career concerns of AD, then S^* decreases and AD obtains a better outcome while AP is worse off.[14] A similar effect on the outcome of bargaining arises for asymmetric costs and asymmetric priors.

In the last of the bargaining solutions considered in Table 3, the attorney making a take-it-or-leave-it offer is chosen randomly where γ represents the probability that AP is the proposer. As shown in the middle column of the Table, raising β increases i's payoff if she is the attorney that is more likely to propose. However, if both attorneys are equally likely to propose (i.e., if $\gamma = 1/2$), then raising β has no effect on the settlement amount. Notice that the Nash bargaining outcome coincides with the outcome when both attorneys are equally likely to be the proposer (i.e., when $\gamma = 1/2$). Therefore, career concerns reinforce again the position of the party with larger bargaining power.

5 Modeling the trial outcome's sensitivity to the attorneys' performance

In this section I study how previous results are affected by the trial outcome's sensitivity to the performance of the attorneys. The sensitivity of the trial outcome might vary depending on the type of case, on the type of court that makes the decision, or on the type of legal system. For instance, verdicts from judges and verdicts from juries sometimes differ, as studied by previous research.[15] In my particular framework, it could be that juries are more sensitive to the skills of the attorneys (e.g., communication skills), while judges might focus more on the merits of the case. Similarly, the outcome of the trial in the adversarial system perhaps depends more on the talents of the attorneys while in the inquisitorial system the skills of the lawyers might not be as important. As argued by Glendon et al. (1982) in civil law countries "the judge may inject new theories, new legal and factual sides, thus reducing the disadvantage of the party with the less competent lawyer."

An interesting feature of the form assumed for Φ is that it is possible to parametrize the level of sensitivity, as noticed by Che and Gale (2000). Let the probability of AP prevailing in Court,

[13] This is true except if β_P increases to the extent that $e_P^* + e_D^* > 2W\mu/c$.
[14] This is true except if β_D increases to the extent that $e_P^* + e_D^* > 2W\mu/c$.
[15] See Spier (2007) for an overview of some of the results.

Φ, take now the form:

$$\Phi(e_P, e_D, t_P, t_D) = \frac{1 + s(e_P t_P - e_D t_D)}{2}, \tag{21}$$

where s measures the sensitivity of the trial outcome to the difference in the attorneys' performance. When $s = 0$ the outcome of the trial is completely insensitive to the performance of the attorneys. In contrast, when s is large, a slightly better performance implies a large probability of winning the case. For simplicity in the analysis, I will restrict the sensitivity to be $s \in [0, 1]$. Notice that the results in previous sections correspond to the case where $s = 1$.

The expected probability of AP prevailing in Court is then given by:

$$E_t(\Phi(e_P, e_D^*, t_P, t_D)) = \frac{1}{2} + \frac{s(\mu_P e_P - \mu_D e_D)}{2},$$

where μ_P and μ_D are AP's and AD's a priori expected talents, respectively. Substituting this expected probability, it is possible to solve the maximization problems of AP and AD from Section 2. As shown in the Appendix, the difference between the market's inference about t_P in case of AP winning and in case of AP losing can be written as follows:

$$\hat{t}_P(AP\ wins; e_P^*, e_D^*) - \hat{t}_P(AP\ loses; e_P^*, e_D^*) = \frac{2s e_P^* \sigma_P^2}{1 - s^2(\mu_P e_P^* - \mu_D e_D^*)^2}.$$

Similarly for t_D:

$$\hat{t}_D(AP\ loses; e_P^*, e_D^*) - \hat{t}_D(AP\ wins; e_P^*, e_D^*) = \frac{2s e_D^* \sigma_D^2}{1 - s^2(e_P^* \mu_P - e_D^* \mu_D)^2}.$$

As shown in the following proposition, the effect of career concerns on the level of effort depends on the level of sensitivity.

