Contracting in the Shadow of the Law

Nicola Gennaioli*

Institute for International Economic Studies, Stockholm University.

Substantially Revised, January 2006 (First Draft, November 2003)

Abstract

I propose the view that the law affects economic efficiency by shaping contractual litigation and contracting as a result. I build a model where judges subject to personal biases try to distort contract enforcement and consider two legal systems, one where judges wield discretion and another where they must follow a code. I find that the law affects contracting by shaping the way biased courts resolve contractual ambiguities: discretion fosters the use of sophisticated contingent contracts, codification the use of simpler non-contingent contracts. Beyond contract form, I find that legal systems fundamentally differ in their ability to enforce complex and innovative transactions, where performance is hard to verify. The code's bias is the cost of codification, the arbitrariness of judges and juries and their incompetence are the costs of discretion. The model sheds light on several findings in law and finance and product liability literatures and yields some implications on the costs and benfits of discretion across areas of law and at different levels of development.

*Email: nicola.gennaioli@iies.su.se. I am indebted to Philippe Aghion and Andrei Shleifer for their invaluable support throughout this project. I have benefited from comments by Gary Becker, Francesco Caselli, Oliver Hart, Louis Kaplow, Michael Kremer, Casey Mulligan, Richard Posner, Ilia Rainer, Stefano Rossi and seminar participants at Chicago, Columbia GSB, Harvard, LSE, Kellogg, Pittsburgh, UCLA, UCSD. I also thank Christina Lönnblad for editorial assistance.

1 Introduction

A rapidly growing empirical literature in Comparative Law and Economics documents an important variation between Common Law and Civil Law countries of several economic indicators. These findings have typically been explained by arguing that different legal systems differently regulate the economy (e.g. Djankov et al. 2003). Yet, this explanation is at odds with the law and finance literature, which shows that the Common Law fosters various aspects of financial development (e.g. Levine 2004). Although Civil Law systems are characterized by regulations reducing the protection of investors against management (La Porta et al. 1998), it is unclear why such regulations should be binding, given that in many countries entrepreneurs and investors can contractually opt out of them (Easterbrook and Fischel 1991). More broadly, the view that the law affects the economy by directly regulating economic activities is challenged by Coase's (1960) proposition that if – as it is most likely in financial transactions – parties can freely contract, then the law becomes irrelevant. Why, then, does the law matter?

The law and finance evidence becomes less puzzling after one realizes that Coase's argument crucially relies on proper contract enforcement. Parties can only get around the law if courts are able and willing to enforce their contracts, but generally not otherwise. As a result, the law may affect the economy via a "contractual channel", i.e. by shaping contractual litigation and enforcement. Recent evidence supports this view by showing that a country's legal system affects financial contracting (e.g. Lerner and Schoar 2005, Qian and Strahan 2004) and the quality of contractual litigation (La Porta et al. 2003, 2005). Yet, the impact of different legal systems on contracting has not received much theoretical attention. In this paper, I present a model of the "contractual channel" where the law shapes courts' enforcement behavior. In line with legal scholars (Damaska 1986, Posner 2004a), who view the degree of discretion as a key determinant of court behavior, I compare two legal regimes, one where judges wield discretion, another where they follow a code.

My analysis relies on two assumptions. First, I assume that in contractual disputes courts may be biased in favor of certain litigants and against others. Under judicial discretion, bias comes from judges' personal beliefs about what is just or efficient and reflects the social, economic and political background of the judge. As stressed by the legal realists (e.g. Frank 1949), bias may lead judges to favor employers or employees, insurance companies or accident victims, managers or shareholders. The evidence confirms the importance of judges' beliefs for rulings on politically sensitive issues (see

Pinello 1999), and on contractual disputes regarding workers' compensation (Beiser and Silberman 1971), insurance coverage (Chesler et al. 1986), firms' bankruptcies (Morrison 2003).[1] But bias does not only arise under discretion. Hayek (1960) and Posner (1992) warn that codes are likely to favor the sovereign or special interests. Hence, also under codification courts are biased if the code itself is biased. Examples abound. Black (2001) and Enriques (2002) show the pro-management bias in Korean disclosure rules and Italian self-dealing regulation, respectively, while Kittner and Kohler (2000) show the pro-worker bias of "fair dismissal" requirements in Germany.

Second, I assume that factual and interpretive ambiguities plague contract enforcement. Crucially, such ambiguities offer biased courts leeway to distort contract enforcement. This is especially true for contracts regulating complex transactions, when judges are called upon to verify and enforce intricate clauses and interpret broad and ambiguous language. Frank (1949) and Posner (2004a) stress that fact-finding gives judges enormous possibilities for subverting contracts in complex and uncertain cases such as when courts need to verify the parties' "good faith", "intent" or "negligence" and evidence is in conflict.

In a model where biased courts take advantage of contractual ambiguities, I study how the degree of discretion affects contracting. In my model, contracting occurs over a transaction where the first best allocation is contingent on an ex-post state of nature that – due to factual ambiguities – courts observe only with noise. My analysis yields two principles. First, the parties choose between the more sophisticated contingent contracts, which mandate a state-dependent allocation, and the simpler non-contingent contracts, which mandate a state independent allocation. Second, biased courts exploit factual ambiguities (the noise of the signal they observe) to distort state verification, and thus the enforcement of contingencies, in favor of their preferred party.

Putting these principles at work, I find that judicial bias shapes contracting costs. Biased courts increase the cost of contingent contracts by reducing the overall precision of state verification and by distorting the relative likelihood of different errors away from their relative social cost. If error costs are asymmetric, the latter effect induces the parties to use non-contingent contracts, which are useful precisely to prevent biased courts to make very costly errors. That is, the parties may prefer to exclude a contingency from their contract if they are afraid that biased courts would exploit it to enforce the corresponding allocation too often. Interestingly, if courts are unbiased, enforcement

[1] As an alternative to bias, Glaeser and Shleifer (2002) study legal systems by assuming judges to be bribed; Bond (2004) shows that judicial bribe taking may render high-powered contracts unenforceable. However, bribe taking is not the only factor affecting the ability of different legal regimes to enforce contracts.

internalizes the relative social cost of different errors and contingent contracts are always optimal, even if judges observe a very noisy signal. Thus, I find that judicial bias is crucial to understand how the use of sophisticated contingent contracts depends on the law.

These findings lead to the key result of the paper, namely that the law affects contracting by shaping judicial bias. The code's bias undermines the parties' willingness to use contingent contracts under codification, the polarization of judges' biases undermines it under discretion. But the law does not only affect the use of contingent contracts, it also affects welfare. If the code is very biased relative to the polarization of judges' biases, then discretion allows the parties to maximize their welfare under better enforced contingent contracts. If instead judges' biases are very polarized, then discretion undermines welfare. The reason is that under discretion judges' biases do not cancel out on average, they reduce the precision of state verification and the use of contingent contracts; hence, a code (albeit biased) may be the best way to constrain biased judges. Crucially, the costs of judicial bias are especially strong for complex and innovative transactions, because greater factual ambiguities give biased courts more leeway to distort enforcement.

The above results use the notion that non-contingent contracts help to counter judicial bias by avoiding ambiguities. Yet, this idea neglects that courts often can distort these contracts via interpretation, which allows judges to introduce extrinsic and ambiguous evidence also in their enforcement (Posner 2004b). For example, a judge may excuse a party's non-performance by arguing that the contract's non-contingent performance is highly inefficient in the current state.[2]

To see how interpretation of non-contingent contracts affects my results, in Section 3 I allow courts to engage in it. My key finding is that under discretion judges massively use extrinsic evidence, de-facto transforming non-contingent contracts into contingent ones. Under codification judges have a greater incentive to enforce non-contingent contracts literally because extrinsic evidence must be used according to the code's bias, not judges' desired one. Interestingly, this implies that, irrespective of judges' biases, discretion fosters the use of contingent contracts. Under discretion enforcement is contingent anyway, so the parties box judges in by writing more detailed contracts. In contrast, under codification the parties use non-contingent contracts to avoid costly errors, relying on the literal enforcement of less activist judges. Courts' interpretive activism is a cost of discretion because it reduces the parties' ability to protect themselves from bias by using

[2]Schwartz (1992) shows how this strategy allows courts to distort enforcement in an example of a buyer who did not perform in a state not covered by the contract: "A court that wants to excuse the buyer will supply a term and stress the parties' failure to consider the situation at hand...A court that prefers to enforce will give the seller damages...the judge will recite the maxim that courts do not make contracts for the parties."

non-contingent contracts. Such cost is greater the less competent judges are. More generally, however, the analysis of interpretation confirms that the efficiency of a legal regime depends on its ability to limit the impact of judicial bias on the enforcement of complex transactions.

To sum up, my analysis yields two broad messages. First, the law shapes contracting by shaping courts' ability to resolve contractual ambiguities. By showing that such ability depends on how the law aggregates judges' biases and information, my analysis departs from the incomplete contracts literature (see Hart 1995), which takes courts' enforcement ability as given. In addition, while that literature studies how alternative arrangements (e.g. ownership allocation) can reduce the parties' opportunism when contracts are not viable, my analysis shows how the parties choose among different contracts to optimally counter courts' opportunism.

Second, the law can crucially affect the economy by shaping litigation and contracting costs as a result. In particular, a key feature of the law is the degree of discretion wielded by courts. The code's bias is the cost of codification, judges' polarization and incompetence are the costs of discretion. Thus, the choice between *discretion* and *codification* ultimately depends on whether society trusts more judges or legislatures. In Section 5 I illustrate this finding by discussing the benefits and costs of discretion across areas of law. I argue that the evidence that the Common Law fosters the use of contingent financial contracts (e.g. Lerner and Schoar 2005) and financial development (e.g. Levine 2004) is consistent with a benefit of discretion in financial transactions. On the other hand, I argue that the costs of U.S. product liability are at least in part due to the discretion of judges and juries. Finally, my emphasis on the enforcement problems plaguing complex transactions implies that the law may especially matter by facilitating or impeding the growth of innovative sectors in the economy. In the conclusion, I exploit this intuition to develop a hypothesis on how the law should vary with the level of economic development.

2 The Model

2.1 Transactions and Contracts

Parties A and B engage in a transaction where they must set an allocation $s \in S$. There are two equally likely states of nature ω_1 and ω_2, which are perfectly observed by A and B ex-post. I assume that there are two allocations a and b such that:

A.1: Ex-ante social welfare is maximized by setting allocation a in state ω_1, allocation b

in state ω_2. Ex-post, party A always prefers to set allocation a, party B always prefers to set allocation b.

