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Judicial Detection Skill, Litigational Opportunism, and Contractual Compliance

by
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Abstract

Mutually beneficial agreements might fail if the parties fear contractual opportunism. Litigation is supposed to prevent this, but still leaves room for litigational opportunism: Even knowing that the opponent has fulfilled his obligations, a party might bring suit. We show that with positive judicial detection skill, litigation fees can be designed to deter opportunistic suits and simultaneously induce bilateral contractual compliance. With zero detection skill, as implicitly assumed by most of the economic literature on litigation, bilateral contractual compliance cannot be induced. We apply our results to evaluate the American and the British cost allocation rules.

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Keywords: *Procedural law, frivolous suits, positive detection skill, verifiability, litigation costs, American rule, British rule.*

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"...we are not surely bound to keep our word because we have given our word to keep it."
D. HUME, *A Treatise of Human Nature*

1. Introduction

Mutually beneficial agreements are doomed to fail if at least one of the parties fears that the other one is tempted to cheat. Litigation is supposed to prevent this *contractual opportunism*, but gives room for *litigational opportunism*: Even if a party knows that the opponent has fulfilled his obligations, she might still bring suit[1].

This paper investigates the link between litigation and the contractual behavior that might lead to litigation, the *"underlying behavior"*. We show that with positive detection skill, litigation fees can be designed to deter opportunistic suits, without disencouraging legitimate ones, and simultaneously induce bilateral contractual compliance. Positive judicial detection skill is a necessary condition for this motivational effect of litigation fees on the underlying behavior of the parties. With zero detection skill, bilateral contractual compliance cannot be induced.

Judicial detection skill is measured by two parameters[2]: the probability of correctly forming the opinion that a suit is legitimate, and the probability of wrongly forming this opinion, if the suit is actually opportunistic. If the probability of a correct decision is greater than the probability of a wrong one, the judge is said to have positive detection skill[3]. Judges are represented by these two conditional probabilities.

In contrast to this approach, most of the literature on litigation represents judges either as perfect decision-makers[4] or by a unique unconditional probability that the plaintiff prevails[5]. Hence the latter papers make the implicit assumption that judges have zero detection skill. As exceptions, KATZ 1990, POLINSKY/SHAVELL 1989 and POLINSKY/RUBINFELD 1993 should be mentioned[6]. In KATZ' model, the probability that the plaintiff wins a frivolous suit is assumed to be zero, while in case of a legitimate suit, his probability to prevail may be positive. POLINSKY/SHAVELL and POLINSKY/RUBINFELD

[1] The possibility of opportunistic suits is a deviation from the common (and often implicit) assumption in the Principal-Agent-Literature, that "contract execution problems never arise..." (WILLIAMSON 1985, p. 31).

[2] In our paper, the term judge refers to any institution that makes decisions on the merits of a case, e.g. judges, justices, collegial courts or juries.

[3] Using this tool, we refer to the framework of Ronald Heiner's theory of imperfect decision-making. For an introduction into this theory, see HEINER 1983, HEINER 1985, HEINER 1986 and HEINER/SCHMIDTCHEN 1995. We want to point out that in this paper we do not analyze the judge's decision-making process itself. On this see e.g. ANDERSON/SHUGART/TOLLISON 1989, COHEN 1991 or MACEY 1994 with a comment by ALEXANDER 1994.

[4] See e.g. PRIEST/KLEIN 1984.

[5] Among the many see e.g. GOULD 1973, LANDES 1994 and even SHAVELL 1995.

[6] Some others mention two types of judicial errors, see e.g. POSNER 1986 or TULLOCK 1994, without using this insight for a rigourous analysis.

assume that a legitimate plaintiff easier can produce evidence; hence frivolous plaintiffs prevail at trial with a lower probability than legitimate ones.

The impact of litigation on the underlying contractual behavior is the subject of our paper. Most of the literature on litigation disregards this aspect and limits the analysis to the decision between settlement or trial[7]. Also the authors that expressly focus on frivolous suits[8] disregard this impact. Moreover, Priest/Klein 1984, Katz 1990 and Polinsky/Rubinfeld 1993 assume an exogenously fixed quota of frivolous plaintiffs. Such an approach neglects that a potential plaintiff's decision to bring a frivolous suit depends on his incentives rather than on his exogenously given type.

An exception is Polinsky/Shavell 1989, who discuss the impact of legal error on the incentive for potential defendants to obey the law. But they do not analyze the impact on the plaintiff's incentives when he decides on his underlying behavior. Since it is the interaction of the contracting parties that creates a gain from cooperation, the incentive of neither party should be neglected.

This paper is organized as follows:

- Chapter 2 describes the basic contract game without third party enforcement. The inefficiency of this game's equilibrium serves to motivate the introduction of litigation as a second stage in the parties' interaction.
- Chapter 3 analyzes the two stage game. The first stage is the basic contract game, which describes the underlying behavior. In the second stage one party is given the opportunity to sue the other. We describe the theory of judicial detection skill in more detail and relate it to the concept of verifiability, which is known from contract theory. In section 3.5, we derive conditions for bilateral contractual compliance and state a Theorem.
- In chapter 4 we use this Theorem to analyze how the American and the British rules to allocate litigation costs can guarantee bilateral contractual compliance.
- Chapter 5 summarizes the analysis and makes suggestions for further research.

2. Contracts without third party enforcement

In this paper, a contract means an agreement between the players Charlie and Lucy as follows: Charlie promises to pay Y in advance to Lucy. She promises to make an investment X in return, which produces a gross monetary benefit of $Z = Z(X)$ to Charlie, if carried out. We assume that the parties are risk neutral payoff maximizers

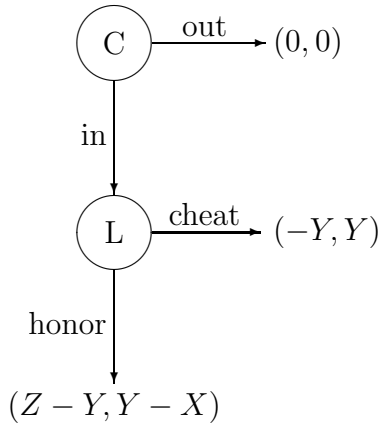
[7] See Posner 1986, chapter 21.5, Cooter/Rubinfeld 1989, and the literature on the "selection hypothesis": Priest/Klein 1984, Wittman 1985, Priest 1985, Stanley/Coursley 1990, and Thomas 1995.