Proposition 8 *Holding effort fixed, the more sensitive is the trial outcome to the performance of the attorneys, the more informative it is about the attorneys' talent. More specifically, $\hat{t}_P(AP\ wins; e_P^*, e_D^*)$ and $\hat{t}_D(AP\ loses; e_P^*, e_D^*)$ are increasing in s, while $\hat{t}_P(AP\ loses; e_P^*, e_D^*)$ and $\hat{t}_D(AP\ wins; e_P^*, e_D^*)$ are decreasing in s. Furthermore, when the trial's outcome is completely insensitive to the attorney's performance (i.e., $s = 0$), career concerns have no effect because the outcome of the trial is not informative about the talent of the attorneys.*

Proof. See the Appendix. ■

As a consequence, a more informative trial outcome amplifies the effect of career concerns on the choice of effort. For instance, when the prior of the attorneys' talent coincides and both attorneys have the same career concerns and cost functions, then:

$$e_P^* = e_D^* = \frac{W s \mu / 2}{c - \beta s^2 \mu \sigma^2}.$$

Thus, effort levels are increasing in s. Notice that $\partial^2 e_i^*/\partial\beta\partial s > 0$. The effect of career concerns on effort is increasing in the trial outcome's sensitivity, s. As a consequence, the additional gains from settlement due to the effect of career concerns are also increasing in the level of sensitivity, s. Intuitively, the more sensitive is the trial outcome, the more aggressive are the attorneys in court.

6 The effect of career concerns on the conflict of interest between the plaintiff and her attorney

As described in Dana and Spier (1993), "contingent fees are the most pervasive form of payment in personal injury and medical malpractice litigation." As they also explain, contingent fees are rarely used by defendants. Contingent fees provide insufficient incentives for the attorney, whose optimal effort level is below the plaintiff's aim (Polinsky and Rubinfeld, 2003). To examine the effect of career concerns on this misalignment of interests, I assume that AP is compensated through a contingent fee while the defendant has aligned interests with her client. The alignment of interests may arise if there is a repeated interaction between the defendant and her attorney. For instance, in a large number of cases, defendants are corporations with in-house lawyers or that have a long-term contractual relationship with a specific law firm.

Thus, I assume that AP is compensated only if she wins the trial and that AD has aligned interests with her client. For simplicity, I assume that the attorneys' cost functions and the priors on their talents coincide. Denoting by $\alpha \in (0,1]$ the exogenously-given[16] fraction of the Court award kept by AP, then AP chooses the level of effort in order to solve the following problem:

$$\max_{e_P\in[0,1]} \alpha W \cdot E_t(\Phi(e_P, e_D^*, t_P, t_D)) - \frac{ce_P^2}{2} + \beta_P \cdot \{E_t(\Phi(e_P, e_D^*, t_P, t_D)) \cdot \hat{t}_P(AP\ wins; e_P^*, e_D^*)$$
$$+E_t(1 - \Phi(e_P, e_D^*, t_P, t_D)) \cdot \hat{t}_P(AP\ loses; e_P^*, e_D^*)\},$$

where e_P^* denotes the market's conjecture about AP's equilibrium effort when she is compensated via a contingent fee, and e_D^* denotes AP's and the market's conjecture about AD's equilibrium level of effort when AP is compensated via a contingent fee. Following the same procedure as in Section 3, the interior optimal level of effort, e_P^*, must then satisfy[17]:

$$\frac{\alpha W \mu}{2} = e_P^* \left(c - \frac{\beta_P \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right). \tag{22}$$

[16] I consider α to be exogenous in the present stage of the game wherein attorneys are choosing effort levels. Solving by backwards induction allows me to endogeneize α if I introduce an initial contractual stage between AP and P, prior to the settlement stage. Notice that modeling the contractual stage requires having the results for the effort choice and for the settlement stage.

[17] In order to ensure that in equilibrium $e_P^* \in (0,1)$, I assume that $c > \alpha W\mu/2 + \beta_P \mu\sigma^2/(1-\mu^2)$. For the case of AD, I assume $c > \alpha W\mu/2 + \beta_D \mu\sigma^2/(1-\mu^2)$ as in Section 3.

Since AD's interests are aligned with her clients' interests, then e_D^* satisfies the same condition as in Section 3:

$$\frac{W\mu}{2} = e_D^* \left(c - \frac{\beta_D \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right). \tag{23}$$

In any possible equilibrium[18] both conditions are satisfied which leads to:

$$\frac{e_P^*}{\alpha} \left(c - \frac{\beta_P \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right) = e_D^* \left(c - \frac{\beta_D \mu \sigma^2}{1 - \mu^2 (e_P^* - e_D^*)^2} \right). \tag{24}$$

Notice that when AP has no career concerns (i.e., $\beta_P = 0$), then $e_P^* = \alpha W \mu / 2c$. This level of effort is a lower bound of e_P^* since for any $\beta > 0$, the expression in parentheses in equation (24) is smaller than c. Notice also that when AD has no career concerns (i.e., $\beta_D = 0$), then $e_D^* = W\mu/2c$. When $\beta_P = \beta_D = 0$, there are no strategic interactions between the attorneys.