The ex-ante optimal allocation (i.e. the first best) is contingent on the state of nature, but ex-post A and B face a conflict. Thus, ex-post the parties may fail to attain the first best, especially if the latter dictates zero-sum ex-post transfers between A and B, or if the parties are wealth constrained. Ex-post bargaining does not lead to the first best because the parties are either unwilling (in the former case) or unable (in the latter case) to bargain: ex-post party A tries to set his preferred allocation a, party B his preferred allocation b. An ex-ante contract is a solution to such a conflict.[3] As a result, this setup allows me to study the effect of contract enforcement on contracting. In particular, my analysis considers the following transactions:

i) Insurance. A and B's future endowment of a perishable consumption good is subject to an idiosyncratic shock $D > 0$. With probability $1/2$, A is endowed with $-D$ units of the good and B with D units. With probability $1/2$, A is endowed with D units of the good and B with $-D$ units. The utility function of party $i = A,B$ is $u_i(c) = c$ for $c \geq 0$, $u_i(c) = (1 + \theta_i)c$ for $c < 0$. $\theta_i > 0$ measures i's risk aversion.[4] An allocation is a transfer from B to A. The first best insurance payment depends on which party is hit by the shock. Calling ω_1 and ω_2 the states when A and B are hit, respectively, this example fits A.1 and we have: $a \equiv$*B pays D to B*, $b \equiv$*A pays D to B*. Notice that, irrespective of ω, A and B always want to receive D.

ii) Consumers and Firms. Consumer A is harmed by firm B's product. With probability $1/2$, the harm to the consumer is high ($\overline{H}$) or low ($\underline{H}$) ($\overline{H} > \underline{H}$). The firm's profit is equal to π, $\overline{H} > \pi > \underline{H}$. An allocation is a damage payment from B to A. If damages are less than harm, the consumer bears a fixed psychic cost P. If damages are larger than profits, the firm incurs a fixed financial distress loss F (for an interpretation of F, see example *iv)*). This example fits A.1 when $0 < F < P$, as it is optimal to award high damages if and only if A's harm is high. By calling ω_1 and ω_2 the states of high and low harm, respectively, we have: $a \equiv$*B pays damages* $\overline{H}$, $b \equiv$*B pays damages* $\underline{H}$. Irrespective of harm, A always wish to receive $\overline{H}$, B always wish to pay $\underline{H}$.

[3] With ex-ante non contractible investments, contracts are also useful in the presence of ex-post renegotiation. For simplicity, I do not consider this case. However, just to give an idea of how the model would work, notice that in this case parties would renegotiate up to the efficient allocation. Yet, since court enforcement is an effective out of equilibrium threat, its biases and inaccuracies affect ex-post rent sharing in renegotiation. Thus, in line with models of *hold up* (see Hart 1995), adjudication shapes the efficiency of ex-ante investment decisions.

[4] I choose to use this "loss aversion" utility function rather than a more general one because, as shall be seen below, it allows me to study all examples *i)* to *iv)* by using a common framework.

iii) Constitutional Design. Old A and young B disagree over public goods: the old wants hospitals, the young schools. The old's (nonmonetary) value of hospitals is $\overline{h}$ or $\underline{h}$ with probability 1/2. The young's value of schools is s, where $\overline{h} > s > \underline{h}$. Parties are wealthless and thus cannot bargain on public goods ex-post. Behind the veil of ignorance (one is A or B with prob. 1/2), they contract over public goods. The first best public goods provision depends on the old's value of hospitals. Calling ω_1 and ω_2 the states of high and low value, respectively, we have: $a \equiv$*hospitals are built*, $b \equiv$ *schools are built*. Irrespective of ω, A always wants hospitals, B schools.

iv) Financial Contracting (Aghion and Bolton 1992). A is a capitalist, B a wealthless entrepreneur. At cost K, the entrepreneur can set-up a two-periods positive NPV project. In the second period, the project only yields a nontransferable private benefit b to the entrepreneur. In the first period, the project yields with probability 1/2 a cash flow of y or 0. Between the first and the second period the project can be liquidated (so that private benefits are lost), yielding a monetary value of K. This example satisfies A.1 if $K < b < 2K$ and $y > 2K$. In the first best A advances K to B and B's repayment depends on the first period cash flow. It is useful to model an allocation as a transfer from B to A in the first period such that, if the transfer is larger than the cash flow, the project is liquidated and the investor obtains K. Calling ω_1 and ω_2 the states of positive and zero cash flows, respectively, we have: $a \equiv B$ *repays* $2K$ *to* A, $b \equiv B$ *repays* 0 *to* A. Irrespective of ω, A only wants to maximize repayment at the expense of continuation (i.e. he prefers a to b), B wants to minimize repayment (i.e. he prefers b to a).

Contracts. In the above examples, a contract consists of a possibly state contingent profile $\{s_1, s_2\}$, which mandates allocation $s_i \in S$ in state ω_i, $i = 1, 2$. Parties can also choose not to contract.[5] In the examples above, contracts do not include monetary incentives $l(s_i)$ from A to B. Incentives are unhelpful if s is zero-sum, infeasible if parties are wealth constrained. This setup, where the main role courts play is to verify the state ω, allows me to capture the idea that a major difficulty courts face in enforcing contracts is to correctly verify the events triggering specific clauses, particularly if these events are complex and hard to verify.

Model timing: at $t = 0$, the parties to a transaction choose the contract maximizing their social welfare. At $t = 1$, the contract they signed is enforced by the legal system to which they belong, possibly with error. I assume that going to court is costless. Notice that social welfare maximization cannot drive contract choice in example *iv)*, as B may fail to break even and refrain

[5] The meaning of "no contract" varies with the example. In *i)* it is simply no insurance; in *ii)* a judge decides on the level of damages (like under $\widetilde{c}$); in *iii)* both parties obtain zero; in *iv)* and *v)* nature randomly sets a or b.

from lending K. In section 5, I study this example separately and show that it sheds some light on the empirical findings of the law and finance literature. For now I focus the analysis on cases *i)* to *iii)*, which all share similar properties.

As the timing of the model suggests, parties write their contract by anticipating how it will be enforced by courts. It is useful to look at a first implication of this assumption. If state verification is perfect, the parties write the contingent contract $\{a, b\}$ "asking" courts to enforce the first best. However, if courts verify ω with error, such contract is costly because sometimes allocation b is erroneously enforced in ω_1, and allocation a is erroneously enforced in ω_2. To reduce error costs, the parties may prefer to use different contracts. In particular, I find that:

Lemma 1 *Under imperfect state verification, the parties choose among contracts* $\widetilde{a} \equiv \{a, a\}$, $\widetilde{b} \equiv \{b, b\}$ *and* $\widetilde{c} \equiv \{a, b\}$.

The parties choose among contingent and non-contingent contracts. Contingent contract $\widetilde{c}$ describes the first best allocation. Non-contingent contracts $\widetilde{a}$ and $\widetilde{b}$ mandate the state independent allocations a and b, respectively.[6] This result shows a useful property of my model, namely that the parties choose from an allocation set essentially consisting of two elements, a and b. This is due to the payoff functions of examples *i)* to *iii)*, where the social cost of misallocations is either assumed to be fixed (as in *ii)* and *iii)*) or to depend linearly on the distance between the optimal allocation and the current one (as in *i)*). In both cases, setting a contractual allocation that is never optimal is unprofitable, as it imposes large misallocation costs in every state.

I could allow for more general payoffs, but this setup conveniently clarifies the effect of adjudication on contracting. In particular, it separates the welfare impact of two key dimensions characterizing the quality of state verification: its overall imprecision and its bias, i.e. the relative likelihood of errors introducing different social costs. Thus, this setup allows me to study how judicial bias affects contracting by separately looking at its impact on the two latter dimensions.

I illustrate this property by showing how courts' mistakes affect contract choice in my model. To this end, call $W^{F.B.}$ the parties' first best welfare. Call I^b the parties' loss relative to the first best when allocation b is set in every state and I^a their loss when allocation a is set in every state. By definition, contract $\widetilde{a}$ yields $W^{F.B.} - I^a$, contract $\widetilde{b}$ yields $W^{F.B.} - I^b$. Crucially, in the examples above I^b and I^a also capture the social cost of verification errors in ω_1 and ω_2, respectively. If

[6] In the proof of Lemma 1 I show that it is strictly suboptimal for the parties to randomize (both in a contingent and in a non contingent fashion) between the allocations that are part of a contract.

courts err in ω_1 with probability m_1 and in ω_2 with probability m_2, then the parties' welfare under $\widetilde{c}$ is:

$$W^{FB} - m_1 I^b - m_2 I^a, \tag{1}$$

i.e. first best welfare minus expected error costs. When b is enforced in ω_1 welfare falls by I^b. When a is enforced in ω_2 welfare falls by I^a.[7] The cost of imperfect state verification under $\widetilde{c}$ is thus an average of error costs in ω_1 and ω_2. For instance, in the insurance example *i)*, $I^b = \theta_A D$ is the cost of underinsuring A, $I^a = \theta_B D$ that of underinsuring B. The total cost of insurance contract $\widetilde{c}$ whereby A is insured in ω_1 and B in ω_2, is an average of the cost of underinsuring A and of underinsuring B. As a result, adjudication shapes social welfare not only via its overall imprecision $(m_1 + m_2)$ but also via the relative likelihood of errors imposing different social costs. This idea is key to understanding how imperfect state verification affects the tradeoff between contingent and non-contingent contracts. Contingent contract $\widetilde{c}$ maximizes the parties' welfare when:

$$\frac{m_2}{1 - m_1} < I^b / I^a < \frac{1 - m_2}{m_1}. \tag{2}$$

As (2) shows, my model features a *flexibility* vs. *insurance* tradeoff between contingent and non-contingent contracts. The *flexibility* of contingent contract $\widetilde{c}$ reduces the overall probability of misallocations to $(m_1 + m_2)/2$ from 1/2, the level prevailing under $\widetilde{a}$ and $\widetilde{b}$. Such flexibility is particularly valuable if state verification is accurate (if $m_1 + m_2$ is small). However, non-contingent contracts *insure* the parties against the worst misallocation, as they induce errors of only one type.[8] Such insurance is valuable if error costs are asymmetric: $\widetilde{a}$ is used if the relative cost of setting allocation b in ω_1 is large (i.e. I^b/I^a is large), $\widetilde{b}$ if such cost is small. In example *i)*, if B is much more risk averse than A (e.g. $\theta_B/\theta_A = \infty$), parties sign a non-contingent contract whereby A always insures B ex-post so as to avoid the worst-case scenario of underinsuring B. The opposite holds when the relative cost of underinsuring A is very large (e.g. $\theta_B/\theta_A = 0$).

Parameter I^b/I^a "summarizes" a transaction in my model by identifying the cost of a *pro-B* error (i.e. of setting b in ω_1) relative to that of a *pro-A* error (i.e. of setting a in ω_2). Parties contract by taking the relative cost of errors in their transaction into account. There is a measure 1 of transactions and:

[7] If in example *i)* parties renegotiate away the randomness of judges' fact finding after ω is realized, expression (1) still holds, provided that the renegotiated transfers are the expected transfers.

[8] As in the costly state verification models (Townsend 1979), the optimal contract minimizes enforcement costs but here the cost of writing contingencies is due to judges' bias and incompetence, not actual verification costs.

A.2.: *Define* $\lambda \equiv I^b/I^a$. λ *is uniformly distributed in* $\left[1/\overline{\lambda}, \overline{\lambda}\right]$.

Thus, my analysis focuses on the measure of transactions using different contracts and on aggregate welfare. For algebraic simplicity, I assume that only one parameter, $\overline{\lambda}$, pins down the extremes of the interval. To sum up, for each transaction λ and state verification policy (m_1, m_2), my model allows (via expression (2)) to determine contract choice by solely focusing on the overall imprecision $(m_1 + m_2)$ of adjudication and on the ratio of different errors (m_1/m_2). I now move on to the central question of the paper, namely: how does the law affect these two dimensions of enforcement quality?