[8] E.g. Rosenberg/Shavell 1985, Bebchuk 1988, and Miceli 1993.

and that $Z > Y > X > 0$. Hence the parties would mutually benefit if both of the promises were fulfilled. But this condition is not sufficient to guarantee that the parties will later actually act as agreed: The contract is not self-enforcing[9].

The agreement leads to a one-shot game we denote as Γ. **Figure 1** represents the extensive form of Γ, where Charlie's payoff is the first entry in the brackets, Lucy's payoff is the second[10].

Figure 1: Basic contract game Γ in extensive form



Lucy is tempted to cheat instead of honor the contract. We call this behavior of Lucy *"contractual opportunism"*. The unique subgame perfect equilibrium of this game is the strategy combination $\{out; cheat\}$. This equilibrium is pareto-suboptimal: Both parties were better off by playing the path "in, honor". It is the anticipation of Lucy's contractual opportunism that makes Charlie choose "out". Hence both parties would agree to employ a device that makes "in" more attractive for C, as long as the gain from cooperation $(Z - X)$ is larger than the costs of this device. Giving Charlie the option to sue Lucy for her investment X may serve as such a device, but this opens up another source of opportunistic behavior: Charlie could be tempted to bring suit even if Lucy has fulfilled her contractual obligation. We call this *"litigational opportunism"*.

3. Contracts with litigation

3.1 The game form

If a party brings suit in order to make the other party honor the contract, and the judge comes to the opinion that the sueing party has not fulfilled her own contractual

[9] In the diction of Telser 1980.

[10] This game is usually called a "trust game" - see Kreps 1990, Coleman 1990, Güth/Kliemt 1993, and Schmidtchen 1993 - even though "distrust game" would be the more appropriate term.

obligation, then we assume that the case will be lost. Hence a party whose choice of action is perfectly verifiable by the judge should go to court only if her own investment actually has been made. Perfect verifiability means that the contracting parties expect an enforcer to discover without error whether an action was actually carried out or not[11]. An example of a perfectly verifiable input is payment - in general, payments will be made via a bank or in exchange for a receipt, so the party who actually has made a payment will often have no difficulty to convince an enforcer. With respect to the verifiability of inputs, we distinguish three cases: both of the parties' investments, only one, or neither of them is perfectly verifiable. The first of these cases is trivial: A judge would perfectly know what the parties actually have played and could simply "correct" the parties' actual choices if they were made in violation of the contractual agreement.

We refer to the second of the three casesand exclude from our analysis that Lucy might bring suit as well[12]. We assume that Charlie's investment is perfectly verifiable by third parties, but not Lucy's[13]. Thus our model starts with a contract stage as described by the game Γ, which models what we call the underlying behavior. Then we introduce that Charlie, having chosen "in" and observed Lucy's reaction, has the option to sue Lucy in order to make her honor the contract (i.e. invest X as they had agreed upon). Hence we limit our view to the case that Charlie sues for the fulfillment of the contract and not for receiving back his advance payment[14]. X is the value of the case or the value at stake, if litigation takes place. The extensive form of this game with litigation is shown in **Figure 2**, where Charlie's decision nodes are labelled as C_1, C_2 and C_3. Lucy's node is labelled as L.

We denote this game form, which is common knowledge, as $\hat{\Gamma}$. The payoffs (and therefore the parties‘ preferences over the outcomes) in $\hat{\Gamma}$ do not only depend on the contract parameters (X, Y, Z), but also on the effects litigation has on the players' payoffs. With the upper case Δ_t^s we denote the effect on Charlie's payoff, the lower case δ_t^s to Lucy's, if Charlie brings suit of status s, given the cost allocation rule t. These effects on the parties' payoffs depend on

- the amount of the litigation fees
- the litigation cost allocation rule
- the probability that the plaintiff prevails
- the value of the case[15]

[11] See Laffont/Tirole 1993, p. 3 on non-verifiable inputs.

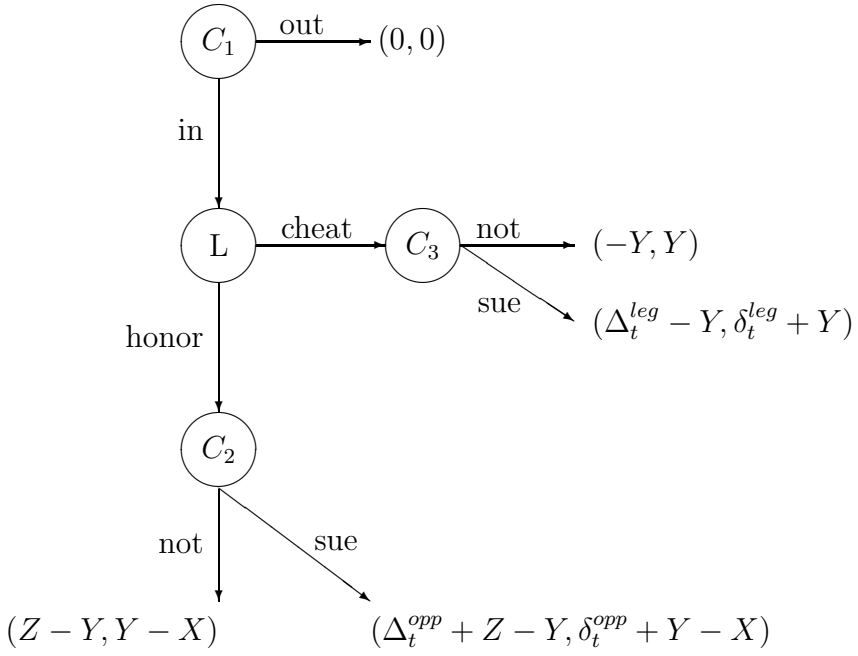
[12] The third case - both of the inputs are imperfectly verifiable - we will analyze in a sequel paper.

[13] For the basic idea of our analysis it is not crucial that the verifiable input is made first.

[14] If the factor market for Lucy's contribution is in equilbrium, Charlie could could let someone else produce Z, if Lucy is to deliver X. Charlie could also sue Lucy to make her pay him Z, which costs her not more than X, since she is able to produce Z from X.

[15] If settlement is taken into account, the result of the bargaining would also influence the effects on the parties' payoffs. The same holds for the Rule 11, analyzed in Polinsky/Rubinfeld 1993.

Figure 2: Litigation game form



The status of litigation s is either *opportunistic* or *legitimate*: To bring suit at C_3 - after the path "in, cheat" - we call legitimate ($s = leg$); to sue at C_2 we call opportunistic ($s = opp$). With q^s we denote the probability that Charlie prevails, given the case is of status s[16].