When $\beta_P = \beta_D$, then $e_P^* = \alpha e_D^*$. Intuitively, since AP is obtaining only a fraction α of the Court award, her incentives are lower than those of AD. Therefore, in equilibrium AD exerts higher effort than AP. As a consequence, the expected probability that AP prevails in Court is $E\{\Phi^*\} < 1/2$.

Alternatively, when $\beta_P > \beta_D$ then $e_P^* > \alpha e_D^*$. These has implications for the plaintiff's payoff, $(1-\alpha)WE\{\Phi^*\}$, as shown in the following Proposition.

Proposition 9 *When AP is compensated through a contingent fee, and AD has aligned interests with her client (given everything else equal) and starting from $\beta_P = \beta_D = \beta$, an increase in β_P holding β_D fixed implies that:*
i) AP's equilibrium effort level, e_P^*, increases and AD*'s equilibrium effort, e_D^*, decreases. Thus, $E\{\Phi^*\}$ increases.*
ii) The plaintiff's payoff increases.

Proof. See the Appendix. ■

Therefore, career concerns may help align the interests between the plaintiff and her client. However, the career concerns of the opposing lawyer matter. Moreover, a larger β_P increases the effort costs of the attorney and thus, it does not necessarily increase AP's payoff. As a consequence, it could affect the misalignment of interests in settlement described in Miller (1987).

Misaligned interests in the settlement stage arise because an attorney compensated through a contingent fee pays all the costs in the event of trial. Thus, the concession limit of the attorney is lower than the concession limit of the plaintiff when the lawyer exerts a strictly positive level of effort. I assume for simplicity that the contingent fee is the same in case of settlement and in case of trial. Then, the plaintiff's concession limit is given by:

$$(1-\alpha)S \geq (1-\alpha)WE\{\Phi^*\}.$$

[18] It may be that more than one pair (e_P^*, e_D^*) satisfies the conditions above.

In contrast, AP is willing to accept the defendant's settlement offer as long as:

$$\alpha S \geq \alpha W E\{\Phi^*\} - \frac{c(e_P^*)^2}{2}.$$

Therefore AP's concession limit is necessarily smaller than her client's concession limit when $e_P^* > 0$. More specifically, for any settlement offer:

$$S \in \left(W E\{\Phi^*\} - \frac{c(e_P^*)^2}{2\alpha}, \quad W E\{\Phi^*\} \right),$$

AP is willing to accept S and avoid going to trial, while her client is better off by going to court.

Since stronger career concerns (i.e., larger β_P) implies that AP exerts more effort in equilibrium, this implies a larger range of settlement offers for which the interests of the attorney and her client are misaligned. Notice that the difference between P's and AP's concession limits is $c(e_P^*)^2/2\alpha$ which is increasing in AP's effort level. Career concerns also affect the attorneys' effort and settlement decisions when they are compensated on an hourly fee basis and the clients cannot observe the attorneys' effort levels. This case can be modeled using a framework as in Garoupa and Gomez (2008).

7 Conclusion

As shown in this paper, when lawyers have career concerns, their equilibrium effort levels increase and strategic effects in their decisions arise. Moreover, stronger career concerns increase the surplus from settlement, affect the parties' concession limits and may affect the bargaining outcome. In particular, if a party has a larger bargaining power than the other party, stronger career concerns reinforce such advantage and lead to an even more beneficial settlement agreement. For instance, if the defendant has all the bargaining power (as shown by Schwartz and Wickelgren (2000) the outcome of this case coincides with the outcome of an alternating-offer bargaining game with an indefinite number of possible offers and counter-offers), hiring a lawyer with stronger career concerns than the plaintiff's lawyer may be beneficial for the defendant because it leads to a decrease in the settlement outcome.