2.2 Fact-Distortion and the Law

Judges enforce $\widetilde{c}$ by verifying the state of nature ω, which in turn implies whether allocation a or b is set.[9] The utility of a generic judge j is:

$$-\beta_{A,j} \Pr(b\,|\omega_1\,) - \beta_{B,j} \Pr(a\,|\omega_2\,) \tag{3}$$

$\Pr(b\,|\omega_1\,)$ is the probability of enforcing allocation b when a is optimal; such *pro-B* error costs $\beta_{A,j}$ utils to the judge, so $\beta_{A,j}$ captures the judge's preference for A. Accordingly, $\Pr(a\,|\omega_2\,)$ is the probability of a *pro-A* error, so $\beta_{B,j}$ captures the judge's preference for B. Ratio $\beta_j = \beta_{A,j}/\beta_{B,j}$ summarizes the judge's relative bias for A. Judges dislike making state verification mistakes, but they do not dislike the two types of mistakes equally.

Judges distort state verification by playing with the interpretation of conflicting pieces of evidence. This is possible because of factual uncertainties: important data may be missing, witnesses may be error prone, the transaction may be very complex (e.g. Frank 1949, Posner 2004b). I model factual uncertainty by assuming that judges observe a (noncontractible) signal about state ω. With probability κ judges observe the true state of nature, with probability $(1-\kappa)$ they observe a noisy signal $\sigma \in [0,1]$ distributed with densities $f(\sigma\,|\omega_1\,) = 2(1-\sigma)$, $f(\sigma\,|\omega_2\,) = 2\sigma$. Larger values of σ signal the occurrence of ω_2 as opposed to ω_1. The signal's precision $\kappa \in [0,1]$ captures the complexity of the transaction and/or judges' competence. The specific forms of the signal's distribution are assumed for analytical clarity only. How do judges distort state verification? Upon

[9] In line with the incomplete contracts literature (Hart 1994), I disallow the use of Maskin-Tirole (1999) revelation games (where A and B are heavily taxed if they do not report the same state ω). Here, such games may not work because the parties are wealth constrained (see Aghion and Bolton 1992). Moreover, although I do not formally study these mechanisms, their power is likely to be significantly weakened if they are executed by incompetent judges, especially if such judges are biased and collude with their preferred party.

observing the signal, judge j verifies ω by maximizing (3). Then, I find:

Lemma 2 *Call $\sigma_j = \beta_j/(1+\beta_j)$. Then, judge j finds state ω_1 if $\sigma \leq \sigma_j$ and state ω_2 otherwise. Error probabilities are $m_{1,j} = (1-\kappa)(1-\sigma_j)^2$ in state ω_1 and $m_{2,j} = (1-\kappa)\sigma_j^2$ in state ω_2.*

Under factual uncertainty, judicial bias leads to fact-distortion. A judge holds for a party he dislikes, only if the evidence strongly favors such party; that is, the judge's willingness to interpret any evidence against B increases in the judge's bias for A (β_j). Figure 1 plots the signal's densities and judge' adjudication after observing σ:

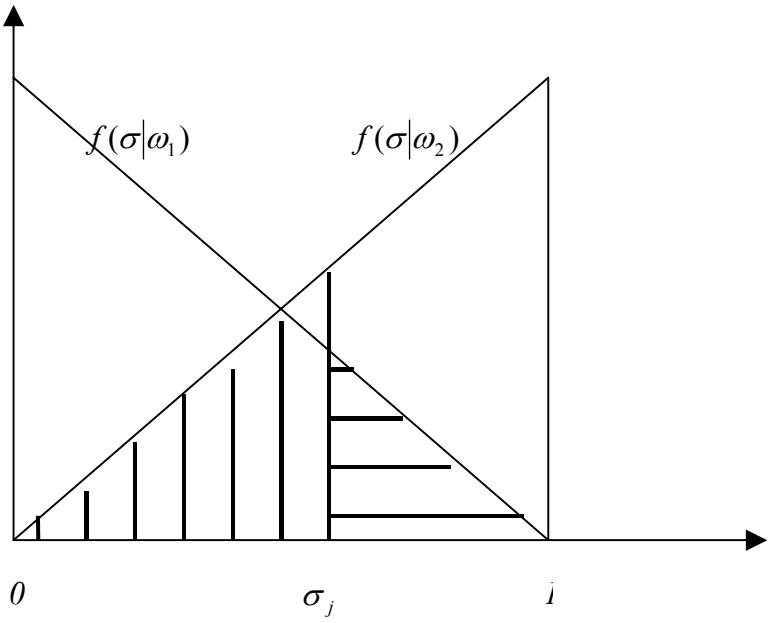

Figure 1

The horizontally shaded area is proportional to the judge's errors in favor of B ($m_{1,j}$), the vertically shaded area is proportional to errors favoring A ($m_{2,j}$). In setting σ_j, factual uncertainties create a tradeoff between these two errors. A more *pro-A* judge interprets the facts so as to make fewer mistakes against A, but he makes more errors against B (i.e. he sets a larger σ_j, inducing a smaller $m_{1,j}/m_{2,j}$). As we shall see later, judicial distortion of the ratio between different errors is a key cost of judicial bias because it may lead judges to make very costly errors too often.

Importantly, judicial bias also increases total errors ($m_{1,j} + m_{2,j}$). A judge favoring a party (i.e. $\beta_j \neq 1$) distorts the use of evidence not sufficiently strong to offset his views, at the cost of making more errors. Thus, a second cost of bias is that when judges play with the facts of a case they reduce the overall accuracy of state verification. In this respect, enforcement quality does

not only depend on the "technological" complexity of a transaction, as measured by the precision of judges' information κ, but also on judicial bias.

Yet, judges use information to some extent ($m_{1,j} + m_{2,j} \leq 1$), the more so the more precise is the signal. Interestingly, not only do judges adjudicate better when their information is precise, but the impact of bias is also smaller: if the case is very complex ($\kappa = 0$) many rulings are plausible and judges decide largely based on bias, whereas bias does not affect the decision of a straightforward case ($\kappa = 1$). The assumed aversion of judges to making errors leads to judicial self-restraint, vindicating the legal realists' assertion that judicial bias is more problematic in complex and uncertain cases. With a perfect signal, judges would always find the true state. Hence, complex transactions are especially vulnerable to bias because they offer judges more leeway to subvert adjudication. We can now turn to consider how different legal regimes shape enforcement quality by differently aggregating court biases and information.

The Legal System. There is a measure 1 of judges who can be of two types: share 1/2 of them are *pro-A*, with $(\beta_{A,j}, \beta_{B,j}) = (\pi, 1)$, the rest are *pro-B*, with $(\beta_{A,j}, \beta_{B,j}) = (1, \pi)$. Parameter $\pi > 1$ reflects both judges' extremism and the polarization of their views: when π is larger, *pro-A* and *pro-B* judges are more extreme and there is more disagreement among them.

I consider two adjudication regimes, *discretion* and *codification*. Under *discretion*, judges have enough flexibility to adjudicate by following their individual biases[10]. Under *codification*, judges must adjudicate by following a code with bias $(\beta_{A,h}, \beta_{B,h}) = (1, \pi_h)$, where $\pi_h > 1$, i.e. the code is (w.l.o.g.) *pro-B*. If π_h is larger, the code is more *pro-B* (if $\pi_h = \infty$, ω_1 can never be found after σ). This code does not directly set allocations (parties can contract over them), but lays out fact-finding procedures, allowing me to study the role of constraints shaping judges' cost of using a given piece of evidence in a party's favor. Legal presumptions, burden of proof allocation, standards of evidence are some of the rules that may play this role.[11]

The mapping from the law to state verification is simple. Judges are randomly allocated to disputes. Then, under *discretion*, fact finding reflects the distribution of judges' biases: in state ω_r $r = 1, 2$, the parties expect errors $m_r = (1/2)(m_{r,A} + m_{r,B})$, an average of the errors made by *pro-A* and *pro-B* judges.[12] *Codification* instead constrains judges to follow the code's fact-finding

[10] Shavell (2005) uses this idea to study the cost and benefits of discretion in the application of rules.

[11] The constraints of *codification* may be imposed through judicial review by a higher court whose preferences are perfectly aligned with those of the sovereign. Given my focus on fact finding, such review here would primarily concern the procedural rules used by lower courts to find ω, because higher courts seldom review fact finding per se.

[12] The assumption of random allocation may reflect the parties' limited information on judges' biases or their disagreement as to which one to select and is not important for my results. If the parties choose their judge,

errors $m_r = m_{r,h}$. For now, in order to focus on bias, I study the case where the precision κ of judges' information is the same across legal regimes and consider the simple case $\kappa = 0$. In section 4, I will resume an important role for κ as a proxy for judges' competence.

Parties contract by taking the law (and the resulting adjudication) as given. This assumption is appropriate for the public legal system, less so for private arbitration tribunals, but my model can be used to study the way arbitration is organized as parties wish to constrain arbitrators depending on the bias and incompetence of the latter. My model can also help analyze the cost of different public legal systems as their substitutability with private ones is unlikely to be perfect. Indeed, the legal system must ultimately enforce arbitrators' decisions (Shavell 1995), arbitration awards can be challenged in court (Posner 2004a) and, unlike courts, arbitrators are not subsidized by the government.[13] In Section 5 I discuss some evidence that confirms such imperfect substitutability by showing the impact of the public legal system on the form and efficiency of financial contracts.

3 Contract Choice and the Law

3.1 Fact Distortion

The first step toward analysing the impact of the law on contracting costs is to study the socially optimal state verification. In this respect, I find that the tradeoff between contingent and non-contingent contracts crucially rests on judicial bias:

Proposition 1 *For each transaction λ, the socially optimal state verification occurs when $\beta_j = \lambda \equiv I^b/I^a$. At this fact-finding policy, contingent contract $\widetilde{c}$ is always chosen.*

Intuitively, bias is defined with respect to λ, the relative social cost of *pro-B* errors. If $\beta_j = \lambda$, the judge is unbiased and sets the ratio between different errors so as to minimize social costs, even if this may reduce the overall precision of state verification. Consider the insurance example once more: if A is infinitely risk adverse ($\lambda = \infty$), then it is so much more costly to underinsure A that unbiased judges enforce $\widetilde{c}$ by always insuring A, i.e. they enforce it like non contingent $\widetilde{a}$.

The idea that unbiased courts internalize the parties' concern for avoiding costly errors is at the heart of the result that if state verification is unbiased, then, irrespective of its precision, contingent

transactions with relatively high λ select more *Pro-A* judges. Yet, unless the supply of unbiased judges is unlimited, the bias of the chosen judge reduces the enforcement quality. The results would then be qualitatively similar to those obtained in sections 3 and 4.

[13] This observation can help explain why arbitrators' awards tend to "split the difference" (Posner 2004a): awards deviating too much from average court behavior will be challenged.

contracts are always optimal. If courts are unbiased, the parties sign $\widetilde{c}$ even in the extreme case where the signal is pure noise (e.g. a coin toss). The intuition is that unbiased courts verify the state of nature so as to maximize social welfare; as a result, by signing $\widetilde{c}$, the parties naturally "ask" courts to condition the allocation on at least some ex-post information. Counterintuitively, "technological" unverifiability (i.e. the noisiness of the signal) does not affect contract form *per se*. To understand how the law shapes contract *form*, we must consider how the former affects judicial bias.