3.2 Litigation fees and cost allocation rules

The parameter t stands for the cost allocation rule the judge has to obey. We analyze two idealized types of cost allocation rules: Under the *American rule* ($t = a$), both of the parties have to bear the own costs. The *British* or *European* rule ($t = b$) imposes the winner's costs upon the loser. Other cost allocation rules are possible[17].

[16] As we discussed above, we disregard that Charlie might bring suit after "out". To put the reason for this more formally: The probability that Charlie prevails is zero, if he sues without having made his perfectly verifiable investment Y.

[17] E.g. in US civil courts, litigation costs may be shifted to the loser, if the case is "filed in bad faith", see Adams 1995, p. 74. However, whether a suit is opportunistic or was brought "in bad faith" is far from being obvious and subject to judicial decision-making. Adams also discusses that the different roles of judges and parties may be the reason why different cost allocation regimes exist - a question we exclude from consideration in this paper. Bebchuk/Chang 1993, p. 7, mention two more basic rules, the Pro-Plaintiff- and the Pro-Defendant-Rule, and analyze cost allocation with reference to the "margin of victory".

Litigation costs consist of two parts: First, the opportunity costs of resources the parties voluntarily spend to influence the expected outcome of the suit by altering the probability q^s. Second they contain the fee the court imposes[18]. In this paper we assume that the parties' investments, e.g. the hiring of lawyers, have no impact on q^s. Therefore the optimal decision is not to make expenses voluntarily, and the parties' litigation costs contain nothing but non-negative fees they have to pay before the judicial decision. Let $P \geq 0$ denote the plaintiff's and $D \geq 0$ the defendant's ex-ante payment.

It depends on the cost allocation rule what the parties have to bear after the judgement has been made. They have to take into account this ex-post burden when making their strategy choice in $\hat{\Gamma}$. We denote Charlie's expected burden as $p_t = p_t(D, P, q^s)$ and Lucy's as d_t. p_t consists of what Charlie has to pay if he looses multiplied by the probability of losing $(1-q^s)$, plus what he has to pay in case he wins (multiplied by the probability q^s). The parties' expected ex-post burdens for the American and the British cost allocation rules are shown in **figure 3**.

Figure 3: Expected ex-post litigation cost burden

t	a	b
to L	$q^s D + (1-q^s)D = D$	$q^s(P+D) + (1-q^s)0$
to C	P	$(1-q^s)(P+D)$

Both of these two rules imply that the expected burden to the plaintiff p_t is non-increasing if his probability to prevail q^s increases. We limit our analysis to cost allocation rules that have this property.

3.3 Judicial detection skill

Even under the assumption that the parties do not disagree about the value of X, third parties - e.g. courts - are in general unable to observe whether this investment actually has been made by Lucy, if suit is being brought. Therefore it makes sense to assume that potential litigants do not expect the judge, who decides on non-verifiable inputs, to be free of errors. We assume judges to be benevolent, i.e. they try to make correct

[18] A fee could also be negative, if the law enforcement system would allow for paying subsidies. In our model, this possibility can be neglected.

decisions[19].

There is a variety of reasons for judicial errors. POSNER 1990 distinguishes "Questions of Fact" (p. 203) and "Questions of Law" (p. 197). We only focus on errors concerning the true facts of the case, but not how to interpret legal rules or which rule is to be applied. Judicial competence seems to be a further important factor, lack of information another[20].

We define $r := q^{leg}$ and $w := q^{opp}$. Hence r is the conditional probability that a judge decides in favor of the palintiff, given the suit is actually legitimate, and w is the probability of making this decision, given the suit is opportunistic. An overview of these conditional probabilities is given in **figure 4**.

Figure 4: Two types of judicial error

Suit is / Judge's decision	legitimate	opportunistic
in favor of C	r	w
in favor of L	$1-r$	$1-w$

The basic idea of the (r, w) approach is adapted from HEINER 1983, 1985[21]. There is a large literature in experimental psychology concerned with the imperfect detection of signals[22]. In such experiments a person must decide repeatedly whether a signal is present or not. The judge is in a very similar situation, when he repeatedly has to decide whether suits are opportunistic or not. HEINER 1986 was the first who applied basic insights of signal detection theory to a law and economics problem, when giving an economic rationale for the "stare decisis" doctrine.

Concerning the parameters $r, w \in [0, 1]$ we distinguish four cases:

- If $(r - w) = 1$, the parties expect the judge to decide in favor of the plaintiff only if

[19] SANCHIRICO 1995 explicitly models the utility function of judges with respect to this. MICELI/COŞGEL 1994 and RASMUSEN 1994 tried to explain such behavior as rational. Deviations from this might be caused by prejudices (see SCHRAG/SCOTCHMER 1994), but ASHENFELTER/EISENBERG/SCHWAB 1995 came to the conclusion that the judges' background does not play a significant role in decision-making.

[20] Which is to be distinguished from parties' imperfect information, which was anlyzed by BEBCHUCK 1984.

[21] HEINER/SCHMIDTCHEN 1995 applies this concept on game theory. See also FRANK 1988.

[22] An introduction to signal detection theory is provided by SWETS 1988.

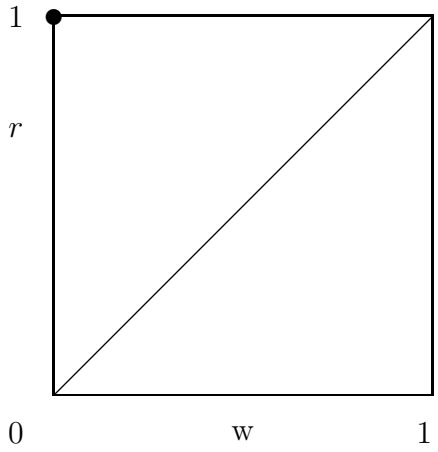
the case actually is legitimate. In case of opportunistic litigation, they expect the judge to always decide in favor of the defendant. Hence they perceive the judge to have *"perfect detection skill"*. In **figure 5**, this case is represented by the bold dot in the upper left corner.

- With $(r - w) = 0$, the parties expect the judge to decide no better than by pure chance. The perceived probability of a decision in favor of the plaintiff does not depend on whether the case is legitimate or opportunistic. This describes the perception of *"zero detection skill"*. In **figure 5**, all of the (r, w) combinations on the diagonal line represent this case.