This paper contributes to the career concerns literature by studying a model with two opposing agents where performance is determined by a contest success function. A lawyer is then not only affected by her own career concerns, but also by the career concerns of her opponent. Consequently, there are interesting interaction effects between the parties. For instance, hiring a lawyer with strong career concerns may help align the interest between the plaintiff and her lawyer; however, such alignment depends on how strong are the career concerns relatively to the opposing lawyer.

Throughout the paper I have assumed that attorneys do not have private information about their own talents. This assumption is reasonable for inexperienced lawyers; however, lawyers obtain information about their capabilities as they gain experience. The analysis done in this paper could be extended to attorneys observing a private and noisy signal about their own talent. In addition, I have assumed that when two attorneys perform the same (in terms of the product of effort and talent), they are equally likely to win the trial. However, some cases have different merits than others. Career concerns may affect the type of case that attorneys accept. Being able to win a difficult case may enhance significantly the career of a lawyer. In addition, the negative impact of losing the case on the attorney's career may be small if the case was difficult. Therefore, the decision of whether to take a case or not may be more related to implicit career incentives (e.g., the prospect of earnings growth upon winning) than to explicit incentives (e.g., the expected compensation of the attorney). Finally, further analysis may examine the effect of career concerns on the contractual stage between attorneys and clients. In particular, it would be interesting to determine when stronger career concerns imply that the plaintiff's attorney is willing to accept a lower contingent fee.

Appendix

Derivation of the market's inference about t_P and t_D:

This part of the Appendix contains the derivation of the difference in market's inference about t_P and t_D. Following Bayes' rule, the market's inference about t_P when AP wins can be rewritten as:

$$\begin{aligned}
\hat{t}_P(AP\ wins; e_P^*, e_D^*) &= \tau_P^h \cdot \Pr\{\tau_P^h \mid AP\ wins\} + \tau_P^l \cdot \Pr\{\tau_P^l \mid AP\ wins\} = \\
&= \frac{\tau_P^h \cdot \Pr\{AP\ wins|\tau_P^h\}\Pr\{\tau_P^h\}}{\Pr\{AP\ wins\}} + \frac{\tau_P^l \cdot \Pr\{AP\ wins|\tau_P^l\}\Pr\{\tau_P^l\}}{\Pr\{AP\ wins\}} \\
&= \tau_P^h \cdot \frac{\rho_P E_{t_D}(\Phi(e_P^*, e_D^*, t_D; t_P = \tau_P^h)}{E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} + \tau_P^l \cdot \frac{(1-\rho_P) E_{t_D}(\Phi(e_P^*, e_D^*, t_D; t_P = \tau_P^l)}{E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} \\
&= \frac{\mu_P - e_D^* \mu_P \mu_D + e_P^* \cdot \psi_P}{1 + (e_P^* \mu_P - e_D^* \mu_D)},
\end{aligned}$$

where $\psi_P = \rho_P(\tau_P^h)^2 + (1-\rho_P)(\tau_P^l)^2$.

Conversely, when AP loses:

$$\begin{aligned}
\hat{t}_P(AP\ loses; e_P^*, e_D^*) &= \tau_P^h \cdot \Pr\{\tau_P^h \mid AP\ loses\} + \tau_P^l \cdot \Pr\{\tau_P^l \mid AP\ loses\} = \\
&= \frac{\tau_P^h \cdot \Pr\{AP\ loses|\tau_P^h\}\Pr\{\tau_P^h\}}{\Pr\{AP\ loses\}} + \frac{\tau_P^l \cdot \Pr\{AP\ loses|\tau_P^l\}\Pr\{\tau_P^l\}}{\Pr\{AP\ loses\}} \\
&= \tau_P^h \cdot \frac{\rho_P(1 - E_{t_D}(\Phi(e_P^*, e_D^*, t_D; t_P = \tau_P^h))}{(1 - E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} + \\
&\quad + \tau_P^l \cdot \frac{(1-\rho_P)(1 - E_{t_D}(\Phi(e_P^*, e_D^*, t_D; t_P = \tau_P^l))}{(1 - E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} \\
&= \frac{\mu_P + e_D^* \mu_P \mu_D - e_P^* \cdot \psi_P}{1 - (e_P^* \mu_P - e_D^* \mu_D)}.
\end{aligned}$$