Because Proposition 1 shows that bias must be defined relative to λ, I specify my parametrization of judicial preferences so as to take it into account:

A.3.: *$\pi, \pi_h \geq \overline{\lambda}$, that is, courts are biased with respect to all transactions λ.*

This implies that individual judges and the code are biased with respect to all transactions λ; *pro-A* judges are biased for A (they have $\beta_j > \lambda$) and *pro-B* judges are biased for B (they have $\beta_j < \lambda$).[14] We are now ready to study how the law shapes contracting by affecting the biases of contractual litigation. Under *discretion*, a population of biased courts is left free to adjudicate, under *codification* it is constrained by a code which is itself biased. I find:

Proposition 2 *Under fact-distortion, for every polarization of judges' biases π, there exists a threshold $\pi_h(\pi)$ in the code's bias, such that $\widetilde{c}$ is more often used under discretion if and only if $\pi_h > \pi_h(\pi)$.*

Fact-distortion shapes the cost of contingent contracts. If a legal regime is unbiased, all transactions λ use contingent contract $\widetilde{c}$**.** As bias becomes larger (π, π_h increase above $\overline{\lambda}$), fact distortion becomes stronger and parties protect themselves by using non-contingent contracts, which are not vulnerable to fact distortion. In this case, (2) suggests that $\widetilde{c}$ is used less for two reasons. First, judicial bias reduces courts' precision. Second, it distorts the errors' ratio further from efficiency (this only happens under *codification*, as under *discretion* the errors ratio is always equal to one). Both effects undermine the flexibility benefit of $\widetilde{c}$, inducing the parties to use $\widetilde{a}$ or $\widetilde{b}$. Notice that this tradeoff between contingent and non-contingent contracts hinges on their *ex-post* enforcement costs, not on their *ex-ante* drafting costs as often assumed (e.g. Shavell 2004).

From a comparative standpoint, the result shows that the ability of *codification* and *discretion* to support the use of $\widetilde{c}$ depends on the nature of their respective biases. If the code is very biased

[14] The assumption that judges and the code are biased with respect to all transactions is not important. In particular, I could add a measure of unbiased courts and even allow for a continuum of biases, but my comparative statics with respect to π, the polarization of judges' views, would not change.

relative to the polarization of judges' views ($\pi_h > \pi_h(\pi)$), the former massively subverts fact-finding and the parties are more willing to use contingent contracts under *discretion*. If instead individual judges are very biased ($\pi_h \leq \pi_h(\pi)$), they undermine the performance of contingent contracts, which are now more often used under *codification*. Thus, the constraints the law places on courts shape their ability to verify and enforce complex contractual contingencies and thus contract choice. As I shall discuss in Section 5, this idea sheds some light on recent findings in law and finance showing that the law shapes the use of sophisticated financial contracts (e.g. Lerner and Schohar 2005, Qian and Strahan 2004).

The result that parties counter biased courts by writing non-contingent contracts contrasts with the idea that contingencies may precisely be used to tie the hands of untrustworthy judges, an idea resting on the plausible notion that the complexity of litigation depends on the complexity of the underlying transaction, not just on contract form. In complex transactions, judges are likely to raise interpretive issues (e.g. "does the contract have a gap?", "was an explicit or implied term violated?") that may not be solved by simple contracts. To solve such issues, judges may use extrinsic evidence whose ambiguity allows courts also to distort the enforcement of simple contracts. Thus, to study how bias shapes contracting one must also consider contract interpretation.

3.2 Contract Interpretation

Interpretation is a key aspect of contract enforcement (Posner 2004b, Shavell 2003). Interpretive issues can be resolved by enforcing a contract literally, against the drafter, so as to maximize efficiency (Posner 2004b) in conformity with precedents (Stone 1985). Incomplete contract scholars (e.g. Hart 1995) argue that ex-post interpretation allows courts to restore the optimal state-contingency into incomplete contracts.[15] Yet, as argued in the Introduction, interpretive leeways may also allow biased courts to subvert non-contingent contracts. Does the law affect interpretation? Does interpretation affect contracting?

Because fact distortion can itself be viewed as interpretation of contingent contracts, here I focus on interpretation of non-contingent contracts.[16] My goal is to show how interpretation can allow courts to subvert such contracts by reintroducing state verification into them. The judge decides whether to enforce a non contingent contract literally or to interpret it. In the latter case,

[15] Ayres and Gertner (1989), Anderlini et al. (2003) and Shavell (2004) also stress the benefits of interpretation, asserting that it reduces the parties' ex-ante drafting costs.

[16] In terms of my model, contingent contract $\widetilde{c}$ maximizes judges' welfare (it allows judges to distort state verification but also to benefit from greater accuracy). Hence, judges will try to interpret it by distorting state verification.

he adds to the contract a provision covering a state not considered in the original contract. For instance, a judge interpreting $\widetilde{b}$, can argue that such contract is very inefficient ex-post and add the exception "in ω_1, enforce allocation s with probability q" to it, where s and q maximize expected utility as in (3). This activity is sometimes called "gapfilling". I find:

Lemma 3 *If judges interpret non contingent contracts $\widetilde{a}$ and $\widetilde{b}$, they modify them into contingent contract $\widetilde{c}$.*

By turning $\widetilde{a}$ and $\widetilde{b}$ into $\widetilde{c}$, judges introduce extrinsic evidence into enforcement. From their standpoint, this is desirable for two reasons. First, by using extrinsic evidence judges can reduce overall errors, thus catering to their aversion to making mistakes. Second, they can also "sneak" their bias into enforcement through fact-distortion. In other words, interpretation allows courts to overcome the constraint that non-contingent contracts put on them. But how does courts incentive to interpret contracts depend on the law?

Lemma 4 *Under discretion, judges always interpret non-contingent contracts. Under codification, if the pro-A (pro-B) bias of a judge is sufficiently far from the bias of the code, that judge literally enforces non-contingent contract $\widetilde{a}$ ($\widetilde{b}$).*

Under *discretion*, judges massively interpret non-contingent contracts because they can flexibly use extrinsic evidence in line with their biases. Under *codification*, judges have a smaller incentive to interpret because they must enforce the new (contingent) contract by following the code's bias. This effect stifles interpretation more the less judges' biases are congruent with the code. For example, a very *pro-A* judge is unwilling to modify $\widetilde{a}$ into $\widetilde{c}$, as the *pro-B* code may then constrain him to rule against A too often.[17] The greater interpretive interventionism of judges under discretion leads to the following:

Proposition 3 *When judges can interpret contracts, $\widetilde{c}$ is always used under discretion. Under codification, if judges' biases are sufficiently far from the bias of the code, then non-contingent contracts are still used.*

If courts actively interpret contracts, non-contingent contracts no longer prevent judicial subversion of complex transactions. But then, since enforcement is going to be contingent anyway,

[17] This result may explain why judges operating under detailed codes are generally formalist (Posner 2004a) and why U.S. courts, which wield substantial interpretive discretion (Posner 2004b), are quite activist and often use extrinsic evidence in contract disputes (Schwartz 1992, Schwartz and Watson 2003).

the parties are "forced" to use $\widetilde{c}$. Hence, the law shapes contracting also by shaping courts' incentives toward interpretation. Because *codification* curbs interpretation, it allows the parties to use non-contingent contracts when error costs are asymmetric. Conversely, under *discretion*, the interventionism of judges leads – regardless of judges' biases – to a greater use of contingent contracts. This effect is particularly strong under:

A.4.: *The precision of the signal observed by judges is $\kappa' < \kappa$, if the parties wrote a non-contingent contract.*

A.4. formalizes the idea that contingencies help the parties box in biased judges. By describing all the relevant states and obligations, contingent contracts reduce factual ambiguities, reducing courts' ability to justify deviations from the contract as mere interpretation of its terms.[18,19] Under A.4., the parties strictly prefer to use $\widetilde{c}$ to prevent arbitrary interpretations of $\widetilde{a}$ or $\widetilde{b}$. In principle, parties may also prevent interpretation by contractually opting out of it (e.g. by adding a clause forbidding it). Yet, in reality, courts liberally construe such clauses by questioning their applicability to the current contingency (Posner 1998), their ambiguous meaning (Posner 2004b), or a party's unconscionability (Shavell 2003). Thus, the parties' ability to restrain interpretation is limited. By curbing interpretation, codification better allows the parties to protect themselves from judicial bias.

Thus, the law shapes contracts not only by affecting courts' ability to verify complex contingencies, but also by affecting courts' incentives to adapt simpler contracts to the complexity of the underlying transaction. By fostering courts' activism, *discretion* leads to greater contractual sophistication than *codification*, but such sophistication does not necessarily signal courts' efficiency, it may just signal the parties' distrust for activist judges. More broadly, my analysis suggests that the use of sophisticated contracts in different legal regimes depends on the constraints and incentives courts face when enforcing contracts.

[18] Here is an example of how $\widetilde{c}$ can reduce fact-uncertainty. 1 and 2 are two types of transactions. In 1, the optimal profile is $a(\omega_1), b(\omega_2)$, in 2 is $b(\omega_1), a(\omega_2)$. Judges observe with noise both ω and the type of a transaction. Then, $\widetilde{c}$ reduces fact-uncertainty by eliminating this second source of noise.

[19] If non-contingent contracts are cheaper to write, the parties may delegate their completion to activist judges (Posner 2004, Shavell 2004). My model could be accommodated to capture this effect, but the *ex-post* costs of interpretation I consider would still shape contracts when the parties distrust courts, as they will want to make provision for all contingencies in an attempt to limit their discretion.

4 Welfare Analysis

Beyond contract form, which of discretion and codification maximizes the parties' welfare? Under Coasian irrelevance, the law affects contract form but not welfare, so the answer is both. Alternatively, it may be argued that only the systemic bias of the code hurts welfare since, on average, judges' personal biases cancel out under discretion. I address these issues by first studying welfare under fact-distortion only, i.e. when judges do not interpret non-contingent contracts. I find:

Proposition 4 *Under fact-distortion, for every polarization of judges π, there exists a threshold $\widetilde{\pi}_h(\pi)$ in the code's bias, such that aggregate welfare is higher under codification if and only if $\pi_h \leq \widetilde{\pi}_h(\pi)$. If $\pi_h = \pi = +\infty$, the law is irrelevant.*

By regulating the enforcement bias of courts, the law shapes courts' ability to cope with factual uncertainties. If such bias is so strong (i.e. $\pi_h = \pi = +\infty$) that the parties are constrained to using non-contingent contracts, then the law is irrelevant because under literal enforcement (assumed here) such contracts are equally enforced under any legal system. Thus, the law matters for the enforcement of more sophisticated contractual contingencies.

The cost of codification is the code's bias, the cost of discretion is judges' extremism. If judges are little biased relative to the code ($\pi_h > \widetilde{\pi}_h(\pi)$), *discretion* minimizes fact distortion, thus allowing the parties to attain higher welfare under better enforced contingencies. If instead judges are extremists ($\pi_h \leq \widetilde{\pi}_h(\pi)$) they extensively distort fact-finding, and constraining them with *codification* is efficient. An argument used to downplay the cost of judges' biases is that it is unimportant whether individual judges are moderate or extremists because, as expressed by Cardozo (1921), "the eccentricities of judges balance one another". It is indeed true that under *discretion*, the bias of fact-finding (the ratio between errors) is equal to 1 and balances judges' opinions. Yet, my model disconfirms Cardozo's optimism, for here extremist judges make more errors than more moderate ones. Extreme biases *do not* correct each other: they reduce the precision of state verification and welfare.