- $(r - w) < 0$ means negative detection skill[23]. The lower right triangle in **figure 5** represents this case.

- In case of $(r - w) \in]0, 1[$, the judge is perceived as having "positive detection skill". The parties expect the judge to be able to distinguish between legitimate and opportunistic cases better than by pure chance, but not being free of errors. The upper left triangle in **figure 5**, except for the $r = w$-line and the bold dot, stands for this case.

Figure 5: Graphical representation of judicial detection skill



The theory of detection skills provides an operationalization for the concept of input verifiability. Perfect detection skill corresponds to the description that this fact is perfectly verifiable, such as Charlies choice in the contract stage. Zero detection skill corresponds to the complete non-verifiability of the relevant fact. The case of $(r - w) \in]0, 1[$ stands for imperfect, but positive verifiability, which applies to Lucy's choice of action in the contract stage. Note that detection skill describes the competence of the third-party

[23] If a judge is aware of being of this type, he could improve his performance by consequently sentencing against the opinion he has actually formed.

enforcer, while the verifiability rather describes the difficulty of the decision problem under consideration[24].

The observation that judges acquire many years of training and experience in their profession may induce potential litigants to perceive that judges have positive detection skill. Hence, it should not be excluded by assumption that litigating parties expect positive judicial detection skill. In this paper, we allow for positive detection skill and assume $r \geq w$. Furthermore, we assume that the parties have access to the same information regarding the judicial system, and form rational expectations. Thus the parties' perceptions are equal when they choose their strategies in the litigation game form. The assumption of positive detection skill, compared to models that are limited to zero detection skill, provides further insights: We derive results that require positive detection skill as a necessary condition.

3.4 Conditions for bilateral contractual compliance

The aim of the subsequent analysis is to derive conditions under which *bilateral contractual compliance* occurs. By this we mean that "in, honor, not" is the unique subgame perfect equilibrium path in $\hat{\Gamma}$. In this equilibrium, both of the parties fulfill their contractual obligations and Charlie does not bring suit. This path provides the maximum common payoff to the parties: The gain from cooperation, $Z - X$, is being created and the parties do not have to spend litigation fees $P + D$. To reach this result, both types of opportunism - litigational and contractual - must be prevented.

First we define the following expressions, given the cost allocation rule t:

- The Selection Condition[25]: $\Delta_t^{opp} < 0 < \Delta_t^{leg}$
- The Compliance Condition: $\delta_t^{leg} < -X \wedge \Delta_t^{opp} < 0 < \Delta_t^{leg}$

Hereafter we denote, for a given cost allocation rule t, the Selection Condition as SC_t and the Compliance Condition as CC_t. We show the subgame perfectness by backward induction, which requires three steps.

1) We first consider Charlie's terminal nodes: If SC_t holds, then at C_2, Charlie is deterred from opportunistic suits. At C_3, where bringing suit is legitimate, he would bring suit. Hence given SC_t, Charlie brings suit if, and only if, it is legitimate.

2) At Lucy's node: Given SC_t, Lucy's option "honor" is followed by "not", which brings her $(Y - X)$ as payoff. Her option "cheat" would be followed by Charlie's action "sue", and therefore yields $\delta_t^{leg} + Y$. If CC_t holds, then Lucy's payoff from "cheat" is smaller

[24] Heiner 1983 coined the term *Competence-Difficulty-Gap* or *C-D-Gap* to describe a divergence between the complexity of a decision problem and the detection skills of an imperfect decision-maker.

[25] The term "selection" must not be confused with the one used in the literature on the selection hypothesis; see Priest/Klein 1984.

than the one from "honor". Hence, Charlie can expect her to choose "honor" if CC_t holds.

3) Given CC_t, Charlie at his first node can expect that Lucy will answer "honor" on "in", in which case Charlie will react with "not". This path brings him $(Z - Y)$, which is greater than zero, the payoff from "out". So it is better for him to choose "in".

Hence CC_t is sufficient for bilateral contractual compliance. In addition to this, CC_t is also necessary for bilateral contractual compliance as well, as we state formally in the following Lemma:

Lemma 1: In $\hat{\Gamma}$, bilateral contractual compliance is equivalent to CC_t.

Proof: For convenience, in this proof we represent the term "bilateral contractual compliance" by the acronym bcc. The proof of $CC_t \Rightarrow$ bcc has already been provided by the backward induction above.

Thus $CC_t \Leftarrow$ bcc is to be shown. This is equivalent to $\neg CC_t \Rightarrow \neg$bcc, which is equivalent to $\delta_t^{opp} \geq -X \Rightarrow \neg$bcc $\wedge \neg SC_t \Rightarrow \neg$bcc.

$\delta_t^{opp} \geq -X \Rightarrow \neg$bcc holds, since choosing "honor" would not be the unique equilibrium action for Lucy (either "cheat" is superior for her or there is a tie, hence no unique equilibrium).

$(\neg SC_t \Rightarrow \neg$bcc) holds as well: $\neg SC_t$ is equivalent to $\Delta_t^{opp} \geq 0 \vee \Delta_t^{leg} \leq 0$.

$\Delta_t^{leg} \leq 0$ implies that, at the node C_3, "sue" would not be the unique equlibrium action. But if Lucy expected Charlie to play "not" at C_3, the action "cheat" would be more attractive to her than "honor".

$\Delta_t^{opp} \geq 0$ implies that, at C_2, "not" would not be the unique equilibrium action. Either of these cases implies ¬bcc: Q.E.D.

If a setting of the parameters (r, w, P, D, t) is such that CC_t holds, then it provides an endogenous incentive for the parties to comply with the contract. Both types of opportunism are then prevented, the contractual as well as the litigational opportunism.

The Lemma enables one to determine for any setting of the law enforcement system parameters whether bilateral contractual compliance occurs or not. Hence we can use this tool to search for answers on three different types of questions:

- Given (r, w, t): what combinations of (P, D) should a legislator fix to guarantee bilateral contractual compliance (see section 4.3 below)?
- Given (P, D, t): what (r, w) is required for bilateral contractual compliance (See section 4.4 below)?
- Given (r, w, t): should P and D depend on X or be independent[26]?

[26]We analyzed this problem with reference to the British rule in Schmidtchen/Kirstein 1996.

3.5 Implications for judicial detection skill

In chapter 3.1 we mentioned that we limit our analysis to cost allocation rules that impose on the plaintiff an expected burden, $p_t(D, P, q^s)$, which is non-increasing in q^s. Stated formally, this means:

$$\forall t \in \{a; b\} : \frac{\partial p_t}{\partial q^s} \leq 0$$

If an allocation rule meets this condition, this implies a further important property: The condition that keeps a potential plaintiff from opportunistic suits, but not from legitimate ones, denoted SC_t, only holds if judges have positive detection skill. This is stated formally in our next Lemma.

