

Rent Seeking and Bias in Appeals Systems*

Tim Friehe

University of Marburg

Ansgar Wohlschlegel

University of Portsmouth

May 6, 2016

Abstract

We analyze a contest setup in which two parties try to persuade an authority and the losing party may appeal to a higher authority. In our setup, the higher authority's judgment depends on the initial judgment, the merits of the contestants' arguments, and parties' effort at the appeals stage. With regard to the first contest, the possibility of appealing to the higher authority induces the favorite to invest more effort than the underdog and raises the favorite's winning probability to a level in excess of what the quality of the arguments would justify. Surprisingly, the possibility of appeal may raise efficiency by leading to lower total contest effort. However, even in scenarios that yield a total effort that is higher than in a single-level system, the possibility of appeal may promote meritorious cases to be brought.

JEL Classification: K41; D72

Keywords: Appeals; Litigation; Justice; Contest; Effort.

*We would like to thank seminar participants in Portsmouth for helpful suggestions. Financial Support by the British Academy / Leverhulme Trust Small Research Grant scheme is gratefully acknowledged.

1 Introduction

A growing overload of judicial systems, surging litigation costs, and concerns about access to justice being restricted to litigants with deep pockets has sparked a debate on how to improve the efficiency and justice of the legal system. The right to and scope of appeal has been center stage in much of this discussion. For instance, the CEPEJ (2014) specifically promotes the use of alternative dispute resolution to reduce courts' workload and ease access to justice, where some forms of these alternative procedures explicitly exclude appeal. However, restricting the right to appeal involves a trade-off: While the possibility of appeal tends to prolong cases, clog the legal system, and make litigation more expensive, it has the important function of correcting legal errors of lower-level courts (e.g., Shavell 1995, 2006).

In this paper, we study the impact of appeals systems on rent-seeking incentives, the relationship between the resolution of disputes and the underlying facts, and the incentives to bring the case. The analysis is set in the context of litigation, but the issues dealt with in our analysis are important in other contexts as well. People affected by the decisions of public bodies are usually protected by the right of appeal. For example, parents may appeal school allocation decisions. Moreover, private organizations often implement appeal systems to ensure that employees affected by these decisions are treated fairly.¹

More specifically, we consider a setup in which both the merits of the case and the parties' effort levels influence the trial court's judgment in a litigation contest. The losing litigant may file appeal, thereafter the victorious litigant may decide whether to defend her case. If so, the case is tried in the appeals court, which will decide according to a contest success function similar to that of the trial court, the difference being that not only the merits and efforts but also the trial court's judgment will impact on the appeal court's judgment. We are particularly interested in how appeals influence the truth-finding and rent-seeking aspects of litigation in equilibrium. Moreover, we seek to shed light on how the possibility of appeal bears on incentives to file the case. Our starting point for our analysis is the classic litigation contest setup introduced in Hirshleifer and Osborne (2001), which we complement by a second contest stage that results only when both parties call for it.

We find that the possibility of appeal induces the litigant with the better case to spend more effort in the court of first instance than the other litigant. This results from an asymmetry of what is at stake in trial court for the plaintiff and defendant.

¹In fact, allowing employees to appeal is part of codes of practice set by organizations such as ACAS in the UK (e.g., ACAS (2015)), and may involve resorting to external tribunals.

Litigants will anticipate that the favorite's (underdog's) winning in trial court will reduce (increase) both litigants' rent seeking incentives in the appeals stage. The fact that higher anticipated efforts move litigants' stakes in trial in opposite directions (as they lower the benefit from winning for the plaintiff but make winning all the more important for the defendant) then implies asymmetric rent-seeking incentives in trial. This asymmetry in litigation efforts distorts the winning probabilities away from what the quality of the cases would justify. In other terms, in our setup, the possibility of appeal indeed harms justice in many circumstances.

Turning to the total litigation effort, we find that the intuition that the possibility of appeals increases effort is confirmed in many, but not all circumstances. In other terms, there are circumstances in which the two-stage litigation creates less rent-seeking than the one-stage benchmark model. We thereby highlight that the workings of appeal systems are more complex than is commonly understood because – in a very simple model – we are able to establish the surprising result that appeals may harm justice and imply lower litigation costs.

Last, we compare incentives to use each level of jurisdictions to the incentives in a single-level judicial system. We show that a victorious plaintiff benefits from the winner's head start in the appeals compared to a single-level system, which is not true for victorious defendants when the merits of the case are sufficiently strongly in favor of the plaintiff. In contrast, losing in trial court implies lower benefits for both contestants than in a single-level system. As for the decision to bring suit in the first place, we find that the possibility of appeals may increase access to justice for plaintiffs with highly meritorious cases even if total rent seeking (i.e., equilibrium effort) is higher than in a single-level system.

This paper is related to three strands of literature. First, we consider the impact of the possibility of appeals on litigants' choices. Most of the existing economic literature on appeals is concerned with their effect on judges' choices (for instance, Spitzer and Talley (2000), Daughety and Reinganum (2000), Levy (2005), Shavell (2007), Shavell (2006) or Iossa and Palumbo (2007)) or focuses on the losing litigant's incentives to file appeal (Shavell (1995), Shavell (2010)). The only exception that we are aware of is Wohlschlegel (2014), who analyzes the effect of the appeals system on pretrial and posttrial settlement bargaining by asymmetrically informed litigants, taking litigation costs as given. By contrast, we endogenize litigation costs while assuming for simplicity that litigants are symmetrically informed and cannot settle out of court. Hence, both papers are complementary.

Second, we adopt the notion that litigation can be conceptualized as a (potentially biased) contest. Katz (1988) introduced the argument that the merits of the case will

interact with parties' litigation effort with respect to the trial outcome in a way that can be represented by a contest success function with a bias. The use of a biased contest success function is by now well-established in the related literature. For example, Chen and Wang (2007) rely on it when they explore fee-shifting rules with contingency fees, and Bernardo, Talley, and Welch (2000) – in their study of legal presumptions within the corporate and commercial context – are interested in the influence of the bias on ex-ante incentives and costly litigation. Farmer and Pecorino (1999) make use of Katz's biased contest success function to analyze differences between the American rule of allocating legal costs and the English one, also elaborating on litigants' participation constraints.² In much of the literature on litigation contests, participation constraints are not treated explicitly (see, e.g., Baik and Kim (2007a), Baik and Kim (2007b), Parisi (2002), Wärneryd (2000)), but they will be important for our analysis. Hirshleifer and Osborne (2001) introduce a Litigation Success Function that parameterizes the degree of fault satisfying certain sensible features, and propose a normative criterion of *justice* that is best served when the plaintiff' winning probability fully reveals the merits of the plaintiff's case. We will adopt their Litigation Success Function (LSF) and refer to their normative criterion in our analysis.

Last, since we analyze a model in which litigants may interact in two litigation contests, the trial stage and the appeal stage, our analysis is related to the theoretical literature on dynamic contests. Repeated contests have been considered in the literature on contests. Münster (2009), for example, considers the case in which two contestants with private information about their valuation of winning the contest interact in two rounds where a price is won in each round. In contrast to this and other contributions with a dynamic setting such as Powell (2007) and Slantchev (2010), parties are symmetrically informed in our setup. In a model with symmetric information, Yildirim (2005) finds that the result about the underdog moving first and the favorite moving second in contest games with endogenous timing no longer results when parties may expend effort in stage 1 and stage 2 after having observed first-stage effort and the contest is determined by total effort. In our model, litigants must invest effort to influence the probability of winning at trial court and then again in order to convince the appeal court (if that stage is reached at all). Gershkov and Perry (2009) consider a designer who seeks to maximize litigation effort in a two-stage two-agent tournament and may use a midterm review in addition to the final review. They establish, for instance, that the weight that should be assigned to the midterm review in determining the agents' ranking should be the smaller

²Luppi and Parisi (2012) provide an analysis of litigation effort and participation choices closely related to that by Farmer and Pecorino (1999), however, focusing on the common law efficiency hypothesis and using a contest success function without bias.

the more effective the first-stage effort is in determining the final review's outcome.