Proposition 4 also implies that if judges are biased, it may be optimal to constrain them with a code preventing the use of complex evidence in court. Such evidence may expand, rather than reduce, factual uncertainties, thus giving judges further opportunities for fact distortion. This may explain why, in the face of jurors' vagaries, U.S. rules of evidence are generally regarded as devices for jury control (Posner 2004b). As we shall see in Section 5.2, this intuition is particularly

relevant for U.S. product liability. Reintroducing contract interpretation into the analysis adds to Proposition 4 the following qualification:

Proposition 5 *When judges can interpret contracts, if judges' biases are sufficiently far from the code's bias, codification can dominate discretion even if discretion better enforces* $\widetilde{c}$.

Also interpretation, not only fact-distortion, affects the efficiency of a legal system. In particular, by preventing interpretation, *codification* may reduce the cost of non-contingent contracts and maximize welfare. Figure 2 compares *codification* and *discretion* under contract interpretation.

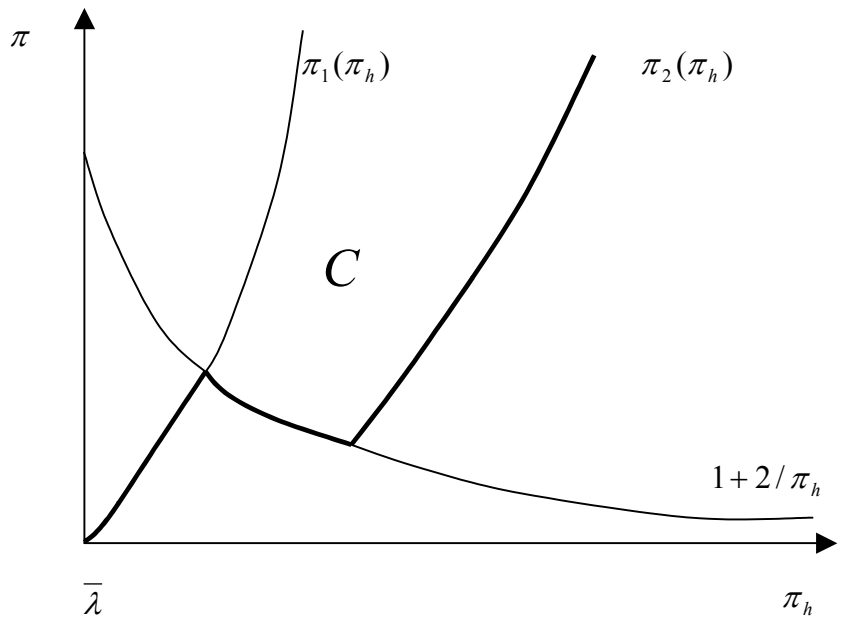

Figure 2

Vertically, the diagram measures judges' extremism π; horizontally, it measures the code's bias π_h. Below $\pi_1(\pi_h)$, judges are relatively moderate and *discretion* enforces contingent contract $\widetilde{c}$ better than *codification*; the bold curve $\pi_2(\pi_h)$ identifies the levels of π above which *codification* is optimal. The key region is C, where the interpretive activism of discretionary judges increases the cost of non-contingent contracts to the extent that *codification* is optimal even if *discretion* better enforces $\widetilde{c}$. This case only arises if codification stifles interpretation, that is if judges' biases are sufficiently far from the code's bias (i.e. $\pi > 1 + 2/\pi_h$). Otherwise, $\widetilde{c}$ is used everywhere and the legal system better enforcing such contract is preferable. Incomplete contract scholars (see Hart 1995) advocate interpretation on the grounds that it allows judges to fill contractual gaps ex-post. Proposition 5 shows this view to crucially rest on unbiased judges: if judges are biased, the parties

may use non-contingent contracts precisely to protect themselves from fact-distortion. As a result, judicial intervention into private transactions through contract interpretation is another avenue through which the legal system may undermine private contracting.

This result suggests two observations. First, in the presence of judicial bias literalism is a superior approach to contract enforcement. Second, because interpretive activism goes hand in hand with judicial discretion, a reason for reducing discretion may be to restrain interpretation. This is particularly true if judges are incompetent. At competence level $\kappa > 0$, I find:

Corollary 1 *With less competent judges (lower κ), the performance of both adjudication regimes falls, but it is harder for discretion to dominate codification.*

If judges are less competent (κ is lower), enforcement quality falls especially under *discretion* – where judges extensively engage in fact distortion when they interpret contracts.[20] Thus, *codification* is especially likely to be efficient if judges are biased and of dubious competence.

Although contract interpretation affects contract form and enhances the importance of judges' competence under discretion, it does not qualitatively alter the comparison between different legal regimes. As Figure 2 shows, the law's efficiency ultimately depends on fact distortion: *discretion* is optimal if and only if judges' biases are moderate relative to the code's bias (i.e., $\pi < \pi_2(\pi_h)$). This is because interpretation is costly only if judges are biased. As a result, the fundamental determinant of the efficiency of a legal system is its ability to enforce complex and innovative transactions, where performance is hard to verify. The law is instead less important for the enforcement of simple transaction, because judges have less opportunities to engage in fact distortion.

Broadly speaking, I found that contractual litigation does not only shape contract form, but also social welfare. The efficiency of an adjudication regime rests on its ability to protect complex transactions from judicial bias and incompetence. These findings can shed some light on private adjudication systems. For example, in her study of private arbitration in the U.S. cotton industry, Bernstein (2001) shows that resolution of disputes between merchants and mills obeys three principles. First, tribunals do not hold hearings, they decide cases solely on the basis of briefs and documentary evidence. Second, tribunals deal with issues of quality, damages and the like by using clear bright-line rules that, unlike those of the Uniform Commercial Code, do not contain for the

[20] Absent contract interpretation, since judges' competence is assumed to equally affect fact distortion across legal regimes, discretion and codification would have the same response to a reduction in κ. However, codes are likely to also affect courts' information (e.g. by imposing rules on the exclusion/admission of evidence). In this case, judges' competence would be even more important for discretion to work and the thrust of Corollary 2 would be reinforced.

most part standard-like words such as "reasonable" or "good faith". Third, unlike public courts, tribunals follow a formalistic approach that does not permit custom or trade usage to trump explicit contractual provisions. As my analysis suggests, these rules may be drafted to reduce the costs of judicial bias and incompetence by limiting courts' discretion in resolving factual and interpretive issues. But my findings can also shed light on the economic impact of the public legal system, and in the next section I use them to discuss the costs and benefits of discretion across areas of law.

5 Applications

5.1 Law and Finance

As discussed in the Introduction, my analysis can help explain the empirical findings of law and finance (e.g Levine 2004) by indicating that a country's legal system – in particular its legal origin – can affect financial development via a "contractual channel." By shaping the enforcement of sophisticated financial contracts, the legal system may determine the ability of investors and entrepreneurs to enhance investor protection contractually.

The hypothesis that a country's legal system affects financial contracting is supported by two recent papers. Lerner and Schoar (2005) find that private equity investments in countries with a Common Law tradition and better law enforcement are more likely to use convertible preferred stock, whereby control rights shift with the performance of the investment, as opposed to common stock. Qian and Strahan (2004) find that – in the same countries – bank loans are more likely to transfer collateral to lenders contingent upon default.[21] Such different use of complex state-dependent contracts across legal regimes results from the parties' choice and not from direct constraints on contract form, and is consistent with the idea that the law shapes courts' ability to enforce sophisticated financial contracts. In line with this view that litigation shapes contracting, Lener and Schoar report that in Peru, a private equity group turned to using majority stakes of common stocks after a litigation with a company in their portfolio, as they were "unable to convince the judge that their preferred stock agreement gave them the right to replace a third generation founder of the company". But Lerner and Schoar (2005) also find that private equity funds investing in common law nations enjoy higher returns, which supports the idea that in financial

[21] Looking at venture capital deals in twenty developed economies, Kaplan et al. (2003) find a weaker association between legal systems and contractual complexity. My model is consistent with their finding because (as I discuss in the conclusion) it suggests that the law should have a smaller impact in rich economies.

transactions the Common Law not only fosters the use of sophisticated contracts, but also allows to attain better outcomes. Also La Porta et al. (2003), document that the ability of the Common Law to reduce the costs and uncertainties of litigation over equity issuances is beneficial for securities markets development. Furthermore, La Porta et al. (2005) stress that the Common Law fosters stock market development also because it enables shareholders to litigate more effectively over self dealing cases by setting, for example, more effective disclosure rules or burden of proof allocation. Overall, these findings indicate that the lower investor protection of civil law systems (La Porta et al. 1998) may indeed reflect a more general anti-investor bias affecting their litigation framework.[22]

Besides indicating that contracting may be behind the Common Law's ability to foster financial development, the law and finance literature points to a benefit of discretion for finance. Indeed, legal scholars (Damaska 1986, Von Mehren 1957) remark that Common Law judges have more discretion than Civil Law ones[23]. In line with my analysis, such discretion may have been responsible for the greater ability of Common Law courts to enforce complex contracts. In particular, the discretion of Common Law courts may have fostered financing by effectively coping with judicial *bias* and *incompetence*.

Regarding bias, as argued by Rajan and Zingales (2003), the Civil Law is vulnerable to opponents of financial development: small groups such as large incumbent industrialists and financiers may easily capture the legislature and enact an anti investor code. These groups can hardly be as powerful in a Common Law system, where adjudicative power is dispersed among many judges. Judicial discretion may thus have reduced the anti-investor bias by leaving unbiased or pro-investor judges free to properly enforce contracts.[24] But also judges' competence is likely to be responsible for the benefit of the Common Law for finance because Common Law judges, who are often drawn from a legal practice where they have acquired some commercial know-how, are quite competent on financial issues (Posner 2004b). To see these arguments in my model, take example *iii)* where financing can either be sustained by $\widetilde{c}$, a contract where the entrepreneur's repayment to the investor optimally falls with the firm's profits, and $\widetilde{a}$, a non-contingent contract that over protects

[22] In an interesting paper, Enriques (2003) shows that in Italy (a civil law country), the code's formal standards make it almost impossible for shareholders to prove in court that managers engaged in self-dealing. This is confirmed by (La Porta et al. 2005), who find that in Italy to directors engaging in sealf dealing are only responsible for damages if shareholders can prove that they acted negligently.

[23] There are three main reasons for this. 1. A greater use of codes/bright line rules (vs. standards) in civil law; 2. The career (vs. lateral entry) nature of judgemanship in civil law; 3. The orality of common law trials, which makes fact findings seldom reviewable. This aspect is very relevant for my model of fact-discretion.

[24] A complementary story emphasizes the law-making discretion of common law appellate judges, which allows them to set efficient rules for dispute resolution (Gennaioli and Shleifer 2005 model this second effect).

the investor, imposing over-liquidation when profits are low. We have:

Proposition 6 *Suppose that $\pi_h = \pi = +\infty$. Then, financing and welfare are greater under discretion (where parties use $\widetilde{c}$) than under codification (where parties use $\widetilde{a}$). The benefit of discretion increases if π is smaller and/or judges are more competent.*

In financial contracting, discretion dominates a very anti-investor code even if judges are very polarized. Indeed, under discretion *pro-investor* judges render $\widetilde{c}$ feasible by facilitating break even. An anti-investor code would make it too hard for courts to verify that profits are high. As a result, the investor does not break even under $\widetilde{c}$ and the parties must use $\widetilde{a}$, whose over-liquidation reduces welfare and debt capacity.[25] Thus, the bias of Civil Law codes may hinder financing by increasing contracting costs, while the discretion of Common Law courts on average guarantees a better contracting framework, especially if judges are competent and/or little biased.[26]

To sum up, my analysis suggests that the Common Law may have fostered financial development because judicial discretion insulated its courts from the anti investor bias of the legislature, allowing them to better enforce sophisticated and innovative financial contracts. This argument has two implications. First, to improve investor rights a country does not need to draft pro-investor regulations, it just needs to lower contracting costs by improving its court system. Second, a way to improve Civil Law courts in financial transactions may be to appoint highly reputable financial professionals as judges and increase their discretion.