> **Lemma 2:** In $\hat{\Gamma}$, given a cost allocation rule t such that $\forall s \in \{leg; opp\}$: $\frac{\partial p_t}{\partial q^s} \leq 0$, then $SC_t \Rightarrow r > w$.
>
> **Proof:** In case of litigation, Charlie receives his claim X with probability q^s and has to expect a litigation cost ex-post burden p_t. Hence the expected effect on Charlie's payoff is: $\Delta_t^s = q^s X - p_t(D, P, q^s)$.
>
> From $\partial p_t / \partial q^s \leq 0$ and $X > 0$ it follows $\partial \Delta_t^s / \partial q^s > 0$. Hence $\Delta_t^{opp} < \Delta_t^{leg} \Rightarrow w < r$. Therefore the following chain of implications holds, which was to be shown:
>
> $$SC_t \Leftrightarrow \Delta_t^{opp} < 0 < \Delta_t^{leg} \Rightarrow \Delta_t^{opp} < \Delta_t^{leg} \Rightarrow r > w$$

If SC_t holds, then potential plaintiffs will sue if, and only if, it is legitimate. One misinterpretation of this result should be avoided: Judges must not take sueing as a signal of legitimacy. Doing so and deciding in favor of any suit being brought would create an incentive for opportunistic litigation. The reason is quite simple: To decide like this means $r = w = 1$, which implies zero detection skill. But SC_t requires positive detection skill. Even if SC_t holds and the "selection" between opportunistic and legitimate suit works, the judge has to examine each case with positive detection skill[27].

This Lemma enables us now to derive the main result of this paper, as stated in the following Theorem:

> **Theorem:** Given $\hat{\Gamma}$ and a cost allocation rule t such that $\forall s \in \{leg; opp\}$: $\partial p_t / \partial q^j \leq 0$, then positive detection skill is necessary (but not sufficient) for bilateral contractual compliance.

[27] Polinsky/Rubinfeld 1993 discuss the same problem and come to a different solution. Even if their mechanism to deter frivolous suits works, they claim that the probability of frivolous suits needs to be positive. We avoid this contradictory result by only requiring that the mechanism must not keep judges from being alert.

Proof: From Lemma 1 it follows that bilateral contractual compliance implies CC_t, which by Definition implies SC_t. Lemma 2 stated $SC \Rightarrow r > w$. Since the implication is transitive, the Theorem follows: Q.E.D.

Hence it is necessary for bilateral contractual compliance that the potential litigants perceive judges to have positive detection skill, even if judicial benevolence is assumed. Or, to use an equivalent formulation: With the perception of zero (or negative) detection skill, "in, honor, not" is not the unique subgame perfect equilibrium path in $\hat{\Gamma}$. This result holds at least for the broad set of cost allocation rules we take into consideration[28]. The Theorem might provide an explanation why papers that have implicitly assumed zero detection skill disregarded the idea of contractual compliance and limited their focus to the decision between settlement and trial.

With judges of zero detection skill and $t \in \{a; b\}$, it is impossible to fix litigation fees P and D such that Charlie and Lucy are motivated to honor their contractual obligations. If the CC_t does not hold, then at least one of the parties must be afraid that the other one will deviate from the path "in, honor, not". A judge of positive detection skill with an appropriate specification of t, P and D commits each of the parties to the path "in, honor, not" and allows them to rely on the expectation that the opponent is committed as well. But with zero detection skill, this commitment is impossible.

Note that the result stated in the theorem is independent of what means are available to the parties during the litigation process: Even if one takes settlement, counterclaims and pre-trial discovery into account or assumes that the parties' expenses have an influence on the probability to prevail, these steps of the litigation stage would influence the values of Δ_t^s and δ_t^s, but the theorem is valid in any of the cases. To influence the parties' underlying behavior and motivate them to bilateral contractual compliance, CC_t must hold: in $\hat{\Gamma}$ this means $\Delta_t^{opp} < 0 < \Delta_t^{leg}$ and $\delta^{leg} < -X$. In the following chapter we derive Δ_t^s, δ_t^s for our previously made assumptions. This serves to evaluate whether it is possible for bilateral contractual compliance to be induced under the American and under the British cost allocation rules.

4. Application to the American and the British rules

4.1 Expected effects on payoffs through litigation

The following **figure 6** states the expected effects on the payoffs if Charlie brings suit. Remember that Δ_t^s is the expected effect which litigation has on Charlie's payoff, and δ_t^s is the effect Lucy expects on her payoff. These expected effects depend on whether the status s of the case is opportunistic (opp) or legitimate (leg), on the value of the case X and on litigation cost regime $(t, P, D); t \in \{a; b\}$. P, D consists of fees, since the parties' expenses are assumed to have no influence on the probability that the plaintiff

[28] A caveat that is not really an imposition since the excluded rules are unrealistic.

prevails, denoted as q^s. The litigation stage is limited to a judicial decision: We do not take settlement, discovery and counterclaims into regard. The aim is to derive conditions for bilateral contractual compliance.

Figure 6: Expected effects on the parties' payoffs

t	a	b
Δ_t^s	$q^s \cdot X - P$	$q^s \cdot X - (1-q^s)(P+D)$
δ_t^s	$-q^s \cdot X - D$	$-q^s \cdot (X+P+D)$

Given the American rule, Charlie gets X if he prevails (this happens with probability q^s) and nothing otherwise. In both of these cases he has to bear his own litigation fees P. Lucy has to pay X with probability q^s and to bear her fees D. With probability $1-q^s$, she has to pay nothing and receives no imbursement for her fees D.

Under the British rule, Charlie receives X and the reimbursement for his litigation fees P with probability q^s. If he loses the case, he has to pay the whole litigation fees $P+D$, which occurs with probability $(1-q^s)$. If Charlie prevails, Lucy has to pay X and the whole fees $P+D$. Otherwise her expected payoff effect is zero.