Therefore, letting $e_P^* \mu_P - e_D^* \mu_D$ be K:

$$\hat{t}_P(AP\ wins; e_P^*, e_D^*) - \hat{t}_P(AP\ loses; e_P^*, e_D^*) =$$

$$\begin{aligned}
&= \frac{\mu_P - e_D^* \mu_P \mu_D + e_P^* \cdot \psi_P - K(\mu_P - e_D^* \mu_P \mu_D + e_P^* \cdot \psi_P)}{(1+K)\cdot(1-K)} + \\
&\quad + \frac{-\mu_P - e_D^* \mu_P \mu_D + e_P^* \cdot \psi_P - K(\mu_P + e_D^* \mu_P \mu_D - e_P^* \cdot \psi_P)}{(1+K)\cdot(1-K)} \\
&= \frac{2e_P^* \cdot \psi_P - 2e_D^* \mu_P \mu_D - 2K\mu_P}{1 - K^2} =
\end{aligned}$$

$$= \frac{2e_P^* \cdot \psi_P - 2e_D^* \mu_P \mu_D - 2\mu_P(e_P^* \mu_P - e_D^* \mu_D)}{1-(e_P^* \mu_P - e_D^* \mu_D)^2} =$$
$$= \frac{2e_P^*(\psi_P - \mu_P^2)}{1-(e_P^* \mu_P - e_D^* \mu_D)^2} = \frac{2e_P^* \sigma_P^2}{1-(e_P^* \mu_P - e_D^* \mu_D)^2}.$$

Regarding the defendant's attorney, the market's inference about t_D when AP loses can be rewritten as:

$$\begin{aligned}
\hat{t}_D(AP\ loses; e_P^*, e_D^*) &= \tau_D^h \cdot \Pr\{\tau_D^h \mid AP\ loses\} + \tau_D^l \cdot \Pr\{\tau_D^l \mid AP\ loses\} = \\
&= \tau_D^h \cdot \frac{\rho_D(1 - E_{t_P}(\Phi(e_P^*, e_D^*, t_P; t_D = \tau_D^h))}{(1 - E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} + \\
&\quad + \tau_D^l \cdot \frac{(1-\rho_D)(1 - E_{t_P}(\Phi(e_P^*, e_D^*, t_P; t_D = \tau_D^l))}{(1 - E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} = \\
&= \frac{\mu_D - e_P^* \mu_P \mu_D + e_D^* \cdot \psi_D}{1-(e_P^* \mu_P - e_D^* \mu_D)}.
\end{aligned}$$

where $\psi_D = \rho_D(\tau_D^h)^2 + (1-\rho_D)(\tau_D^l)^2$.

Conversely, when AP wins:

$$\begin{aligned}
\hat{t}_D(AP\ wins; e_P^*, e_D^*) &= \tau_D^h \cdot \Pr\{\tau_D^h \mid AP\ wins\} + \tau_D^l \cdot \Pr\{\tau_D^l \mid AP\ wins\} = \\
&= \tau_D^h \cdot \frac{\rho_D \cdot E_{t_P}(\Phi(e_P^*, e_D^*, t_P; t_D = \tau_D^h))}{E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} + \\
&\quad + \tau_D^l \cdot \frac{(1-\rho_D) E_{t_P}(\Phi(e_P^*, e_D^*, t_P; t_D = \tau_D^l)}{E_t(\Phi(e_P^*, e_D^*, t_P, t_D))} \\
&= \frac{\mu_D + e_P^* \mu_P \mu_D - e_D^* \cdot \psi_D}{1+(e_P^* \mu_P - e_D^* \mu_D)}.
\end{aligned}$$

Therefore, again letting $e_P^* \mu_P - e_D^* \mu_D$ be K:

$$\hat{t}_D(AP\ loses; e_P^*, e_D^*) - \hat{t}_D(AP\ wins; e_P^*, e_D^*) =$$

$$= \frac{\mu_D - e_P^* \mu_P \mu_D + e_D^* \cdot \psi_D + K(\mu_D - e_P^* \mu_P \mu_D + e_D^* \cdot \psi_D)}{(1+K)\cdot(1-K)} +$$
$$+ \frac{-\mu_D - e_P^* \mu_P \mu_D + e_D^* \cdot \psi_D + K(\mu_D + e_P^* \mu_P \mu_D - e_D^* \cdot \psi_D)}{(1+K)\cdot(1-K)}$$

$$= \frac{e_D^* \cdot \psi_D - 2e_P^* \mu_P \mu_D + 2\mu_D(e_P^* \mu_P - e_D^* \mu_D)}{1-K^2} =$$
$$= \frac{2e_D^*(\psi_D - \mu_D^2)}{1-(e_P^* \mu_P - e_D^* \mu_D)^2} = \frac{2e_D^* \sigma_D^2}{1-(e_P^* \mu_P - e_D^* \mu_D)^2}.$$