5.2 U.S. Product Liability

In contrast to law and finance, U.S. product liability shows the costs of judicial discretion. Federal product liability lawsuits involving personal injury increased sixfold from 1975 to 1989. Many observers (e.g. Viscusi 1991) view with concern the insurance and bankruptcy costs[27] imposed by soaring liability burdens on business firms and blame the discretion of judges and juries, accused of

[25] Incidentally, my model predicts that in an investor-unfriendly system, financial contracts *over-protect* investors (as $\widetilde{a}$ here). This idea is confirmed by Bergman and Nikolaievski (2004), who also bring some supportive evidence from Mexico.

[26] But also interpretation (where I formally modeled only the cost) may render discretion good for financing. Fiduciary duties allow Common Law judges to flexibly detect corporate insiders' misbehavior and read implied terms protecting investors into corporate charters (Coffee, 1999). In civil law systems, better informed insiders may more easily contract around pro-investor laws, certain that formalist judges will never challenge such contracts (Enriques 2003).

[27] Product liability severely hit the private aircraft industry. Average liability costs per plane have risen to $100,000 as aircraft companies are sued in 90% of all crashes involving fatalities or serious injury (pilot error causes 85% of them!). This led some companies (e.g. Cessna) to cease production. See Viscusi (1991).

being biased (often for plaintiffs) and ill-equipped to decide complex issues in areas such as medical malpractice or product safety. In my model, the fact-distortion of biased courts is indeed costly and the constraining value of a code (or the elimination of the civil jury) may be significant. Along the same lines, Viscusi (1991) proposes the use of bright line rules by trained regulators, which would also reduce the discretion of biased and incompetent courts.

Importantly, discretion seems to particularly suffer from the complexity of product liability lawsuits. As my model shows, greater complexity (lower κ) leads to more fact-distortion by biased courts. In example *ii)*, if κ is lower, *pro-consumers* courts are more likely to award high damages. As a result, if firms' bankruptcy costs are large, it may be optimal to limit courts' ability to set high damages with a code. Specifically, in areas of tort where jurors are likely to be confused by battles over technical evidence, a code might contemplate the outright exclusion from trials of complex evidentiary issues. Rather than being beneficial, the noisy information they bring may give courts opportunities to even further distort adjudication.

My analysis has yet another point of contact with product liability. Since product related injuries concern the eminently contractual relationships between buyers and sellers, parties may constrain judges by setting contractual limits on damages, i.e. by signing contract $\widetilde{b}$ in example *ii)* (buyers would gain from a lower purchase price). This Coasian solution, also advocated by Rubin (1993) and Schwartz (1988), would clearly reduce the demand for codification.

Yet, my model indicates that under discretion such contractual solution would not work, because activist judges would interpret private contracts and continue to award high damages. This prediction is consistent with the practice of U.S. courts, which – as reported by Rubin (1993) – refused to enforce the damages stipulated by the parties. Hence, court practices in product liability illustrate another cost of discretion: the activism of biased and incompetent courts into private contracts. Such costs are likely to be important in other fields of law as well (see Chesler et al. 1986 for a study of insurance contracts).

6 Conclusions

I built a model of the "contractual channel" where judges subject to personal biases try to distort contract enforcement. I found that the law affects contracting by shaping the way biased courts resolve contractual ambiguities: judicial discretion fosters the use of sophisticated contingent contracts, codification the use of simpler non-contingent contracts. From a welfare standpoint, I found

that law matters by affecting courts' ability to enforce complex and innovative transactions. In this respect, the code's bias is the cost of codification, the arbitrariness of judges and juries and their incompetence are the costs of discretion. I used these findings to shed some light on the costs and benefits of discretion across areas of law. I argued that while the discretion of judges and juries is a source of the costs of U.S. product liability, common law is good for finance, at least in part due to the discretion wielded by its judges.

This paper is only a first step in the analysis of the "contractual channel" for the law to matter and its analysis can be extended in several ways. For example, it could be explored how the law affects transactions with ex-post renegotiation and ex-ante investments. To sharpen my results, I did not include such transactions in my analysis, but they would make it possible to study how – in line with the property rights literature (see Hart 1994) – the law can affect the organization of firms, e.g. the degree of vertical or horizontal integration across countries and/or sectors.

From a comparative perspective, it might be interesting to study the determinants of judicial bias and incompetence across legal regimes. Although to isolate the effect of adjudication on contracting I took both characteristics as given, they are likely to depend on the law. First, the constraints faced by judges are likely to affect self-selection into judgemanship. Second, codification leaves an important role for (perhaps biased) political institutions.[28] Studying this feedback from the law to bias would fruitfully integrate my analysis of the cost and benefits of discretion.

This paper might also make it possible to empirically identify at the micro level the costs and benefits of discretion across areas of law. In addition, since the costs of legal systems depend on factors such as judges' human capital and the severity of political failures, my analysis may also allow one to study how the law should optimally vary with economic development. In particular, it is plausible that the importance of the "contractual channel" is small in poor, stagnating economies. Not only do such economies offer few opportunities for contracting, but presumably their judges and legislatures are so ineffective that the organization of adjudication is not the main determinant of contracting costs. The law is probably not so important in rich, mature economies either, where not only educated judges efficiently settle disputes, but legislatures – held accountable by educated citizens (Glaeser et al. 2004) – also draft efficient codes.[29] This suggests that the law should matter most at intermediate levels of development, in particular during periods of rapid economic

[28] Relatedly, one can also study how the structure of competition in the market for arbitration services (as well as the supply of arbitrators) may affect the quality of commercial arbitration.

[29] Furthermore, more educated parties will write better – less ambiguous – contracts.

and technological change, when contracts reflect new conditions and the inability of either the political system or judges' beliefs and human capital to adjust to them may cause severe and persistent bottlenecks.

In such circumstances, the nature of economic change is likely to become a key determinant of the cost and benefit of discretion. Discretion allows efficient adaptation to incremental changes (such as the process of factor accumulation) since judges have the flexibility and the accumulated knowledge to effectively implement them. Such flexibility is instead costly in the presence of drastic changes (such as marked technological shifts) that render judges' human capital obsolete, as judges' adaptation to them will be swayed by bias. Moreover, if economic agents' perception of drastic changes is affected by idiosyncratic factors, the political process is likely to reduce the impact of such factors and to aggregate better than courts the information dispersed in the economy.

These principles reflect the basic thrust of this paper: legal institutions effectively support contracting when they counteract judicial bias. The performance of discretion depends on the beliefs and human capital of individual judges, the performance of codification on the functioning of the political system. Thus, my analysis suggests that the choice between discretion and codification ultimately depends on whether society trusts more judges or legislatures.

7 Proofs

Proof of Lemma 1. State verification errors are (m_1, m_2) in ω_1 and ω_2, respectively. Under the payoffs of example *i)*, parties only care about whether A is insured in ω_1 and B is insured in ω_2. Under non zero errors, A is always insured in ω_1 only if $s_i \geq D$, $i = 1, 2$, i.e. $s_2 \geq D$ insures A in ω_1 even if ω_2 is erroneously found. A's insurance in ω_1 is optimally attained with $s_1 = s_2 = D$, i.e. by using $\widetilde{a}$, which avoids costly errors (e.g. extracting too much from B). Accordingly, B is insured in ω_2 if $s_i \leq -D$, $i = 1, 2$, which is optimally achieved if $s_1 = s_2 = -D$, i.e. by using $\widetilde{b}$. If the parties run the risk of being underinsured, they cannot improve over $\widetilde{c}$. First, to avoid underinsuring a party for sure, they need $s_1 \geq D$, $s_2 \leq -D$. But then, it is optimal to set $s_1 = D$, $s_2 = -D$, i.e. to use $\widetilde{c}$. Second, if a party is underinsured for sure and the other is insured for sure, then $\widetilde{a}$ or $\widetilde{b}$ are optimal. Finally, underinsuring both parties for sure is never optimal, which also implies that no contract is never optimal. Thus, the optimal contracts in *i)* is $\widetilde{a}$, $\widetilde{b}$ or $\widetilde{c}$. Consider example *ii)*. The basic choice of the parties is between insuring A or B against psychic or distress losses, respectively. A is insured for sure with $s_i \geq \overline{H}$, $i = 1, 2$. Given the fixed cost nature of distress losses, welfare cannot be higher than under $s_1 = s_2 = \overline{H}$, i.e. under $\widetilde{a}$. Accordingly, the only way to insure B in ω_2 is to set $s_i \leq \pi$, $i = 1, 2$ and welfare cannot be higher than under $s_1 = s_2 = \underline{H}$ (it avoids underinsuring A in ω_2), i.e. under $\widetilde{b}$. If the parties run the risk of underinsurance, then they cannot improve over $\widetilde{c}$. First, to avoid underinsuring a party for sure one needs $s_1 \geq \overline{H}$, $s_2 \leq \pi$, but then, it is optimal to set $s_1 = \overline{H}$, $s_2 = -\underline{H}$. Second, if a party is underinsured for sure while the other is insured for sure, then $\widetilde{a}$ or $\widetilde{b}$ are optimal. Thus, also in *ii)* the optimal contract is $\widetilde{a}$, $\widetilde{b}$ or $\widetilde{c}$. In example *iii)* the optimal contract is either $\widetilde{a}$, $\widetilde{b}$ or $\widetilde{c}$ because the allocation is zero-one. Thus, the best contracts are $\widetilde{a}$, $\widetilde{b}$ and $\widetilde{c}$. In none of examples *i)*, *ii)*, *iii)* is the "no contract" allocation ever used**;** (for *iv)*, see section 5. In *i)* "no insurance" is worse than either $\widetilde{a}$ or $\widetilde{b}$. In the other examples, "no contract" is replicated by a contract. Finally, I only need to check if the optimal contract could be a contingent or non contingent randomization between a and b $\{q_a(\omega_1), q_a(\omega_2)\}$, where $q_a(\omega_i)$ is the probability with which a is set in ω_i (and $1 - q_a(\omega_i)$ is the probability with which b is set). Then, the parties lose $\lambda + [m_2 - \lambda(1 - m_1)]\, q_a(\omega_1) + [(1 - m_2) - \lambda m_1]\, q_a(\omega_2)$ (λ is defined in section 3.1). Since $m_1 + m_2 \leq 1$, if $(1 - m_2) - \lambda m_1 < 0$ (i.e. $q_a(\omega_2) = 1$) then $m_2 - \lambda(1 - m_1) < 0$ (i.e. $q_a(\omega_1) = 1$). From now on, I indicate a contract as $\{q_a(\omega_1), q_a(\omega_2)\}$, where $q_a(\omega_i) \in \{0, 1\}$. ■

Proof of Lemma 2. Judge j enforces $\{q_a(\omega_1), q_a(\omega_2)\}$ by setting, for every perfect signal ω_r, the probability $x_1(\omega_r)$ of finding ω_1 and for every noisy signal σ, the probability $x_1(\sigma)$ of finding