Using these expressions for the expected effects on the payoffs resulting from litigation, we can now specify the conditions for bilateral compliance for the two different litigation cost allocation rules. According to Lemma 1, bilateral contractual compliance under rule t will occur if the Compliance Condition CC_t holds, i.e. $(\Delta_t^{opp} < 0 < \Delta_t^{leg}) \wedge (\delta_t^{leg} < -X)$. Substituting the expressions given in **figure 6**, this gives the Compliance Condition for the American rule C_a:

$$\begin{aligned} CC_a \quad &\Leftrightarrow \quad P \in]wX, rX[\wedge D > (1-r)X \\ &\Leftrightarrow \quad w < \frac{P}{X} < r > \frac{X-D}{X} \end{aligned}$$

To restate the Compliance Condition for the British rule C_b, we first define $m(w,r) := \max\{\frac{1-r}{r}; \frac{w}{1-w}\}$. Then the Compliance Condition is

$$\begin{aligned} CC_b \quad &\Leftrightarrow \quad (D+P) \in]m(r,w) \cdot X, \frac{r}{1-r} X[\\ &\Leftrightarrow \quad w < \frac{P+D}{X+P+D} < r > \frac{X}{X+D+P} \end{aligned}$$

From the second rows of these formulations for CC_a and CC_b, it can easily be seen that the result stated in the Theorem holds for both the British and the American rules. The perception of positive detection skill (i.e. $r > w$) is necessary, however not sufficient, for bilateral contractual compliance.

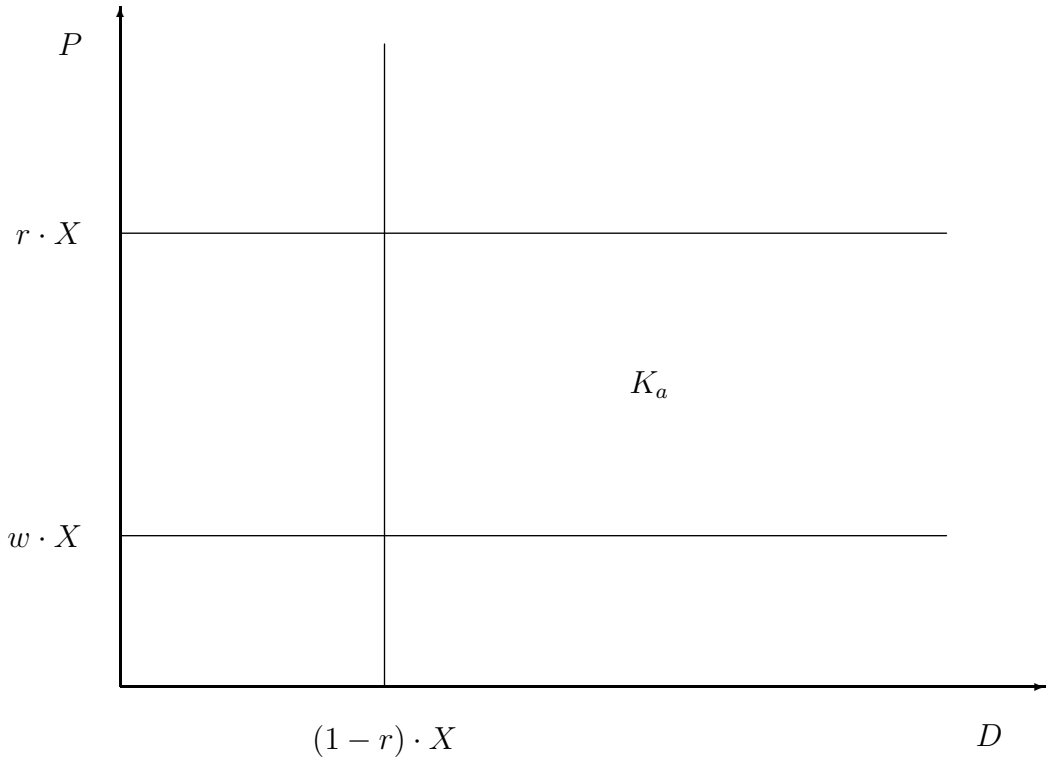
4.2 Sets of litigation fees supporting compliance

4.2.1 Compliance corridor for the American rule

For each of the two cost allocation rules we define the set of (D, P) combinations that support bilateral contractual compliance as K_t. The graphical representation we call the *contractual compliance corridor*. For the American rule, this corridor (see **figure 7**) is given by

$$K_a = \{(D, P) | D > (1 - r)X \wedge P \in]wX, rX[\}$$

Figure 7: Set of litigation fees that supports compliance, American rule given



The American rule does not only require $r > w$ as a necessary condition for bilateral contractual compliance (with $r = w$, the corridor between the two horizontal lines in **figure 7** would be empty, since the borderlines do not belong to the compliance corridor).

A second necessary condition is that D needs to be positive. The defendant's litigation fee is a negative externality the plaintiff creates by bringing suit. The american rule requires this externality to induce bilateral contractual compliance. If D is too small, the Compliance Condition CC_t is impossible to hold. In this case, Lucy will prefer her action "cheat" over "honor", which keeps Charlie from doing what he promised to do in the contract.

This makes it clear that bilateral contractual compliance does not only require to solve the problem of litigational opportunism, but also to prevent contractual opportunism. Even if SC_t holds, D can be specified as too small, so that the CC_t does not hold. In **figure 7**, this case is represented by the box left of the compliance corridor K_a. Besides the prevention of litigational opportunism, there must be an incentive for the potential defendant to honor the contract instead of cheating and being sued.

This result concerning the American rule has a normative implication, which might sound somewhat surprising: If the parties, as we assumed here, do not make investments in the case aside from the litigation fees, the legislator should threaten potential defendants by charging a fee $D > (1 - r)X$ in case of litigation. Defendants need to be punished for being sued. Failure to do so keeps "in, honor, not" from being the unique subgame perfect equlibrium path - either "in, cheat, sue" or "out" will be played by the parties if only SC_t, but not CC_t, holds.

4.2.2 Compliance corridor for the British rule

With K_b we denote the set of (P, D) combinations that support bilateral contractual compliance under the British rule. The compliance corridor

$$K_b = \left\{ (D, P) | (D + P) \in \right] m(r, w) \cdot X, \frac{r}{1 - r} X \left[\right\}$$

is shown in **figure 8**.