The paper is organized in the following way: Section 2 presents the model assumptions. In section 3, the equilibrium is determined for different parameter constellations. These results are used in section 4 to discuss the impact of the appeals system on justice, equilibrium rent seeking incentives and access to justice. Section 5 summarizes and discusses possible extensions.

2 The Model

We analyze a plaintiff's ('she') and a defendant's ('he') decisions of how much effort to expend in litigation that may comprise a trial and an appeals stage, along with the plaintiff's decision of whether to file suit and the losing litigant's decision of whether to file appeal. The litigation concerns the possible payment of a fixed judgment from the defendant to the plaintiff. The trial and appeals judgments will depend stochastically on both litigants' effort choices and the merits of the case, which is unknown to both courts but perfectly observable by both litigants. In addition to the merits of the case, the appeals court's judgment will also directly depend on the trial court's judgment.

Timing The game consists of the following steps:

1. Filing suit: The plaintiff decides whether to file suit, and the defendant decides whether to defend himself.
2. Trial: Litigants invest effort in trial, and the trial judgment is determined and announced.
3. Filing appeal: The litigant who lost in trial decides whether to file appeal, and the winning litigant decides whether to actually go to court if appeal has been filed.
4. Appeal: Litigants invest effort in appeals court, and the appeals judgment is determined and announced.
5. Payoffs are realized.

In stage 1, we are considering the following sequence of steps: The plaintiff first decides whether to file suit. If she does not, the game ends with no damages being paid, whereas if she does, the defendant chooses whether or not to defend himself. If he does not, the game ends, and he pays damages to the plaintiff. If he does, the plaintiff decides whether to indeed take the case to court or to withdraw. If she withdraws, the game ends with no damages being paid. If she takes the case to court, the game proceeds to stage 2. Using

this microstructure for the filing stages 1 and 3, we are taking account of the fact that there is little commitment power. For instance, a plaintiff might bring suit even if the lawsuit has negative expected value for her, hoping the defendant won't defend himself if his expected payoff from going to court is also negative (which may be the case if court fees and equilibrium efforts are high). In our setup, such an action would not be credible, since the plaintiff can withdraw the action should the defendant decide to defend himself, which the defendant will anticipate and defend himself even if the lawsuit had negative expected value for him.³

In stage 2, plaintiff and defendant simultaneously determine trial litigation efforts p_T and d_T , respectively. Litigation effort is a one-dimensional index of inputs such as attorney hours, pages of documentation, etc. We abstract from any agency issues in the litigant-attorney relationship (see, e.g., Wärneryd (2000)). Stage 2 is concluded by a move of nature regarding the trial court's judgment according to a contest success function specified below.

In stage 3, the sequence of stage 1 is repeated where the party defeated in trial first decides whether to bring the appeal, the victorious litigant in trial chooses whether or not to defend in front of the appeals court, and the defeated party ultimately decides about actually filing the appeal.

In stage 4, plaintiff and defendant simultaneously determine appeals litigation efforts p_A and d_A , respectively. The appeal court's decision results from a contest success function where both the merits of the case and the trial court's judgment interact with contest effort.

The Contest Success Function at the Trial and the Appeals Stage We build upon previous analyses of litigation contests by considering the possibility of appeal. With regard to the trial court's judgment, we follow the previous literature and assume that the plaintiff's winning probability is⁴

$$\pi_T(p_T, d_T, Y) = \frac{p_T^\tau Y}{p_T^\tau Y + d_T^\tau (1 - Y)}, \quad (1)$$

where $Y \in (0, 1)$ represents the level of defendant fault, that is, the merits of the plaintiff's case. Note that the standard approach in this literature, which we adopt, is to view courts as "black boxes" deciding cases with the aforementioned probability rather than as active decision-makers. The force exponent $\tau \in (0, 1]$ weights the relative importance of effort versus fault in determining the trial outcome.

³A similar game structure is also used by Nalebuff (1987) in order to impose credibility of pretrial settlement offers.

⁴See, for instance, Farmer and Pecorino (1999) or Hirshleifer and Osborne (2001).

Turning to the eventual judgment of the appeal’s court, we assume that

$$\pi_A(p_A, d_A, Z(\ell)) = \frac{p_A^\alpha Z(\ell)}{p_A^\alpha Z(\ell) + d_A^\alpha (1 - Z(\ell))}, \quad (2)$$

where

$$Z(\ell) := \lambda \ell + (1 - \lambda)Y \quad (3)$$

denotes the strength of the plaintiff’s case in the appeals court. Thus, we follow the literature on litigation contests by assuming that the contest success function is biased, but we assume that this bias is not only based on the true merits Y of the case but also on the trial judgment ℓ , where $\ell = 1$ ($\ell = 0$) when the plaintiff (defendant) prevailed in trial court.⁵ $\lambda \in (0, 1)$ is the weight with which the trial judgment impacts on $Z(\ell)$.

The assumption that the trial judgment has a direct impact on the success probabilities in the appeals stage reflects the fact that, in reality, appeals decisions are never made completely independent of earlier decisions. The most obvious reason for this is that the purpose of appeals courts is to correct potential errors at the trial stage, and that the scope for this appellate error correction is limited by law in most jurisdictions.⁶ Furthermore, it appears likely that there will be a bias towards confirming the decision of the trial court due to, for example, respect for the other tribunal, an interest in establishing trust in verdicts, and an ingroup bias stemming from a shared identity with the other legal decision-maker. Since the impact of the trial judgment varies across jurisdictions,⁷ we use λ to measure the scope of appellate review. By allowing for different weights λ , we can therefore distinguish scenarios in which the appeals court is not very much constrained by the decision of and the facts established at the court of first instance (small levels of λ) from cases in which the lower court’s decision has a strong influence (high λ).

As another potential difference between success probabilities on trial and appeals levels, our model allows for the possibility that the appeals court’s decision may be influenced by effort to a lesser extent by having $\alpha \leq \tau$.

Payoffs The risk-neutral plaintiff and defendant litigate over the payment of damages normalized to 1. We will obtain circumstances in which the defendant agrees to transfer damages without creating additional costs (specifically, when the plaintiff wants to file

⁵Note that this potential bias does not make the appeals system inherently inaccurate. We will show that, for symmetric contest efforts, the ex-ante probability that the plaintiff wins a case that is appealed (i.e., the probability before suit is even filed) is Y , as is the probability for symmetric efforts in the standard, one-stage litigation.

⁶In the US, for instance, the Seventh Amendment of the Constitution confines error correction by appeals courts to questions of law rather than facts previously determined by a jury.

⁷Civil law countries often allow for some new fact finding even in the appeals court, and some appellate fact finding has recently been observed even in the U.S. (Bassett (2002)).

the case but the defendant would rather not defend in trial court). But, more generally, parties will incur costs in the legal battle. The trial (appeal) stage is associated with fixed court costs amounting to c_T (c_A) for both litigants (i.e., we assume that the so-called American rule of cost allocation applies). Litigation effort creates linear costs in monetary terms precisely at the level of effort (i.e., we assume that the marginal effort cost is equal to one).