Proof of Proposition 4:

To compare the equilibrium effort levels in the case of asymmetric priors with the equilibrium effort levels of the symmetric case, I will denote the former as $e_i^*$and e_j^*, while e^* denotes the latter.
i) Since $\mu_i = \mu_j$, then:

$$\frac{W\mu}{2} = e_j^* \left(c - \frac{\beta\mu\sigma_j^2}{1-\mu^2(e_P^* - e_D^*)^2} \right) = e_j^* \left(c - \frac{\beta\mu\sigma_i^2}{1-\mu^2(e_P^* - e_D^*)^2} \right).$$

Thus, $\beta\mu\sigma_j^2 < \beta\mu\sigma_i^2$ implies that $e_j^* < e_i^*$.
ii) Comparing the first-order conditions of the asymmetric priors case with the first-order conditions of the symmetric case for j:

$$\frac{W\mu}{2} = e_j^* \left(c - \frac{\beta\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2} \right) = e^* \left(c - \beta\mu\sigma^2 \right).$$

Thus, $e_j^* > e^*$. Since $e_j^* < e_i^*$ as shown in part i), then $e^* < e_i^*$.

Derivation of the market's inference about t_P and t_D given a level of sensitivity s:

This part of the Appendix contains the derivation of the difference in the market's inference about t_P and t_D considering the sensitivity of the trial's outcome to the performance of the attorneys, s. Letting ε_i denote se_i, then Φ takes the form:

$$\Phi(e_P, e_D, t_P, t_D) = \frac{1 + \varepsilon_P t_P - \varepsilon_D t_D}{2},$$

which is equivalent to the form used above to compute the market's inference about t_P and t_D when $s = 1$. Thus

$$\hat{t}_P(AP\ wins; e_P^*, e_D^*) - \hat{t}_P(AP\ loses; e_P^*, e_D^*) =$$
$$= \frac{2\varepsilon_P^*\sigma_P^2}{1-(\varepsilon_P^*\mu_P - \varepsilon_D^*\mu_D)^2} = \frac{2se_P^*\sigma_P^2}{1-s^2(e_P^*\mu_P - e_D^*\mu_D)^2},$$

and similarly:

$$\hat{t}_D(AP\ loses; e_P^*, e_D^*) - \hat{t}_D(AP\ wins; e_P^*, e_D^*) =$$
$$= \frac{2\varepsilon_D^*\sigma_D^2}{1-(\varepsilon_P^*\mu_P - \varepsilon_D^*\mu_D)^2} = \frac{2se_D^*\sigma_D^2}{1-s^2(e_P^*\mu_P - e_D^*\mu_D)^2}.$$

Proof of Proposition 8:

Using the expressions found above in Case 3 for $\hat{t}_P(AP\ wins; e_P^*, e_D^*)$, $\hat{t}_P(AP\ loses; e_P^*, e_D^*)$, $\hat{t}_D(AP\ wins; e_P^*, e_D^*)$, and $\hat{t}_D(AP\ loses; e_P^*, e_D^*)$, the derivatives with respect to s are:

$$\frac{\partial\hat{t}_P(AP\ wins; e_P^*, e_D^*)}{\partial s} = \frac{e_P\sigma_P^2}{(1+s(e_P\mu_P - e_D\mu_D))^2} > 0;$$

$$\begin{aligned}
\frac{\partial \hat{t}_P(AP\ loses; e_P^*, e_D^*)}{\partial s} &= \frac{-e_P\sigma_P^2}{(1-s(e_P\mu_P - e_D\mu_D))^2} < 0 \\
\frac{\partial \hat{t}_D(AP\ wins; e_P^*, e_D^*)}{\partial s} &= \frac{-e_D\sigma_D^2}{(1+s(e_P\mu_P - e_D\mu_D))^2} < 0 \\
\frac{\partial \hat{t}_D(AP\ loses; e_P^*, e_D^*)}{\partial s} &= \frac{e_D\sigma_D^2}{(1-s(e_P\mu_P - e_D\mu_D))^2} > 0
\end{aligned}$$