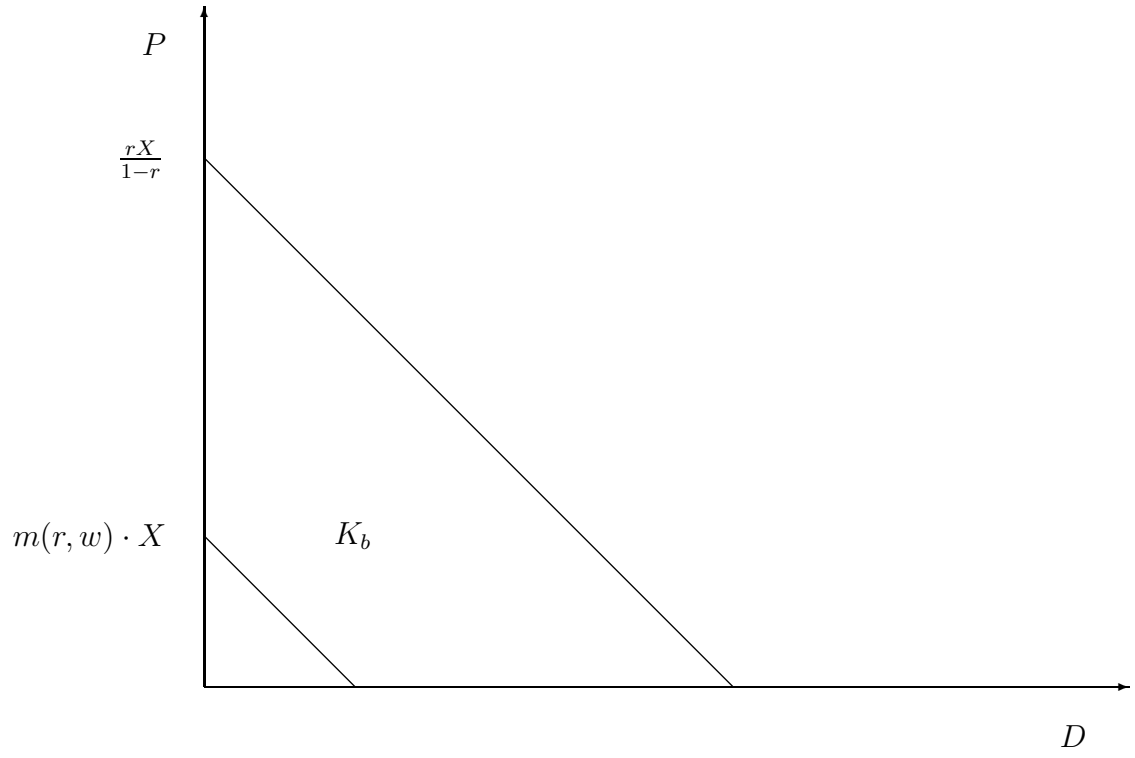
Under the British or European rule, a minimum fee for being sued is not necessary for bilateral contractual compliance. In case of zero detection skill, the compliance corridor is empty. With $r > w$ the corridor in **figure 8** is non-empty. In contrast to the American rule, $D = 0$ does not exclude bilateral contractual compliance.

4.2.3 Comparision of the American and the British rule

Under the British rule, either player's fee can be seen as a kind of externality that is - at least partly - internalized to the other player by this rule. As long as $P > 0$, a potential defendant has to expect a positive ex-post burden. The same holds for the plaintiff: If he brings suit, even with $P = 0$, he has to take a positive expected burden into account.

The literature on litigation costs provides at least two arguments in favor of the Ameri-

Figure 8: Set of litigation fees that supports compliance, British rule given



can rule: Adams 1995[29] mentions that the externality created by the British rule is a source of inefficiency that, if to be borne by rightholders, weakens the right for which they seek protection[30]. Posner 1973 was the first who said that the American rule provides a weaker incentive to refuse settlement. Compared with settlement, trial is seen as an inefficient device for conflict resolution, hence this leads to the conclusion that the American rule is the efficient one.

Since we analyze the incentive effect of litigation on the underlying behavior, our result does not favor either of the two rules[31]: If judges are perceived to have positive detection skill, then both of the rules can support bilateral contractual compliance. Under both of them provide a non-empty set of (P, D) combinations is derivable that makes the parties honor their contractual promises and keep out of the courts. To state this formally:

$$\forall t \in \{a; b\} : (P, D) \in K_t \Leftrightarrow bcc$$

Hence both of the rules are able to induce an efficient outcome in the game form $\hat{\Gamma}$. The

[29] p. 81, 87.

[30] However, Adams 1995 favors the british rule.

[31] Hence our model does not explain why two different rules exist. Adams 1995 claims that the different roles of judges in the different court systems should be seen as the decisive factors why different rules evolved.

possibility to litigate is only important as a threat if the potential defendant chooses cheat instead of honor; but in equilibrium this threat will not be carried out. Then the parties act "in the shadow of the court" without actual litigation taking place. In case of zero detection skill, neither of the two rules can guarantee bilateral contractual compliance.

4.3 Sets of detection skill that support compliance

In the previous section we derived sets of (P, D) combinations that support bilateral contractual compliance for given values of r, w and a given litigation cost allocation rule t. For each of the two cost allocation rules under consideration, we can also derive from the condition for bilateral contractual compliance, CC_t, a set of (r, w) combinations that support bilateral compliance, if P and D are given. For rule t we denote this set as F_t, and call it the "compliance field". For the American rule, the compliance field is

$$F_a = \left\{ (r,w) | w < \frac{P}{X} < r > \frac{X-D}{X} \right\}$$

and for the British rule it is

$$F_b = \left\{ (r,w) | w < \frac{P+D}{X+P+D} < r > \frac{X}{X+P+D} \right\}$$

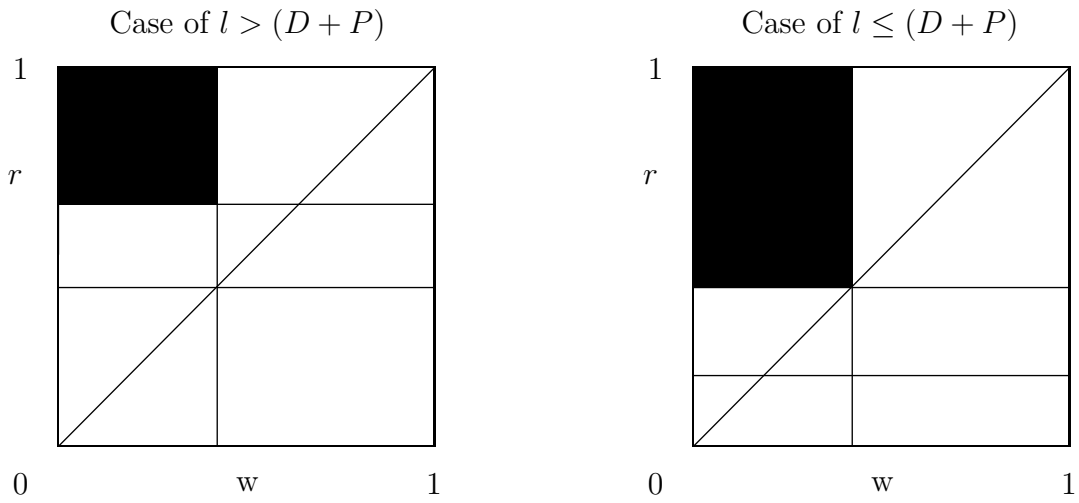
From these expressions, as well, the result stated in the Theorem can easiliy be seen: With zero (or even negative) detection skill $r = w$, the r, w combination is not in the compliance field and bilateral contractual compliance cannot occur. To state this formally: $\forall t \in \{a; b\} : r \leq w \Rightarrow (r, w) \notin F_t$