In summary, both litigants' payoffs are zero if the plaintiff does not file suit or withdraws the case, and the plaintiff's payoff is 1 and the defendant's is -1 if the plaintiff files suit but the defendant does not defend himself. If the case goes to trial, payoffs are

$$W_P(p_T; d_T) = \pi_T(p_T, d_T; Y)V_P^1 + (1 - \pi_T(p_T, d_T; Y))V_P^0 - p_T - c_T \quad (4)$$

$$W_D(d_T; p_T) = \pi_T(p_T, d_T; Y)V_D^1 + (1 - \pi_T(p_T, d_T; Y))V_D^0 - d_T - c_T, \quad (5)$$

where V_i^ℓ denotes litigant i 's continuation payoff after the trial has ended. In particular, $V_P^\ell = \ell = -V_D^\ell$ if appeal is not filed or withdrawn, $V_P^\ell = 1 - \ell = -V_D^\ell$ if appeal is filed but the victorious litigant in trial does not defend, and $V_P^\ell = \pi_A(p_A, d_A; Z(\ell)) - p_A - c_A =: A_P^\ell$ and $V_D^\ell = -\pi_A(p_A, d_A; Z(\ell)) - p_D - c_A =: A_D^\ell$ if the case actually goes to the appeals court.

3 Characterization of Equilibrium

We proceed by backward induction and suppose that the plaintiff had filed suit in stage 1, the trial court judgment was $\ell \in \{0, 1\}$, and the litigant who had lost in trial court filed appeal.

Effort in Appeals Court The subgame at the appeals stage is identical to the litigation contests discussed in Farmer and Pecorino (1999) and Hirshleifer and Osborne (2001), with $Z(\ell)$ representing the merits of the case, and damages at stake and the marginal cost of effort set equal to 1. Parties seek to

$$\max_{p_A} \pi_A(p_A, d_A, Y, \ell) - p_A \quad (6)$$

$$\max_{d_A} -\pi_A(p_A, d_A, Y, \ell) - d_A. \quad (7)$$

The following results obtain (as established in Hirshleifer and Osborne (2001), for example).

Proposition 1 *Given trial court judgment ℓ , there exists a unique equilibrium in pure strategies for the effort choices in the appeals court given by*

$$p_A^\ell = d_A^\ell = \alpha Z(\ell)(1 - Z(\ell)). \quad (8)$$

The plaintiff wins with probability $\pi_A = Z(\ell)$. Equilibrium payoffs in this subgame are

$$A_P^\ell = Z(\ell)[1 - \alpha(1 - Z(\ell))] - c_A \quad (9)$$

$$A_D^\ell = -Z(\ell)[1 + \alpha(1 - Z(\ell))] - c_A. \quad (10)$$

Equilibrium payoffs (9) and (10) are the continuation payoffs after trial for cases that go to the appeals court, as defined in Section 2.

Appeals Decision In this step, we analyze the decision by the litigant who lost in trial whether to file appeal, and the winning litigant's decision of whether to give in or to actually proceed to the appeals court, using backwards induction.

Suppose first that the defendant has won in trial ($\ell = 0$), the plaintiff has filed appeal, and the defendant has decided to defend himself. The plaintiff may either indeed take the case to the appeals court, which yields her A_P^0 , or withdraw the appeal, which yields her zero. Hence, the plaintiff will take the case to the appeals court if and only if $A_P^0 \geq 0$.

Consider now the defendant's decision of whether to defend himself after the plaintiff has filed appeal. Defending himself yields him A_D^0 if $A_P^0 \geq 0$, and zero if $A_P^0 < 0$. Alternatively, he may just agree to pay damages to the plaintiff without taking the case to the appeals court, in which case the payoff is -1 . Hence, the defendant will *not* defend himself if and only if $A_P^0 \geq 0$ and $A_D^0 < -1$.

Last, consider the plaintiff's decision of whether to file appeal. Not filing appeal yields her zero payoff with certainty. If $A_P^0 \geq 0$ and $A_D^0 < -1$, she anticipates that the defendant will not defend himself, so that filing appeal yields her a payoff of 1, which she prefers to not filing appeal. If $A_P^0 \geq 0$ and $A_D^0 \geq -1$, the case will go to court if she files appeal and yield her A_P^0 , which is positive by definition of this case, so that she strictly prefers filing appeal. If $A_P^0 < 0$ and the plaintiff files appeal, the defendant will defend himself, but the plaintiff will eventually withdraw the appeal. In this last case, the plaintiff is indifferent between filing and not filing appeal.⁸ However, no matter how she decides, the outcome of this substep will be that the case does not go to the appeals court, and she does not receive any damages.

The analysis is similar for the case that the plaintiff has won in trial ($\ell = 1$). If $A_D^1 \geq -1$, the defendant is always better off when filing appeal, no matter whether the plaintiff is anticipated to go to court or to give in. In the opposite case $A_D^1 < -1$, the defendant is indifferent between filing and not filing appeal, since he anticipates to withdraw the appeal eventually even if he files appeal, but he will pay damages without the case going to the appeals court.

⁸Recall that we disregard the pure filing costs for simplicity, and focus on the court fees for the actual court proceedings.

In summary, the continuation values of the game after stage 2 are, depending on the trial judgment ℓ :

$$V_P^0 = \begin{cases} \max\{A_P^0, 0\}, & \text{if } A_D^0 \geq -1; \\ 1, & \text{if } A_D^0 < -1 \text{ and } A_P^0 \geq 0; \\ 0, & \text{otherwise.} \end{cases} \quad (11)$$

$$V_D^0 = \begin{cases} \max\{A_D^0, -1\}, & \text{if } A_P^0 \geq 0; \\ 0, & \text{otherwise.} \end{cases} \quad (12)$$

$$V_P^1 = \begin{cases} \max\{A_P^1, 0\}, & \text{if } A_D^1 \geq -1; \\ 1, & \text{otherwise.} \end{cases} \quad (13)$$

$$V_D^1 = \begin{cases} \max\{A_D^1, -1\}, & \text{if } A_P^1 \geq 0; \\ 0, & \text{if } A_P^1 < 0 \text{ and } A_D^1 \geq -1; \\ -1, & \text{otherwise.} \end{cases} \quad (14)$$

Effort in Trial Court In stage 2 of the game, litigants simultaneously decide how much effort to exert so as to increase their probabilities of winning in trial. The key difference of this step of our game to the one-stage litigation contests analyzed in the previous literature is in what is at stake in the contest. Winning at trial does not settle the question of whether or not damages will be paid, but rather implies the continuation payoffs V_i^ℓ derived in the previous paragraph. Hence, recalling (4) and (5), the plaintiff's and the defendant's objective functions when choosing their effort in trial court are

$$W_P(p_T; d_T) = V_P^0 + \pi_T(p_T, d_T)S_P - p_T - c_T \quad (15)$$

$$W_D(d_T; p_T) = V_D^0 + \pi_T(p_T, d_T)S_D - d_T - c_T. \quad (16)$$

where $S_i := V_i^1 - V_i^0$ denote each litigant i 's difference in continuation payoffs after winning and losing in trial, and $\pi_T(\cdot)$ is the CSF for the trial judgment defined in (1). The Nash-Cournot equilibrium for this contest is obtained by taking the first derivatives of each litigant's objective function with respect to their effort choices, and finding the pair of effort choices for which both of these derivatives are zero. The following proposition presents the equilibrium effort choices in closed form and characterizes aspects of this equilibrium.