Finally, when $s = 0$, then career concerns have no effect because $\hat{t}_P(AP\ wins; e_P^*, e_D^*) - \hat{t}_P(AP\ loses; e_P^*, e_D^*) = \hat{t}_D(AP\ loses; e_P^*, e_D^*) - \hat{t}_D(AP\ wins; e_P^*, e_D^*) = 0$.

Proof of Proposition 9:

i) First, if $\beta_P > \beta_D$ it must be that $e_P^* > \alpha e_D^*$. Notice that $e_P^* = \alpha e_D^*$ is not possible as it can be shown by contradiction. If it was possible then:

$$\frac{e_P^*}{\alpha}\left(c - \frac{\beta_P\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2}\right) = e_D^*\left(c - \frac{\beta_P\mu\sigma^2}{1-\mu^2(e_D^*(\alpha-1))^2}\right).$$

But then:

$$e_D^*\left(c - \frac{\beta_P\mu\sigma^2}{1-\mu^2(e_D^*(\alpha-1))^2}\right) > e_D^*\left(c - \frac{\beta_D\mu\sigma^2}{1-\mu^2(e_D^*(\alpha-1))^2}\right),$$

which contradicts equation (26). Similarly, if $e_P^* < \alpha e_D^*$ then again for $\beta_P > \beta_D$:

$$\frac{e_P^*}{\alpha}\left(c - \frac{\beta_P\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2}\right) < e_D^*\left(c - \frac{\beta_P\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2}\right),$$

which would also contradict equation (26).

Therefore, if β_P increases above β_D , then $(e_P^* - e_D^*)^2$ decreases. Hence, since β_D remains fixed it must be that e_D^* decreases in order to satisfy:

$$\frac{W\mu}{2} = e_D^*\left(c - \frac{\beta_D\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2}\right).$$

In addition, e_P^* must increase in order to satisfy:

$$\frac{\alpha W\mu}{2} = e_P^*\left(c - \frac{\beta_P\mu\sigma^2}{1-\mu^2(e_P^* - e_D^*)^2}\right),$$

given that $(e_P^* - e_D^*)^2$ decreases and β_P increases.

ii) The plaintiff's payoff is given by:

$$(1-\alpha)WE\{\Phi^*\} = (1-\alpha)W\left(\frac{1}{2} + \frac{\mu(e_P^* - e_D^*)}{2}\right).$$

Thus, increase in β_P holding β_D, increases $E\{\Phi^*\}$ and the plaintiff's payoff.

References

BAIK, K.H. and KIM, I.-G. (2007) "Strategic Decisions on Lawyers' Compensation in Civil Disputes," *Economic Inquiry*, vol. 45, pages 854-863.

CHE, Y. and GALE, I. (2000) "Difference-Form Contests and the Robustness of All-Pay Auctions," *Games and Economic Behavior*, vol. 30, pages 22-43.

DANA, J. and SPIER, K. (1993) "Expertise and Contingent fees: The Role of Asymmetric Information in Attorney Compensation," *Journal of Law Economics and Organization*, vol. 9, pages 349-367.

DASGUPTA, A. and PRAT, A. (2008) "Information Aggregation in Financial Markets with Career Concerns," *Journal of Economic Theory,* forthcoming.

DEWATRIPONT, M. JEWITT, I., and TIROLE, J. (1999a) "The Economics of Career Concerns, Part I: Comparing Information Structures," *Review of Economic Studies*, vol. 66, pages 183-198.

DEWATRIPONT, M. JEWITT, I., and TIROLE, J. (1999b) "The Economics of Career Concerns, Part II: Application to Missions and Accountability of Government Agencies," *Review of Economic Studies,* vol. 66, pages 199-217.

DEWATRIPONT, M. and TIROLE, J. (1999) "Advocates," *Journal of Political Economy*, vol. 107, pages 1-39.

FAMA, E.F. (1980) "Agency Problems and the Theory of the Firm." *Journal of Political Economy*, vol. 88, pages 288-307.