Despite the fact that the exact position of their lower and right borderlines is different, in a unit box (with r on the vertical and w on the horizontal axis) the graphical representations of these two sets (see **figure 9**) appear to look similar.

For both of the rules, two cases are to be distinguished:

- If $X \leq (D + P)$, then the right inequality in the description of the set F_t is not a binding condition. In a (r, w) unit box, the set F_t is a rectangle with its lower right corner on the $(r = w)$ line (its upper left corner is the point $r = 1, w = 0$). This case is shown in the right part of **figure 9**.
- If $X > D + P$, the right inequality is a binding condition. This case is depicted in the left part of **figure 9**. The set F_t is represented as the dark square in the upper left corner of the unit box. Due to the additional binding constraint, its lower right corner does not touch the $(r = w)$ line. The exact positions of the set's borderline depend on which rule $t \in \{a; b\}$ is being considered.

Figure 9: $r - w-$combinations that support bilateral contractual compliance



For both of these cases this result provides a testable hypothesis: If the two parties comply to a contract, given the parameters (X, Y, Z) and the litigation cost regime (D, P, t), our model predicts that those parties that decide to honor the contract perceive the judge to have $(r, w) \in F_t$. In regard to parties that are confronted with this situation and do not honor their contractual agreement, the model predicts that their perception of the judicial detection skill is (r, w) is not in F_t.

5. Conclusions

In the paper we showed that bilateral contractual compliance requires judicial positive detection skill as a necessary (but not sufficient) condition. This result is independent of the potential litigant's risk attitude. With positive judicial detection skill and appropriately designed litigation fees, contracting parties can be motivated to comply with their contract and carry out the promises they agreed upon. In this case, the mere existence of the enforcement system makes the parties comply - they act "in the shadow of the courts".

The result we state in our Theorem does not depend on the procedure that takes place in the litigation stage. Even if settlement, counterclaims or discovery are taken into regard or if one assumes that the parties' expenses on the case have an influence on the probability to prevail, the incentive structure must be such that the Compliance Condition holds to guarantee bilateral contactual compliance. Under the assumption that in the litigation stage these options are not available and only a judicial decison occurs, we showed that the American rule and the British rule provide the possibility to prevent litigational as well as contractual opportunism.

In sequel papers, we plan to apply the idea of judicial detection skill to tort and criminal cases. Besides this, empirical research should be done to show the link between perceived judicial detection skill and contractual compliance. We will analyze contracts where both of the inputs are imperfectly verifiable, hence both of the parties should have the opportunity to sue, or where the parties have the choice between actions of different degrees of verifiability. Parties may have different perceptions of (r, w) or their investments may have influence on the probability to prevail, thus on the outcome of the case. The decision-making problem of judges should be described from the viewpoint of imperfect decision-making theory to give a rationalization for the perception of $r > w$. We hope this approach to provide new insights on multi-level court systems.

Our result gives a plausible explanation why most of the literature on the economic analysis of litigation does not analyze the underlying behavior that might lead to trial, and focuses on the decision between settlement and trial: The implicit assumption of zero judicial detection skill made by these papers would lead to the result that the law enforcement system is not able to motivate interacting parties to bilateral contractual compliance.

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List of Symbols

a	American cost allocation rule (each party bears own costs)
b	British or European rule (loser bears both parties‘ costs)
bcc	Bilateral contractual compliance: "in, honor, not" is the unique subgame perfect equilibrium path in $\hat{\Gamma}$
C_j	Charlie's decision node $j \in \{1; 2; 3\}$
CC_t	Compliance Condition: $\delta_t^s < -X \wedge SC_t$
cheat	Lucy's action to not honor the contract
$d_t(D, P, q^j)$	Expected ex-post litigation costs to the defendant, given rule t
D	Defendant's litigation fees (to be paid ex-ante)
δ_t^s	Expected effect on Lucy's payoff by a suit of status s, given cost allocation rule $t \in \{a, b\}$
Δ_t^s	Expected effect on Charlie‘s payoff by a suit of status s, given rule t
F_t	Compliance field: Set of r, w combinations that support bcc, given rule t
fri	Frivolous suit: after paths (out) and (in, honor)
Γ	The basic contract game
$\hat{\Gamma}$	The litigation game form
i	Player; $i \in \{C; L\}$
in	Charlie's action to make his investment Y
j	Index for Charlie's decision nodes $C_j \in \{C_1..C_3\}$
honor	Lucy's action to make her contractual investment X
K_t	Compliance corridor: Set of (P,D) combinations that support bcc, given rule t
L	Lucy's decision node
leg	Legitimate suit: after (in,cheat)
$m(r, w)$	$= \max\{\frac{1-r}{r}l; \frac{wl}{1-w}\}$
not	Charlie's action not to sue
out	Charlie's action not to make his investment Y
P	Plaintiff‘s litigation fee (to be paid ex-ante)
$p_t(D, P, q^j)$	Ex post litigation costs the plaintiff expects, given rule t
q^s	Probability that a plaintiff prevails, given the suit is of status $s \in \{fri; leg\}$
r	Probability that a plaintiff prevails, having brought a legitimate suit
s	Status of a case; $s \in \{fri; leg\}$
SC_t	Selection Condition: $\Delta_t^{fri} < 0 < \Delta_t^{lef}$ (Charlie sues if, and only if, it is legitimate)
sue	Charlie's action to sue for X
w	Probability that plaintiff prevails, having brought an opportunistic suit
X	Lucy's contractual obligation (e.g. some work for Charlie)
Y	Charlie's relation specific investment (advance payment)
Z	Charlie's monetary value from Lucy's investment X