Proposition 2 *Let $\kappa := -\frac{S_D}{S_P}$ denote the ratio between the defendant's and the plaintiff's stakes in trial. There exists a unique equilibrium in pure strategies for the effort choices in the trial court given by*

$$p_T^* = \tau Y(1 - Y) \frac{S_P \kappa^\tau}{[Y + (1 - Y)\kappa^\tau]^2} = \frac{d_T^*}{\kappa} \quad (17)$$

and in which the plaintiff wins with probability

$$\pi_T^* = \frac{Y}{Y + \kappa^\tau(1 - Y)}. \quad (18)$$

Equilibrium payoffs generated in this subgame are

$$\widehat{W}_P = V_P^0 + \frac{Y[Y + (1 - \tau)(1 - Y)\kappa^\tau]}{[Y + (1 - Y)\kappa^\tau]^2} S_P - c_T \quad (19)$$

$$\widehat{W}_D = V_D^0 + \frac{Y[Y + (1 + \tau)(1 - Y)\kappa^\tau]}{[Y + (1 - Y)\kappa^\tau]^2} S_D - c_T. \quad (20)$$

Proof. Recall that plaintiff and defendant seek to

$$\max_{p_T} V_P = V_P^0 + \pi_T S_P - p_T \quad (21)$$

$$\max_{d_T} V_D = V_D^0 + \pi_T S_D - d_T, \quad (22)$$

where $S_i = V_i^1 - V_i^0$. The first-order conditions are

$$S_P \frac{\tau Y(1 - Y)p_T^{\tau-1} d_T^\tau}{[p_T^\tau Y + d_T^\tau(1 - Y)]^2} = 1 \quad (23)$$

$$S_D \frac{\tau Y(1 - Y)p_T^\tau d_T^{\tau-1}}{[p_T^\tau Y + d_T^\tau(1 - Y)]^2} = 1. \quad (24)$$

Solving this system of equation yields the equilibrium efforts (17), and substituting for the equilibrium efforts in the CSF and the payoff functions yields the remaining results.

■

Decision of Filing Suit In the first step of the game, the plaintiff decides whether to file suit. If she does, the defendant may defend himself and, if so, the plaintiff has an opportunity to withdraw the case if she wishes so. Strategically, these decisions are similar to the appeals decision analyzed above in Step 3 of the game for the case in which the plaintiff has lost in trial: In both situations, the plaintiff won't receive anything unless she files suit (appeal), but will get full damages with certainty if she files suit (appeals) and the defendant does not defend himself. Hence, depending on the equilibrium payoffs in the trial contest given by (19) and (20), the case will go to trial court if and only if $V_P \geq 0$ and $V_D \geq -1$, the plaintiff files suit without the defendant defending himself if $V_P \geq 0$ and $V_D < -1$, and the plaintiff won't file suit otherwise. The expected equilibrium payoffs before the game starts are, therefore,

$$W_P = \begin{cases} \max\{\widehat{W}_P, 0\}, & \text{if } V_D \geq -1; \\ 1, & \text{if } V_D < -1 \text{ and } V_P \geq 0; \\ 0, & \text{otherwise.} \end{cases} \quad (25)$$

$$W_D = \begin{cases} \max\{\widehat{W}_D, -1\}, & \text{if } V_P \geq 0; \\ 0, & \text{otherwise.} \end{cases} \quad (26)$$

Relevant Parameter Ranges In the preceding analysis, we have presented the ex-ante expected equilibrium payoffs (25) and (26) in terms of the trial stage's expected equilibrium payoffs (19) and (20), which, in turn, depend on the expected equilibrium continuation payoffs (11) – (14), which depend on the expected payoffs in the appeals stage (9) and (10). None of these payoffs are presented in terms of the parameter values. Hence, this paragraph is concerned with relating the equilibrium of the entire game to parameter ranges. Let us first state the expected payoffs in the appeals stage (9) and (10) in terms of the basic model parameters:

$$A_P^0 = (1 - \lambda)Y[1 - \alpha(1 - (1 - \lambda)Y)] - c_A \quad (27)$$

$$A_D^0 + 1 = [1 - (1 - \lambda)Y][1 - \alpha(1 - \lambda)Y] - c_A \quad (28)$$

$$A_P^1 = [1 - (1 - \lambda)(1 - Y)][1 - \alpha(1 - \lambda)(1 - Y)] - c_A \quad (29)$$

$$A_D^1 + 1 = (1 - \lambda)(1 - Y)[1 - \alpha(1 - (1 - \lambda)(1 - Y))] - c_A \quad (30)$$

As for this, note that

$$A_D^\ell + 1 = 1 - 2Z(\ell) + A_P^\ell. \quad (31)$$

Using the definition of $Z(\ell)$, the following comparisons of the A_i^ℓ , $i = p, d$ can be established:

Lemma 1 (a) If $0 \leq Y < \frac{1-2\lambda}{2-2\lambda}$, then $A_P^0 < A_P^1 < A_D^1 + 1 < A_D^0 + 1$.

(b) If $\frac{1-2\lambda}{2-2\lambda} \leq Y < \frac{1}{2}$, then $A_P^0 < A_D^1 + 1 \leq A_P^1 < A_D^0 + 1$.

(c) If $\frac{1}{2} \leq Y < \frac{1}{2-2\lambda}$, then $A_D^1 + 1 \leq A_P^0 < A_D^0 + 1 \leq A_P^1$.

(d) If $\frac{1}{2-2\lambda} \leq Y < 1$, then $A_D^1 + 1 < A_D^0 + 1 \leq A_P^0 < A_P^1$.

Proof. Note first that $A_P^0 < A_P^1$ and $A_D^1 < A_D^0$. Using (31), $A_D^1 + 1 - A_P^1 = 1 - 2Z(1) = 1 - 2\lambda - (2 - 2\lambda)Y \leq 0$ if and only if $Y \geq \frac{1-2\lambda}{2-2\lambda}$. Furthermore, $A_D^0 + 1 - A_P^0 = 1 - 2Z(0) = 1 - (2 - 2\lambda)Y \leq 0$ if and only if $Y \geq \frac{1}{2-2\lambda}$. $A_D^1 + 1 - A_P^0 = (1 - \lambda)(1 - 2Y)(1 - \lambda\alpha) \leq 0$ if and only if $Y \geq \frac{1}{2}$. Last, $A_D^0 + 1 - A_P^1 = (1 - \lambda)(1 - 2Y)(1 + \lambda\alpha) \leq 0$ if and only if $Y \geq \frac{1}{2}$. ■

Next, we use Lemma 1 to fully describe possible equilibria:

Proposition 3 (i) If $0 \leq \max\{A_P^0, A_D^1 + 1\}$, then a case in trial will go to the appeals court with certainty. Furthermore, $V_i^\ell = A_i^\ell$ and $S_i = A_i^1 - A_i^0$. Contest stakes are asymmetric at the trial stage when $Y \neq 1/2$ where

$$\kappa = \frac{1 + \alpha(1 - \lambda)(1 - 2Y)}{1 - \alpha(1 - \lambda)(1 - 2Y)}.$$

(ii) If $A_P^0 < 0 \leq \min\{A_P^1, A_D^1 + 1\}$, then a case in trial will go to the appeals court if and only if the plaintiff wins in trial. If the defendant wins in trial, then the plaintiff will not file appeal. Furthermore, $V_i^0 = 0$, $V_i^1 = A_i^1$, and $S_i = A_i^1$. This case can arise only if $Y < \frac{1}{2}$. Contest stakes are asymmetric at the trial stage where

$$\kappa = \frac{1 + \alpha(1 - \lambda)(1 - 2Y) + c_A}{1 - \alpha(1 - \lambda)(1 - 2Y) - c_A} > 1.$$