ω_1. Since $f(\sigma\,|\omega_1\,) = 2(1-\sigma)$, $f(\sigma\,|\omega_2\,) = 2\sigma$, judge j picks $x_1(\omega_r)$, $x_1(\sigma)$ so as to maximize:

$$-\beta_{B,j}\left[q_a(\omega_1) - q_a(\omega_2)\right]\left\{(\kappa/2)\left[x_1(\omega_2) - \beta_j x_1(\omega_1)\right] + (1-\kappa)\int_{\sigma}\left[f(\sigma\,|\omega_2\,) - \beta_j f(\sigma\,|\omega_1\,)\right]x_1(\sigma)d\sigma\right\}. \tag{4}$$

When $q_a(\omega_1) > q_a(\omega_2)$, then after ω_1 the judge sets $x_1(\omega_1) = 1$, after ω_2 he sets $x_1(\omega_1) = 0$ (unless his bias is infinite). For every σ**,** judge j sets $x_1(\sigma) = 1$ if $\sigma \leq \beta_j/(1+\beta_j)$ and $x_1(\sigma) = 0$ otherwise. Thus, judge j errs with probabilities $m_{1,j} = (1-\kappa)1/(1+\beta_j)^2$, $m_{2,j} = (1-\kappa)\beta_j^2/(1+\beta_j)^2$. ■

Proof of Proposition 1. Optimal fact finding maximizes (1). A judge with $(\beta_{A,j}, \beta_{B,j}) = (I^b, I^a)$, i.e. with $\beta_j = \lambda = I^b/I^a$ chooses the socially optimal threshold on σ. If m_1 and m_2 are optimal, then parties always choose $\widetilde{c}$ because at the optimum $\lambda = (m_2/m_1)^{1/2}$ and (2) is always fulfilled. ■

Proof of Proposition 2. The proof proceeds in three steps. 1. *Discretion.* $m_1 = m_2 = (1+\pi^2)/2(1+\pi)^2$. Using (2), define $l_-^D(\pi) \equiv (1+\pi^2)/(1+\pi^2+4\pi)$ and $l_+^D(\pi) \equiv (1+\pi^2+4\pi)/(1+\pi^2)$. $\widetilde{c}$ is used with probability $P_D(\pi) = \lambda_+^D(\pi) - \lambda_-^D(\pi)$. $\lambda_-^D(\pi) \equiv \max\left[l_-^D(\pi), 1/\overline{\lambda}\right]$ and $\lambda_+^D(\pi) \equiv \min\left[l_+^D(\pi), \overline{\lambda}\right]$. $P_D(\overline{\lambda}) > 0$, $P_D(\infty) = 0$. $P_D(\pi)$ decreases in π. 2. *Codification.* $m_1 = [\pi_h/(\pi_h+1)]^2$, $m_2 = [1/(\pi_h+1)]^2$. Define $l_-^C(\pi_h) \equiv 1/(2\pi_h+1)$ and $l_+^C(\pi_h) \equiv (\pi_h^2 + 2\pi_h)/\pi_h^2$. $\widetilde{c}$ is used with probability $P_C(\pi_h) = \lambda_+^C(\pi_h) - \lambda_-^C(\pi_h)$. $\lambda_-^C(\pi_h) \equiv \max\left[l_-^C(\pi_h), 1/\overline{\lambda}\right]$ and $\lambda_+^C(\pi_h) \equiv \max\left\{1, \min\left[l_+^C(\pi_h), \overline{\lambda}\right]\right\}$. $P_C(\overline{\lambda}) > 0$ and $P_C(\infty) = 1 - 1/\overline{\lambda}$. $P_C(\pi_h)$ decreases in π_h. 3. *Comparison.* $\widetilde{c}$ is used more under *discretion* iff $P_D(\pi) \geq P_C(\pi_h)$. By continuity, for every π, there exists a $\pi_h(\pi)$ such that $P_D(\pi) \geq P_C(\pi_h)$ iff $\pi_h > \pi_h(\pi)$. When defining $\pi_h(\pi)$, notice that if π is such that $P_D(\pi) < P_C(\infty) = 1 - 1/\overline{\lambda}$, one must set $\pi_h(\pi) = \infty$. If π is large enough, there may not be a code so biased that $P_D(\pi) \geq P_C(\pi_h)$. Yet, for $\overline{\lambda}$ not too large, there always exist values (π, π_h) such that $P_D(\pi) \geq P_C(\pi_h)$. This is particularly true for $\overline{\lambda} \leq 2$, as $P_D(\overline{\lambda}) = 1$. $\overline{\lambda}$ must not be too large otherwise judicial bias is too intense $(\pi, \pi_h > \overline{\lambda})$. Large $\overline{\lambda}$ favors the use of $\widetilde{c}$ under the code as $P_C(\infty) = 1 - 1/\overline{\lambda} > 0$. Yet, although for $\lambda > 1$ $\widetilde{c}$ is used also under a very biased code, its performance is very similar to $\widetilde{b}$, as the very *pro-B* code always triggers allocation b. ■

Proof of Lemma 3. If j interprets contract $q_a \in [0,1]$, he makes sets $q_a(\omega_r) \neq q_a$ in state ω_r while keeping $q_a(\omega_{-r}) = q_a$, where $q_a(\omega_1) \geq q_a(\omega_2)$, (i.e. $q_a(\omega_r)$ is consistent with efficiency). A judge interpreting $\widetilde{b}$ enforces $(q_a(\omega_1), q_a(\omega_2) = 0)$, a judge interpreting $\widetilde{a}$ enforces $(q_a(\omega_1) = 1, q_a(\omega_2))$. If m_1, m_2, the new contract maximizes (4), i.e. $-\beta_{B,j}\left\{\beta_j - q_a'(\omega_1)\left[\beta_j(1-m_1) - m_2\right] - q_a'(\omega_2)\left[\beta_j m_1 - (1-m_2)\right]\right\}$, which is linear in $q_a(\omega_1)$ and $q_a(\omega_2)$, so the new probabilities will be

set either 0 or 1. If the judge modifies $\widetilde{a}$ and $\widetilde{b}$, he turns them into $\widetilde{c}$. ■

Proof of Lemma 4. A judge interpreting $\widetilde{a}$ or $\widetilde{b}$ turns them into $\widetilde{c}$ (Lemma 2 and 3). Then (4) implies. 1. *Discretion.* Judge j enforces $\widetilde{c}$ using $m_{1,j}, m_{2,j}$. Since $\beta_j(1-m_{1,j})-m_{2,j}\geq 0$, $\beta_j m_{1,j}-(1-m_{2,j})\leq 0$, j interpret both $\widetilde{a}$ and $\widetilde{b}$. 2. *Codification.* Judge j enforces $\widetilde{c}$ using $m_{1,h}, m_{2,h}$. There are three cases. *i)* $\beta_j(1-m_{1,h})-m_{2,h}<0$. j does not interpret $\widetilde{b}$ but interprets $\widetilde{a}$ (as $m_{2,j}<1/2$ and $m_{1,h}+m_{2,h}\leq 1$); *i)* holds for *pro-B* judges if $\pi>1+2\pi_h$. *iii)* $\beta_j m_{1,h}-(1-m_{2,h})>0$. j does not interpret $\widetilde{a}$ but interprets $\widetilde{b}$; *ii)* holds for *pro-A* judges if $\pi>1+2/\pi_h$. *iii)* Otherwise, $\beta_j(1-m_{1,h})-m_{2,h}\geq 0$, $\beta_j m_{1,h}-(1-m_{2,h})\leq 0$, and j interprets both $\widetilde{a}$ and $\widetilde{b}$; ■

Proof of Proposition 3. Under interpretation parties choose from $\widetilde{a}$, $\widetilde{b}$ and $\widetilde{c}$. If j interprets q_a with probability g_j into $q_a(\omega)_j$, under q_a parties lose:

$$(1-\int_j g_j)L_{q_a}+E_j(L_{q_a(\omega)_j}). \tag{5}$$

L_{q_a} is the loss if $g_j=0$, $L_{q_a(\omega)_j}$ if $g_j=1$. $\widetilde{a}$, $\widetilde{b}$ or $\widetilde{c}$ minimizes (**??**) both if $g_j=0$, and if $g_j=1$, as $\widetilde{c}$ is the best contingent contract. At (m_1,m_2), parties lose $(\lambda m_1+m_2)(1-\kappa)$ under $\widetilde{c}$, 1 under $\widetilde{a}$ and λ under $\widetilde{b}$ if they are literally enforced. Under interpretation they lose $(\lambda m_1+m_2)(1-\kappa')$. 1. *Codification.* From Lemma 4, if parties use $\widetilde{b}$, *pro-A* judges interpret it; *pro-B* judges not iff $\pi\geq 2\pi_h+1$. If parties use $\widetilde{a}$, *pro-B* judges interpret it, *pro-A* judges not iff $\pi\geq 1+2/\pi_h$. Under $(m_{1,h},m_{2,h})$, the parties always use $\widetilde{c}$, except when $\pi\geq 1+2/\pi_h$ and $1+\kappa'>2\kappa$, as parties use $\widetilde{a}$ if $\lambda>\widetilde{\lambda}(\pi_h,\kappa)\equiv\min\left[\widetilde{l}(\pi_h,\kappa),\overline{\lambda}\right]$, where $\widetilde{l}(\pi_h,\theta)\equiv\left[\pi_h^2+2\pi_h+2\kappa\right]/(1+\kappa'-2\kappa)\pi_h^2$. 2. *Discretion.* From Lemma 3, $\widetilde{a}$ and $\widetilde{b}$ are always turned into $\widetilde{c}$ and $\widetilde{c}$ is always used. ■

Proof of Proposition 4. Under *discretion*, aggregate losses are proportional to $L_D(\pi)=\int_{1/\overline{\lambda}}^{\lambda_-(\pi)}\lambda d\lambda+\int_{\lambda_-(\pi)}^{\lambda_+(\pi)}\left[\lambda m_{1,d}+m_{2,d}\right]d\lambda+\int_{\lambda_+(\pi)}^{\overline{\lambda}}d\lambda$, under *codification* to $L_C(\pi_h)=\int_{1/\overline{\lambda}}^{\lambda(\pi_h)}\left[\lambda m_{1,h}+m_{2,h}\right]d\lambda+\int_{\lambda(\pi_h)}^{\overline{\lambda}}d\lambda$. Functions $L_Y(x)$ increase in x. *Discretion* is better iff $L_D(\pi)\leq L_C(\pi_h)$. Thus, for every π, there is a $\widetilde{\pi}_h(\pi)$, such that *discretion* dominates iff $\pi_h>\widetilde{\pi}_h(\pi)$. Like in proposition 2, if π is very large one should set $\widetilde{\pi}_h(\pi)=\infty$. Yet, for $\overline{\lambda}\leq 2$, $E(\lambda)\geq 1$, $L_D(\overline{\lambda})\leq L_H(\pi_h)$ and $\widetilde{\pi}_h(\pi)<\infty$ always exists. ■