FARMER, A. AND PECORINO, P. (1999) "Legal expenditure as a rent-seeking game," *Public Choice*, vol. 100, pages 271-288.

FARMER, A. AND PECORINO, P. (2000) "Does jury bias matter," *International Review of Law and Economics*, vol. 20, pages 315-328.

FERRER, R. (2008) "The determinants of weekly hours of work among young lawyers," working paper.

FINGLETON, J. and RAITH, M. (2005) "Career Concerns of Bargainers," *Journal of Law, Economics and Organization*, vol. 21, No. 1, pp. 179-204.

GAROUPA, N. and GOMEZ, F. (2008) "Cashing by the Hour: Why Large Lawfirms Prefer Hourly Fees over Contigent Fees" *Journal of Law, Economics and Organization*, vol. 24, pages 458-475.

GLENDON, M. A., GORDON, M. W. AND OSAKWE, C. (1982) "Comparative Legal Traditions in a Nutshell," Saint Paul, Minn.: West. Publishing Co.

GIBBONS, R. and MURPHY, K.J. (1992) "Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence," *Journal of Political Economy*, vol. 100, pages 468-505.

HARBAUGH, R. (2006) "Prospect Theory or Skill Signaling?," Claremont Colleges Working Paper No. 2002-03, available at SSRN: http://ssrn.com/abstract=311409.

HIRSHLEIFER, J. (1989) "Conflict and rent-seeking success functions: Ratio vs. difference models of relative success," *Public Choice*, vol. 63, pages 101-112.

HIRSHLEIFER, J. and OSBORNE, E. (2001) "Truth, Effort, and the Legal Battle," *Public Choice*,

vol. 108, pages 169-195.
HOLMSTRÖM, B. (1982, 1999) "Managerial Incentive Problems: a Dynamic Perspective," *Review of Economic Studies*, vol. 66, pages 169-183.
KATZ, A. (1988) "Judicial Decision making and Litigation Expenditure," *International Review of Law and Economics*, vol. 8, pages 127-143.
LANDERS, R.M, REBITZER, J.B., and TAYLOR, L.J. (1996) "Rat Race Redux: Adverse Selection in the Determination of Work Hours in Law Firms" *American Economic Review*, Vol. 86, pages 329-348.
LEVY, G. (2005) "Careerist judges and the appeals process," *RAND Journal of Economics*, vol. 36, pages 275-297.
MILBOURN, T.T., SHOCKLEY, R.L. and THAKOR, A. V. (2001) "Managerial career concerns and investments in information" *RAND Journal of Economics*, vol. 32, pages 334-351.
MILLER, G.P. (1987) "Some Agency Problems in Settlement," *Journal of Legal Studies*, vol. 16, pages 189-215.
NASH, J. (1950) "The Bargaining Problem," *Econometrica*, vol. 18, pages 155-162.
POLINSKY, A. M. and RUBINFELD, D. (2001) "Aligning the Interests of Lawyers and Clients," *American Law and Economics Review*, vol. 5, pages 165-188.
RUBINFELD, D. and SCOTCHMER, S. (1993) "Contingent Fees for Attorneys: An Economic Analysis," *RAND Journal of Economics*, vol. 24, pages 343-356.
ROSEN, S. (1992) "The Market for Lawyers," *Journal of Law and Economics*, vol. 35, No.2., pages 215-246.
SCHARFSTEIN D. and STEIN, J. (1990) "Herd Behavior and Investment," *American Economic Review*, vol. 80, pages 465-479.
SCHWARTZ, W.F. and WICKELGREN, A.L. (2009) "Advantage Defendant: Why Sinking Litigation Costs Makes Negative Expected Value Defenses, but not Negative Expected Value Suits Credible," *Journal of Legal Studies* (forthcoming).
SKAPERDAS, S.(1996) "Contest success functions," *Economic Theory*, vol. 7, pages 283-290.
SPIER, K. (2007) "Litigation," *Handbook of Law and Economics*, chapter 4, vol. 1, pages 312-313, ed. by A. Mitchell Polinsky and S. Shavell. Published by North-Holland.
WÄRNERYD, K. (2000) "In Defense of Lawyers: Moral Hazard as an Aid to Cooperation," *Games and Economic Behavior*, vol. 33, pages 145-158.