(iii) If $A_D^1 + 1 < 0 \leq \min\{A_P^0, A_D^0 + 1\}$, then a case in trial will go to the appeals court if and only if the defendant wins in trial. If the plaintiff wins in trial, then the defendant will not file appeal. Furthermore, $V_i^0 = A_i^0$, $V_P^1 = 1 = -V_D^1$, $S_P = 1 - A_P^0$, and $S_D = -1 - A_D^0$. This case can arise only if $Y > \frac{1}{2}$. Contest stakes are asymmetric at the trial stage where

$$\kappa = \frac{1 + \alpha(1 - \lambda)(1 - 2Y) - c_A}{1 - \alpha(1 - \lambda)(1 - 2Y) + c_A} < 1.$$

(iv) If $A_P^1 < 0 \leq A_D^1 + 1$ or $A_D^0 + 1 < 0 \leq A_P^0$, a case in trial will never go to the appeals court. If the first (second) condition holds, the plaintiff (defendant) does not file appeal after losing in trial and does not take the case further even after winning in trial, in which case appeal is filed by the losing litigant. If the first (second) condition holds, then $V_i^\ell = 0$ ($V_P^\ell = 1 = -V_D^\ell$). For both conditions, $S_i = 0$. The first (second) condition can only be satisfied if $Y < \frac{1-2\lambda}{2-2\lambda}$ ($Y \geq \frac{1}{2-2\lambda}$). Such disputes do not reach the trial stage.

(v) If $\max\{A_P^0, A_D^1 + 1\} < 0$, appeal will not be filed, so that the trial judgment is upheld. Hence, $V_i^0 = 0$, $V_P^1 = 1 = -V_D^1$, and $S_P = 1 = -S_D$. The equilibrium is equivalent to that from one-stage litigation with force parameter τ and court fees c_T .

Proposition 3 distinguishes five scenarios where the case may reach the appeals stage only in scenarios (i)-(iii). Despite the fact that litigants struggle over a damages payment of common value, contest stakes at the trial stage are asymmetric. Litigation that falls in scenario (iv) is not even filed at the court of first instance whereas cases from scenario (v) will never proceed to the second stage of the two-stage litigation.

Note that all the A_i^ℓ that define the scenarios discussed in Proposition 3 are the payoffs from the expected appeals court judgment net of effort costs and the fixed appeals court fees c_A . Hence, these scenarios can be interpreted in terms of these court fees. When appeals court fees are “prohibitively” high, we obtain scenario (v) in which neither litigant would ever file appeal and the trial judgment is always upheld. Anticipating this, litigants know that the trial court judgment is final, so that the equilibrium decisions in trial will be the same as in a one-stage litigation contest.

When the costs of an appeal are somewhat lower, scenario (iv) is obtained where one of the litigants would like to file appeal after losing in trial court but the other litigant would avoid going to the appeals court even after winning in trial. Anticipating that he won't even try and defend a trial judgment in his favor, there is no point in going to trial either, even if the trial court fees c_T are negligible. In other terms, the possibility of appeal may deter some plaintiffs from filing cases with merit. We will elaborate on this and other themes in our discussion presented in the next section.

4 Discussion of Results

In this section, we will examine the impact of the possibility of appeal on the equilibrium outcome by comparing certain features of our equilibrium with those of the equilibrium in the standard, one-stage litigation contest discussed, for instance, in Hirshleifer and Osborne (2001).

Justice The normative evaluation of the litigation contest's equilibrium may take into account very different aspects. A criterion used in the bulk of the contest literature is the sum of contest efforts, a topic we will address below. In the context of litigation contests, the relationship between the underlying facts of the case and the trial outcome is an important additional issue. Accordingly, Hirshleifer and Osborne (2001) propose that *justice* obtains in their setup when the plaintiff's winning probability is equal to the level of defendant fault or the merits of the case Y . The benchmark case for our analysis in which there is a litigation contest only at one stage would yield that the plaintiff's winning probability is exactly equal to Y , thereby performing ideally with regards to the *justice* criterion.

In our analysis of the sequence of the trial stage and the appeal stage, we find that cases which reach both types of court feature an equilibrium winning probability for the plaintiff at the appeal stage equal to $Z(\ell)$, depending on the trial judgment ℓ . Of course, the equilibrium probability of each trial judgment, and whether the case is taken to the appeals court in the first place, depends on the scenario from Proposition 3 in which parameters fall. One important scenario for comparison is that in which the case always reaches both the trial and the appeal stage (scenario (i) in Proposition 3) as this is the clear opposite of the standard one-stage litigation. In this scenario, the plaintiff's expected winning probability is

$$\pi^* = E\pi_A^* = E[Z(\ell)] = \pi_T^*Z(1) + (1 - \pi_T^*)Z(0) = (1 - \lambda)Y + \lambda\pi_T^*. \quad (32)$$

Hence, the appeals system's impact on *justice* depends on the plaintiff's probability of

winning in trial court: Justice is retained if $\pi_T^* = Y$, whereas the expected outcome is biased towards the plaintiff (defendant) if $\pi_T^* > Y$ ($\pi_T^* < Y$).

The following proposition builds on Propositions 2 and 3:

Proposition 4 (a) *If $0 \leq \max\{A_P^0, A_D^1 + 1\}$, a plaintiff's ex-ante probability of winning a case of strength Y is $\pi^* > (<) Y$ in equilibrium if and only if $Y > (<) 1/2$.*

(b) *If $A_P^0 < 0 \leq \min\{A_P^1, A_D^1 + 1\}$ (which necessitates $Y < 1/2$), a plaintiff's ex-ante probability of winning a case of strength Y is $\pi^* < Y$ in equilibrium.*

(c) *If $A_D^1 + 1 < 0 \leq \min\{A_P^0, A_D^0 + 1\}$ (which necessitates $Y > 1/2$), a plaintiff's ex-ante probability of winning a case of strength Y is $\pi^* > Y$ in equilibrium.*

(d) *If $\max\{A_P^0, A_D^1 + 1\} < 0$, a plaintiff's ex-ante probability of winning a case of strength Y is $\pi^* = Y$ in equilibrium.*

Proof. Parts (a) and (d) are immediately implied by Propositions 2 and 3 (together with equation (32) for Part (a)). To see part (b), we have that $\pi^* = \pi_T^* Z(1) < Y$ due to $\kappa > 1 > \lambda$ in this scenario. To see part (c), we have $\pi^* = \pi_T^* + (1 - \pi_T^*) Z(0) > \pi_T^* > Y$ due to $\kappa < 1$. ■

Part (a) means that the equilibrium winning probability of the plaintiff regarding litigation that certainly reaches the appeals system is different from the merits of the case and higher (lower) than Y when the plaintiff has the stronger (weaker) case. It is important to note that the bias of the expected appeals judgment identified in part (a) of Proposition 4 is entirely due to litigants' equilibrium choices rather than due to the assumed impact of the trial judgment on the appeals judgment: If litigants' efforts in each level of jurisdiction were symmetric, the plaintiff's expected probability of prevailing would be equal to Y , as is the case in the one-stage model. However, in our model with appeals the favorite has an incentive to make a larger effort in trial, because there is more at stake for her: Proposition 2 implies that the ratio of litigation efforts at the trial stage is $d_T^* = \kappa p_T^*$, where

$$\kappa = \frac{1 + \alpha(1 - \lambda)(1 - 2Y)}{1 - \alpha(1 - \lambda)(1 - 2Y)} \quad (33)$$

when all cases reach the appeal stage (scenario (i) in Proposition 3), which shows that symmetry results only when $Y = 1/2$.