Proof of Proposition 5. Under *discretion* losses are $L_D(\pi,\kappa)=\left[E(\lambda)m_{1,d}+m_{2,d}\right](1-\kappa)$. Under *codification* losses are $L_C(\pi,\kappa)=\left[E(\lambda)m_{1,h}\ +m_{2,h}\right](1-\kappa)$ if $\pi<\pi^{\widetilde{a}}$ and $L_C(\pi_h,\kappa)=\left[E(\lambda)m_{1,h}+m_{2,h}\right](1-\kappa)-(\overline{\lambda}-1/\overline{\lambda})^{-1}\int_{\widetilde{\lambda}(\pi_h,\kappa)}^{\overline{\lambda}}\left[(\lambda m_{1,h}+m_{2,h})(1-\kappa)-\lambda m_{1,h}/2+(1+m_{2,h})/2\right]d\lambda$ if $\pi\geq\pi^{\widetilde{a}}$ and $1+\kappa'>2\kappa$. $L_D(\pi,\kappa)$ increases in π, decreases in κ; $L_C(\pi_h,\kappa)$ increases in π_h, decreases in κ. *i)* $\pi<1+2/\pi_h$ *discretion* is better *iff* $\left[E(\lambda)m_{1,d}+m_{2,d}\right]<\left[E(\lambda)m_{1,h}+m_{2,h}\right]$ (i.e.

if it enforces $\widetilde{c}$ better), which is true *iff* $\pi \leq \widehat{\pi}(\pi_h)$. $\widehat{\pi}(\pi_h)$ is a suitably defined threshold. *ii)* $\pi > 1 + 2/\pi_h$ and $1 + \kappa' > 2\kappa$; the integral in $L_h(\pi_h, \kappa)$ is positive. Thus, even if *discretion* better enforces $\widetilde{c}$, *codification* may be efficient (i.e. $L_d(\pi, \kappa) > L_h(\pi_h, \kappa)$). There is a $\widehat{\pi}(\pi_h, \kappa)$ such that *discretion* is better iff $\pi \leq \widehat{\pi}(\pi_h, \kappa)$. For $\kappa = \kappa' = 0$, Proposition 5 holds. ■

Proof of Corollary 1. If $\pi > 1+2/\pi_h$ and $1+\kappa' > 2\kappa$, $\widehat{\pi}(\pi_h, \kappa)$ solves $L_D(\widehat{\pi}(\pi_h, \kappa)) - L_C(\pi_h) = 0$; $\partial\widehat{\pi}(\pi_h, \kappa)/\partial\kappa = \widehat{\pi}_\kappa = (L_{h,\kappa} - L_{d,\kappa})/L_{d,\pi}$, where $L_{d,\pi} > 0$, $L_{h,\kappa} = -[E(\lambda)m_{1,h} + m_{2,h}] + (\overline{\lambda} - 1/\overline{\lambda})^{-1}$ $\int_{\widetilde{\lambda}(\pi_h,\kappa)}^{\overline{\lambda}} (\lambda m_{1,h} + m_{2,h}) d\lambda$, $L_{d,\kappa} = -[E(\lambda)m_{1,d} + m_{2,d}]$. Hence, $\widehat{\pi}_\kappa \geq 0$. ■

Proof of Proposition 6. In *iv)*, the threat of foreclosure is unhelpful, as it induces B to repay at most $b < 2K$ in ω_1, which is not sufficient to finance K upfront. The parties here write contracts whereby judges verify cash flows and then mandate either repayment or liquidation. Under $\widetilde{a}$, the project is liquidated in ω_2, A recoups $(1.5)K$ and lends it to B, whose welfare is $(y - K)/2$. $\widetilde{b}$ is never used because it does not allow A to recoup K. Under $\widetilde{c}$, A recoups $(1 + (m_2/2) - m_1)K$ and welfare is $(y + b)/2 - K - m_2(b - K)/2$ if the project is financed. Thus, if $(1 + (m_2/2) - m_1)K$, $\widetilde{c}$ is better than $\widetilde{a}$. In another version (which I will consider henceforth), $\widetilde{c}$ facilitates break even by setting repayment y in ω_1 and 0 in ω_2. Now A breaks even iff $(1/2)[(1 - m_1)y + m_2 K] \geq K$. 1. *Discretion*: since $m_1 = m_2$, parties use $\widetilde{c}$ iff $m_2 \leq (y - 2K)/(y - K)$. Thus, $\widetilde{c}$ is used less often as π increases**,** and welfare falls as a result. If $\pi \to \infty$, and $\kappa = 0$, $\widetilde{c}$ is used if $y > 3K$ (provided $y/2 + b/4 \geq 3K/4$. 2. *Codification*: the *pro-B* code has $m_1 \geq m_2$ and $\widetilde{c}$ is feasible iff $(1 - m_1)/(2 - m_2) \geq K/y$. $\widetilde{c}$ is less feasible if π_h increases because m_1 goes up and m_2 goes down. If $\pi_h \to \infty$, $\widetilde{c}$ is infeasible. If $\widetilde{c}_n$ is infeasible, the parties choose $\widetilde{a}$. 3. *Comparison*: as π rises relative to π_h, the relative performance of *discretion* falls. If $\pi = \pi_h = \infty$ and $\kappa = 0$, under *discretion* $\widetilde{c}$ is used if $y > 3K$, under codification only $\widetilde{a}$ is used and welfare is larger under *discretion.* If judges become more competent under *discretion*, over-liquidation is reduced, more projects are financed and the benefit of *discretion* increases. Under interpretation**,** the results change very little. ■

References

Aghion, Philippe and Patrick Bolton, 1992, "An Incomplete Contracts Approach to Financial Contracting". *Review of Economic Studies* 52, 473-494.

Anderlini, Luca, Leonardo Felli, and Andrew Postlewaite, 2003, "Courts of Law and Unforeseen Contingencies", mimeo.

Ayres, Ian and Robert Gertner, 1989, "Filling gaps in incomplete contracts: an economic theory of default rules". *Yale Law Journal* 99, 87-130.

Beiser, Edward N., and Jonathan J. Silberman. 1971. "The Political Party Variable: Workmen's Compensation Cases in the New York Court of Appeals." *Polity 3*:521.

Bergman, Nittai, Daniel Nikolaievsky, 2003, "Investor Protection and the Coasian View", mimeo.

Bernstein, Lisa, 2001, "Private Commercial Arbitration Law in the Cotton Industry: Creating Cooperation Through Rules, Norms, and Institutions," *Michigan Law Review*, 99.

Black, Bernard, 2001, "The Legal and Institutional Preconditions for Strong Securities Markets", *UCLA Law Review* 48, 781-855.

Bond, Philip, 2004, "Contracting in the Presence of Judicial Agency", mimeo.

Cardozo, Benjamin, 1921,*The Nature of the Judicial Process*, Yale University Press.

Chesler, Robert D., Michael Rodburg, Cornelius C. Smith Jr., 1986, "Patterns of Judicial Interpretation of Insurance Coverage for Hazardous Waste Site Liability", *Rutgers Law Journal* 18, 1-72.

Coase, Ronald, 1960, "The Problem of Social Cost", *Journal of Law and Economics* 3, 1-44.

Coffee, John C., 1999, "Privatization and Corporate Governance: the Lessons from Securities Markets Failure", Working Paper No. 179, *Columbia Law School*.

Damaska, Mirjan, 1986, *The Faces of Justice and State Authority*, Yale University Press.

Djankov, Simeon, Edward Glaeser, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2003, "The New Comparative Economics", *Journal of Comparative Economics*, December.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2005, "The Law and Economics of Self-Dealing", mimeo.

Easterbrook, Frank and Daniel Fischel, 1991, *The Economic Structure of Corporate Law*, Cambridge, MA: Harvard University Press.

Enriques, Luca, 2002, "Do Corporate Law Judges Matter? Some Evidence from Milan", *European Business Organization Law Review*, 3:765-821.

Frank, Jerome, 1949, *Courts on Trial*, Princeton University Press.

Glaeser, Edward and Andrei Shleifer, 2002, "Legal Origins", *Quarterly Journal of Economics* 117, 1193-1230.

Glaeser, Edward, Rafael La Porta, Florencio Lopez-de-Silanes and Andrei Shleifer, 2004, "Do Institutions Cause Growth?", *Journal of Economic Growth*, September.

Hart, Oliver, 1995, *Firms Contracts and Financial Structure*, Oxford University Press.

Hayek, Friedrich,1960, *The Constitution of Liberty*, The University of Chicago Press.

Holmes, Oliver Wendell, 1897, "The Path of the Law", *Harvard Law Review* 10, 457-478.

Kaplan, Steven N., Frederic Martel, Per Stromberg, 2003, "How Do Legal Differences and Learning Affect Financial Contracts?", mimeo.

Kittner, Michael and Thomas Kohler, 2000, "Conditioning Expectations: The Protection of the Employment Bond in German and American Law", *Comparative Labor Law & Policy Journal* 21.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 1998, "Law and Finance", *Journal of Political Economy* 106, 1113-1155.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer, and Robert Vishny, 2002, "Investor Protection and Corporate Valuation", *Journal of Finance* 57, 1147-1170.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2003, "What Works in Securities Laws?", *Journal of Finance*, forthcoming.

Lerner, Josh and Antoinette Schoar, 2005, "Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity", *Quarterly Journal of Economics*, forthcoming.

Levine, Ross, 2004, "Law, Endowments and Property Rights", *Journal of Economic Perspectives*, forthcoming.

Morrison, Edward R., 2003, "Bankruptcy Decision Making: An Empirical Study of Small Business Bankruptcies", mimeo.

Maskin, E. and J. Tirole, 1999, "Unforeseen Contingencies and Incomplete Contracts", *Review of Economic Studies* 66, 83-114.

Pinello, Daniel, 1999, "Linking Party to Judicial Ideology in American Courts: A Meta-Analysis", *The Justice System Journal* 3, 219-254.

Posner, Eric, 1998, "The Parole Evidence Rule, the Plain Meaning Rule, and the Principles of Contractual Interpretation", *University of Pennsylvania Law Review* 146, 533-577.

Posner, Richard, 1992, *Economic Analysis of Law*, Little Brown.

Posner, Richard, 2004a, "Judicial Behavior and Performance: an Economic Approach", mimeo.

Posner, Richard, 2004b, "The Law and Economics of Contract Interpretation", mimeo.

Qian, Jun and Philip E. Strahan 2004, "How law and institutions shape financial contracts: the case of bank loans", mimeo.

Rajan, Raghuram and Luigi Zingales, 2003, "The Great Reversals: The Politics of Financial Development in the 20th Century", *Journal of Financial Economics*, Vol. 69 Issue 1, 5-50.

Rubin, Paul, 1993, *Tort Reform by Contract*, The AEI Press.

Schwartz, Alan, 1988, "Proposals for Products Liability Reform: A Theoretical Synthesis", *Yale*

Law Review 97, 353-419.

Schwartz, Alan, 1992, "Relational Contracts in the Courts: an Analysis of Incomplete Agreements and Judicial Strategies", *Journal of Legal Studies* 21, 271-303.

Schwartz, Alan, and Joel Watson, 2003, "The Law and Economics of Costly Contracting", mimeo.

Shavell, Steven, 1995, "Alternative Dispute Resolution: An Economic Analysis", *Journal of Legal Studies*, XXIV, 1-28.

Shavell, Steven, 2003, "On the Writing and Interpretation of Contracts", mimeo.

Shavell, Steven, 2005, "Optimal Discretion in the Application of Rules", mimeo.

Stone, Julius, 1985, *Precedent and the Law: Dynamics of Common Law Growth*, Sydney: Butterworths.

Townsend, Robert, 1979, "Optimal Contracts and Competitive Markets with Costly State Verification", *Journal of Economic Theory* 21, 265-293.

Viscusi, W. Kip, 1991, *Reforming Products Liability*, Harvard University Press.

Von Mehren, Arthur, T., 1957, *The Civil Law System*, Englewood Cliffs: Prentice Hall.