The stakes of the trial stage are equal to the difference between expected payoffs after winning and losing in trial, $S_i = A_i^1 - A_i^0$. They consist of the difference in the expected damages to be paid or received – the absolute value of which would be identical if litigants' trial efforts were symmetric – and the difference in anticipated efforts in appeal. Recall

that equilibrium efforts in appeals court are symmetric and the higher the closer $Z(\ell)$ is to $1/2$. Hence, both litigants' equilibrium efforts in the appeals court tend to be low (high) when the favorite (underdog) won in trial.⁹ However, this difference in anticipated equilibrium efforts at the appeals stage affect S_P and S_D in different directions: For instance, if the plaintiff is the favorite ($Y > 1/2$), anticipating a lower (higher) effort after winning (losing) in the trial court increases S_P and, thereby, the plaintiff's effort incentive in trial. By contrast, anticipating a lower (higher) effort after the plaintiff's winning (losing) the case in trial court decreases the absolute level of S_D and thus defendant effort in trial.

Parts (b) and (c) of Proposition 4 deal with scenarios in which only one of the litigants has incentives to appeal after trial. The fact that only one type of trial judgment is ever appealed already creates an obvious bias in the potentially appealing litigant's favor. Furthermore, this bias makes the potentially appealing litigant invest more aggressively in trial, which adds to the bias in the overall probability of winning the case.

Litigation effort In our setup, the use of resources in litigation is an inefficient attempt at rent-seeking because the plaintiff's winning probability without either litigant spending would be equal to the defendant's fault. Accordingly, procedural changes that lower the total level of litigation effort and do not influence the *justice* attributes would be clearly efficiency enhancing.

In the benchmark scenario, there is only one litigation contest in which contestants fight over where the judgment falls. In our analysis, we consider a sequence of the trial stage and the appeals stage where contestants at the appeals stage similarly fight over where the judgment falls. At the earlier trial stage, litigants compete for the head start granted by the victory at the court of first instance. The following proposition establishes that litigants' joint equilibrium effort in each of these stages is smaller than joint equilibrium effort in the single-stage model. In order to avoid excessive distinctions, we focus on the scenario where the dispute is anticipated to reach the appeals court with certainty, i.e. the appeals system is allowed to have maximum impact. Furthermore, we assume $\tau = \alpha$ in order to be able to compare the models in a meaningful way.

Proposition 5 *Suppose that $0 \leq \max\{A_P^0, A_D^1 + 1\}$ (i.e., scenario (i) of Proposition 3) applies and that $\tau = \alpha$ holds. Both total trial litigation effort and expected total appeal litigation effort are weakly lower than total litigation effort in the one-stage litigation benchmark.*

⁹Following the convention in the contest literature such as Dixit (1987), we call the plaintiff (defendant) the favorite if $Y > 1/2$ ($Y < 1/2$). The reference favorite is to the party who wins in the one-stage contest with simultaneous moves with a probability greater than one half.

Proof. Using Proposition 2, joint equilibrium efforts in the trial stage are

$$\begin{aligned} p_T^* + d_T^* &= \alpha Y(1 - Y) \frac{(S_P - S_D)\kappa^\tau}{[Y + (1 - Y)\kappa^\tau]^2} \\ &= \alpha 2\lambda \pi_T^*(1 - \pi_T^*) \\ &< 2\alpha Y(1 - Y), \end{aligned}$$

where $S_P - S_D = 2\lambda$, $\pi_T^*(1 - \pi_T^*) < Y(1 - Y)$ due to the higher bias as explained in Proposition 4, and $\lambda < 1$.

Expected total appeal effort is

$$\begin{aligned} E[p_A^*(\ell) + d_A^*(\ell)] &= 2\alpha E[Z(\ell)(1 - Z(\ell))] \\ &= 2\alpha [E[Z(\ell)](1 - E[Z(\ell)]) + Cov(Z(\ell), 1 - Z(\ell))] \\ &< 2\alpha E[Z(\ell)](1 - E[Z(\ell)]) \\ &< 2\alpha Y(1 - Y) = p_B^* + d_B^* \end{aligned} \tag{34}$$

where the first inequality follows from $Cov(Z(\ell), 1 - Z(\ell)) < 0$. With respect to the second inequality, it follows from (32) and the definition of π_T^* that $\pi_T^* < Y$ and thus $E[Z(\ell)] < Y$ when $Y < 1/2$ and $\pi_T^* > Y$ and thus $E[Z(\ell)] > Y$ when $Y > 1/2$. ■

In trial, there is less at stake than in the one-stage litigation model, because the outcome in the latter case is that damages are either awarded or not awarded, whereas the plaintiff winning (losing) in trial in the two-stage litigation can still mean that damages will not be paid (be paid) with some probability. Hence, the difference in payoffs after winning and losing in trial are different than that difference in the one-stage litigation model. To see why ex-ante expected joint appeals effort are lower than efforts in the one-stage setup, recall that effort is the lower the farther away the strength of the case is from $1/2$. Since the ex-ante expected strength of the case in the appeals court is, in equilibrium, biased towards values that are farther away from $1/2$ than Y is, the result follows.

Let us now turn to the overall equilibrium efforts including both the trial and the appeals stage. The following proposition establishes that they can be larger or smaller than efforts in the one-stage model, and that they are more likely to be smaller than in the one-stage model if α is larger:

Proposition 6 *Suppose that $0 \leq \max\{A_P^0, A_D^1 + 1\}$ (i.e., scenario (i) of Proposition 3) applies and that $\tau = \alpha$ holds. The difference between total litigants' equilibrium effort in the two-stage litigation and equilibrium effort $2\alpha Y(1 - Y)$ in the one-stage litigation is*

- (a) *positive for $Y = 1/2$ or sufficiently small α ,*

(b) strictly decreasing in α if $Y \neq 1/2$, and

(c) negative for some parameter values and α sufficiently close to 1.

Proof. Total litigants' equilibrium effort in the two-stage litigation is

$$\begin{aligned} & p_T^* + d_T^* + \pi_T^*(p_A^1 + d_A^1) + (1 - \pi_T^*)(p_A^0 + d_A^0) \\ & = 2\alpha[\lambda\pi_T^*(1 - \pi_T^*) + (1 - \lambda)\{Y(1 - Y(1 - \lambda)) + \pi_T^*\lambda(1 - 2Y)\}], \end{aligned} \quad (35)$$

which is larger than joint effort in the one-stage litigation model if and only if the term in solid brackets in (35) is larger than $Y(1 - Y)$.

Part (a): If $Y = 1/2$, we obtain $\pi^* = Y = 1/2$ such that the term in solid brackets in (35) becomes $\lambda Y(1 - Y) + (1 - \lambda)(1 - Y(1 - \lambda))$ which is larger than $Y(1 - Y)$ proving part (a).

Part (b): The derivative of the term in solid brackets in (35) with respect to α may be stated as

$$\lambda \frac{d\pi_T^*}{d\alpha} [(1 - 2\pi_T^*) + (1 - \lambda)(1 - 2Y)].$$

When $Y < 1/2$, we have that $\pi_T^* < Y$ and $d\pi_T^*/d\alpha = -Y(1 - Y)\ln(\kappa)\kappa^\alpha/(Y + (1 - Y)\kappa^\alpha)^2 < 0$ since $\kappa > 1$, implying the negative sign. When $Y > 1/2$, we have that $\pi_T^* > Y$ and $d\pi_T^*/d\alpha > 0$ (since $\kappa > 1$), implying the negative sign.

Part (c): Considering the scenario in which $\alpha = 1$, the difference is negative, for instance, when $\lambda = 1/4$ and either $Y < .21$ or $Y > .78$, $\lambda = 1/2$ and either $Y < .19$ or $Y > .80$, and when $\lambda = 3/4$ and either $Y < .17$ or $Y > .82$. ■

We find that overall litigation effort is unambiguously higher in the sequence of trial and appeals court than in the one-stage litigation benchmark when the merits of the plaintiff's case are about $Y = 1/2$. This is intuitive. However, the reverse is possible for some configurations of (Y, λ) . The difference between the overall effort when appeals are possible to the level when appeals are not possible is decreasing in the force parameter whenever there is a favorite/underdog configuration (i.e., when $Y \neq 1/2$). This is due to the fact that the asymmetries between litigants (which may discourage effort in our setup) become more pronounced for a greater force parameter. For example, considering trial effort, we have the direct effect from a greater level of α which similarly shows in the benchmark case, but additionally there is the influence on $\pi_T^*(1 - \pi_T^*)$ which implies that the greater asymmetry lowers litigants' effort levels.

Access to Justice A concern that is repeatedly raised by the public is that high litigation costs may discourage legitimate cases from being brought, thereby restricting access to justice for some plaintiffs. Since some of the litigation costs are endogenous in our model, it seems natural to discuss the impact of appeals on access to justice within our

model. Basically, there are two reasons why a litigant may be more or less inclined to go to court in a system with appeals than in a single-level system: Changes in equilibrium outcomes such as equilibrium effort levels or equilibrium winning probabilities, and changes in the overall court fees. However, this latter channel makes the comparison between both channels somewhat arbitrary, because it would be very sensitive to assumptions on these court fees under either system.

To avoid this problem, we focus on the first channel by keeping the overall court fees constant, i.e., we compare the incentives to use each level of jurisdiction in our model with those to use a single-stage court which charges the same fees c as the respective court in our model. Let us start with the comparison of the incentives to use the appeals court with those to use a single stage court if $c_A = c$. The following results hold regardless of the size of the trial court fees, as long as litigants want to go to trial court in the first place.

Proposition 7 *Suppose that c_A is equal to the size c of court fees in a one-level judicial system.*

- (a) *The plaintiff's benefit to file appeal after losing in trial are smaller, and her benefit of defending a win in trial after the defendant's appeal are larger than her benefit of filing suit in a single-level judicial system.*
- (b) *The defendant's benefit of using the appeals court is larger than his benefit from defending himself in a single-level judicial system if and only if he has won in trial and $Y \leq \frac{1+\alpha}{\alpha(2-\lambda)}$.*

Proof. Denote by $B_P = Y[1 - \alpha(1 - Y)] - c$ and $B_D + 1 = (1 - Y)[1 - \alpha Y] - c$ the litigants' benefits of using the single-level court system.

Part (a):

$$\begin{aligned} A_P^0 &= (1 - \lambda)Y(1 - \alpha) + \alpha(1 - \lambda)^2Y^2 - c < Y(1 - \alpha) + \alpha Y^2 - c = B_P \\ A_P^1 &= (\lambda(1 - Y) + Y)(1 - \alpha(1 - Y) + \alpha\lambda(1 - Y)) - c \\ &= Y(1 - \alpha(1 - Y)) - c + \alpha\lambda(1 - Y)Y + \lambda(1 - Y)(1 - \alpha(1 - \lambda)(1 - Y)) > B_P. \end{aligned}$$

Part (b):

$$\begin{aligned} A_D^0 + 1 &= 1 - Y + \lambda Y - \alpha Y(1 - Y) - \alpha\lambda Y(Y - 1 + (1 - \lambda)Y) - c \\ &= B_D + 1 + \lambda Y(1 + \alpha(1 - Y(2 - \lambda))) \\ A_D^1 + 1 &= (1 - Y)(1 - \alpha Y) - c - \alpha\lambda(1 - \lambda)(1 - Y)^2 - \lambda(1 - Y)(1 - \alpha Y) < B_D + 1. \end{aligned}$$

The first of the above equations implies that $A_D^0 + 1 \geq B_D + 1$ if and only if $Y \leq \frac{1+\alpha}{\alpha(2-\lambda)}$.

■

Proposition 7 is interesting for two reasons: First, it reveals another asymmetry in the litigants' incentives: While winning in trial unambiguously increases the plaintiff's incentives to use the appeals court compared to a single-level court, the defendant's incentives do so only if his fault Y is sufficiently small. To see the intuition for this, note that the plaintiff's benefit of going to a single court, $Y[1 - \alpha(1 - Y)] - c$, is strictly increasing in the strength of her case Y . However, the defendant's benefit of going to a single court, $(1 - Y)[1 - \alpha Y] - c$, has a unique minimum at $Y = \frac{1 + \alpha}{2\alpha}$. This difference is due to the fact that both litigants' equilibrium effort costs are identical, but the impact of Y on the equilibrium winning probabilities works in opposite directions for both litigants. Hence, the defendant's benefit of going to court may be increasing in his fault if it is already very high. Since the defendant's win in trial reduces the strength of the plaintiff's case in the appeals court, this may actually reduce the defendant's benefit of going to the appeals court compared to a single-level court.

Second, Proposition 7 can be used along with Proposition 3 in order to compare equilibrium incentives to file suit under the two-levels and the single-level judicial system. For instance, if the plaintiff has a very strong case $\left(Y > \max\left\{\frac{1}{2(1-\lambda)}, \frac{1+\alpha}{\alpha(2-\lambda)}\right\}\right)$, there exist levels of court fees such that the defendant may still want to defend himself in a single-level system whereas he would never go to the appeals court with two levels of jurisdiction, which implies that he wouldn't defend himself in trial either even if trial court fees are very low but positive.

The opposite scenario would be a court system in which the court fees charged at trial level are equal to those in a one-level system, and the appeals court is free. This absence of appeals court fees immediately implies that the parameters are in scenario (i) of Proposition 3. Clearly, the bias identified in Proposition 4 makes the two-level system, *ceteris paribus*, more (less) attractive for the favorite (underdog) as compared to a single-level system. Furthermore, the following proposition shows that, in absence of this bias (i.e., if $Y = 1/2$), the possibility of appeals reduces both litigants' incentives to go to trial court:

Proposition 8 *Suppose that $c_T = c$, where c is the court fee in a single-level court system, and $c_A = 0$.*

- (a) *If $Y = 1/2$, the plaintiff (defendant) has lower incentives to file suit (higher incentives to defend himself) than in a single-level court system.*
- (b) *If α is sufficiently close to one and Y sufficiently close to one (zero), the plaintiff (defendant) may have higher incentives to file suit (to defend himself) than in a single-level court system. This may even be the case if total equilibrium effort is higher than in the single-level court system.*

Proof. Part (a): Recall $B_P = Y[1 - \alpha(1 - Y)] - c$ and $B_D + 1 = (1 - Y)[1 - \alpha Y] - c$. Hence, if $Y = 1/2$, then $B_P = B_D + 1 = \frac{1}{2} - \frac{\alpha}{4}$. Furthermore, $\pi_F^* = 1/2$, $S_P = -S_D = \lambda$ and $V_i^0 = A_i^0$. Hence, (19) and (20) imply that

$$V_P = A_P^0 + \pi_F^* \lambda (\pi_F^* + (1 - \alpha)(1 - \pi_F^*)) - c = \frac{1}{2} - \frac{\alpha}{4} - \frac{\alpha \lambda (1 - \lambda)}{4} \quad (36)$$

$$V_D + 1 = A_D^0 + 1 - \pi_F^* \lambda (\pi_F^* + (1 + \alpha)(1 - \pi_F^*)) - c = \frac{1}{2} - \frac{\alpha}{4} - \frac{\alpha \lambda (1 - \lambda)}{4}. \quad (37)$$

Part (b): The possibility of these scenarios may be established relating to the example used in the proof to Proposition 6. Be reminded that the total efforts are lower, considering the scenario in which $\alpha = 1$, when $\lambda = 1/4$ and either $Y < .21$ or $Y > .78$, $\lambda = 1/2$ and either $Y < .19$ or $Y > .80$, and when $\lambda = 3/4$ and either $Y < .17$ or $Y > .82$. For these scenarios, we find that the plaintiff has greater incentives in the two-stage litigation to file the case when $\lambda = 1/4$ and $Y > .7$, $\lambda = 1/2$ and $Y > .72$, and when $\lambda = 3/4$ and $Y > .73$. Intuitively, there are some levels of Y that command higher total effort but still induce greater filing incentives. This stems from the biased winning probability. Similarly, the defendant has greater incentives to proceed to trial in the two-stage litigation when $\lambda = 1/4$ and $Y < .3$, $\lambda = 1/2$ and $Y < .28$, and when $\lambda = 3/4$ and $Y < .27$. ■

Intuitively, the overall stakes of the two-level system is the same, but, as established in Proposition 6, aggregate equilibrium efforts are larger than in the single-level system if $Y = 1/2$. Hence, the net benefit from using the two-level system is smaller than that of the single-level system.

Part (b) of Proposition 8 confirms the intuition that one litigant's benefit of going to court may be higher than in the single-level case if the bias introduced by the appeals system is sufficiently strong, that is, if Y is sufficiently far away from $1/2$. However, there are two opposing effects of a strong bias, lower total equilibrium efforts and higher equilibrium probability for the favorite. Hence, it is possible that the benefit from filing (defending) the case in trial court is greater even though litigation is more costly in terms of total effort.

5 Conclusion

Many legal systems allow dissatisfied parties to appeal to higher decision-making authorities, whereas some forms of dispute resolution explicitly exclude this right. We have analyzed the impact of the possibility to appeal a judgment on rent-seeking incentives, winning probabilities, and the incentives to go to court. Anticipating the possibility of appeal induces the litigant who has the stronger case to invest more litigation effort than the opposing litigant, thereby improving her overall winning probability beyond the level

that would be commensurate with the strength of her case. Comparing this with well-established results from the literature, we conclude that the appeals system introduces a bias in judicial decision-making. On the positive side, however, we have shown that the appeals system may reduce total rent seeking expenditures and improve access to justice if the facts of the case are particularly clear (i.e., the plaintiff has a very strong or very weak case) and the courts' decision making reacts strongly to litigation efforts.

Despite the immense practical importance of appeals systems, the literature is relatively scant. The present paper makes an attempt to shed some light on the mechanisms at play by referring to the litigation contest setup. However, it needs to be stressed that, while standard in the literature on litigation effort, the Tullock (1980) contest model is an extremely stylized representation of how courts decide. However, the model has proven quite rich in the existing literature on litigation contests and has yielded many plausible insights. A further qualification is that we have, for the sake of simplicity, disregarded important issues such as litigants' potentially imperfect or incomplete information on details of the case, settlement, delegation to lawyers, and behavioral biases in litigants' decisions. These issues are left for future research.

References

- ACAS (2015): *Discipline and Grievances at Work*. <http://www.acas.org.uk>.
- BAIK, K. H., AND I.-G. KIM (2007a): "Contingent fees versus legal expenses insurance," *International Review of Law and Economics*, 27(3), 351–361.
- (2007b): "Strategic Decisions on Lawyers Compensation in Civil Disputes," *Economic Inquiry*, 45(4), 854–863.
- BASSETT, D. L. (2002): "I Lost at Trial-In the Court of Appeals!: The Expanding Power of the Federal Appellate Courts to Reexamine Facts," *Houston Law Review*, 38, 1129–1194.
- BERNARDO, A. E., E. TALLEY, AND I. WELCH (2000): "A theory of legal presumptions," *Journal of Law, Economics, and Organization*, 16(1), 1–49.
- CEPEJ (2014): *Report on 'European judicial systems - Edition 2014 (2012 data): efficiency and quality of justice'*. <http://www.coe.int>.
- CHEN, K.-P., AND J.-S. WANG (2007): "Fee-shifting rules in litigation with contingency fees," *Journal of Law, Economics, and Organization*, 23(3), 519–546.

- DAUGHETY, A., AND J. REINGANUM (2000): "Appealing Judgments," *RAND Journal of Economics*, 31(3), 502–525.
- DIXIT, A. (1987): "Strategic behavior in contests," *The American Economic Review*, pp. 891–898.
- FARMER, A., AND P. PECORINO (1999): "Legal expenditure as a rent-seeking game," *Public Choice*, 100(3-4), 271–288.
- GERSHKOV, A., AND M. PERRY (2009): "Tournaments with midterm reviews," *Games and Economic Behavior*, 66(1), 162–190.
- HIRSHLEIFER, J., AND E. OSBORNE (2001): "Truth, effort, and the legal battle," *Public Choice*, 108(1-2), 169–195.
- IOSSA, E., AND G. PALUMBO (2007): "Information Provision and Monitoring of the Decision-Maker in the Presence of an Appeal Process," *Journal of Institutional and Theoretical Economics*, 163(4), 657–682.
- KATZ, A. (1988): "Judicial decisionmaking and litigation expenditure," *International Review of Law and Economics*, 8(2), 127–143.
- LEVY, G. (2005): "Careerist Judges and the Appeals Process," *RAND Journal of Economics*, 36(2), 275–297.
- LUPPI, B., AND F. PARISI (2012): "Litigation and legal evolution: does procedure matter?," *Public Choice*, 152(1-2), 181–201.
- MÜNSTER, J. (2009): "Repeated contests with asymmetric information," *Journal of Public Economic Theory*, 11(1), 89–118.
- NALEBUFF, B. (1987): "Credible Pretrial Negotiation," *RAND Journal of Economics*, 18(2), 198–210.
- PARISI, F. (2002): "Rent-seeking through litigation: adversarial and inquisitorial systems compared," *International Review of Law and Economics*, 22(2), 193–216.
- POWELL, R. (2007): "Allocating defensive resources with private information about vulnerability," *American Political Science Review*, 101(04), 799–809.
- SHAVELL, S. (1995): "The Appeals Process as a Means of Error Correction," *Journal of Legal Studies*, 24(2), 379–426.

- (2006): “The Appeals Process and Adjudicator Incentives,” *Journal of Legal Studies*, 35, 1–475.
- (2007): “Optimal Discretion in the Application of Rules,” *American Law and Economics Review*, 9(1), 175–194.
- (2010): “On the Design of the Appeals Process: The Optimal Use of Discretionary Review Versus Direct Appeal,” *Journal of Legal Studies*, 39(1), 63–108.
- SLANTCHEV, B. L. (2010): “Feigning weakness,” *International Organization*, 64(03), 357–388.
- SPITZER, M., AND E. TALLEY (2000): “Judicial Auditing,” *The Journal of Legal Studies*, 29(2), 649–683.
- TULLOCK, G. (1980): “Efficient Rent Seeking,” in *Toward a Theory of the Rent-Seeking Society*, ed. by J. Buchanan, R. Tollison, and G. Tullock, pp. 269–282. Texas A&M University Press.
- WÄRNERYD, K. (2000): “In defense of lawyers: moral hazard as an aid to cooperation,” *Games and Economic Behavior*, 33(1), 145–158.
- WOHLSCHLEGEL, A. (2014): *The Appeals Process and Incentives to Settle*. MPRA Working Paper 59424.
- YILDIRIM, H. (2005): “Contests with multiple rounds,” *Games and Economic Behavior*, 51(1), 213–227.