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Codification, Access to Justice and Contractual Innovation

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Abstract

We study the effect of codification of specific contracts on subversion of justice. Contracting on novel transactions face uncertain enforcement because of limited development of judicial expertise. This may allow stronger parties to distort enforcement by investing more in legal argumentation. As a consequence, only equal parties may choose to contract. If inequality is large, introducing standardized template contracts which limit admissible evidence reduces distortions in adjudication. This expands the scale of contracting, but reduce its scope as agents use templates rather than contingent contracts. This eliminates judicial learning and the accumulation of precedents which over time enables parties to write efficient contingent contracts. Standardization may thus arise when trade opportunities among more unequal parties expand, e.g. in international trade.

We discuss how historical codifications of specific commercial contracts limited judicial discretion in adjudication, e.g by limiting penalties and remedy actions to increase predictability of enforcement. Standardization has been critical for negotiable contracts, whose liquidity depend on an unconditional transfer among investors independently of relative wealth.

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Introduction

Recent research has revived a classic view that common law offers better support for private contracting (for a survey, see LaPorta et al, 2008). Possible causes are that greater judicial independence constrains state interference and regulation, or that it sustains more legal adaptability.[1] Empirical evidence for adaptability is offered in Beck and Levine (2005). However, the mechanism on how legal structure affect individual contracting choices is unclear. This paper seeks to understand the effect of contract codification, which varies vastly across legal systems, ranging from general codification of all contracts under civil law to codes regulating specific contracts in common law. To understand legal innovation in response to new private needs, we study optimal contractual choices and the resulting effect on the path of legal development with and without codification.

Novel transactions are associated with underdeveloped jurisprudence. We show first how the limited ability of judges to interpret contingencies causes not just uncertainty in enforcement, but also an advantage in the litigation process by the party with more resources. A distorted adjudication undermines incentives to contract, and all the more so among more unequal parties. A main result is that the risk of subversion of justice[2] may be ameliorated by a legislative act which standardize the enforcement of predetermined contract forms, or templates. Legislation is necessary because private agents cannot contractually limit a judge's power to admit evidence and legal arguments in litigation. Our second result is that the static benefits gained by introducing standardized contracts is associated to dynamic losses due to a slower accumulation of precedents over time.

Our setting describes best the process of codification of specific commercial contracts in a context of common law (here intended as complete contracting freedom next to the template form). The legislation of template contracts introduces strict instructions to judges on their interpretation, a procedural change which private parties could not implement on their own. A template thus predefines what evidence may be admissible for adjudication, and thus limits the ability of strong parties to prevail unfairly in contractual disputes. This improves incentives to trade among

[1] North and Weingast (1986) offer an historical perspective on the need of limited government for contractual reliability.

[2] By subversion of justice we intend the ability of a party with more resources to distort the judicial decision in a contractual dispute by collecting more pieces of evidence.

agents with unequal resources, and expands the range of individuals who use formal contracts.

As template contracts predefine what contingencies will be enforced, they are too simple, representing a safe but not an optimal contracting solution. A frequent use of templates also reduces adjudication of novel contingencies. This hampers judicial learning on the interpretation of evidence, as judges do not establish precedents.[3] This is consistent with the observation that much legal training focuses on precedents and jurisprudence (e.g. Von Mehren 1957). Precedents ensure predictability of enforcement, by clarifying judicial interpretation of evidence. Equal parties, which do not face distorted adjudication, prefer more contingent contracts, as they produce better incentives. In fact, we show that the range of agents preferring nonstandard contracts increases with precedent accumulation.

Since the expansion in contracting is greater, the larger is the inequality of resources among trading partners, we should expect codification to arise when opportunities for trade expand among more unequal parties, and to produce increased contracting among agents who did not previously choose to trade with each other. As an illustration, we point out that British commercial codification in the XIX century took place at a time of booming trade opportunities among very diverse parties, driven in particular by cheaper transport between Europe and its colonies.

A good illustration of codification of contracts is the British Bill of Exchange Act of 1882. Tradable contracts are particularly sensitive to uncertainty in enforcement, as their value depends on liquidity of trading among diverse agents. Legal objections to any individual transfer could invalidate the claim held by the investor. The 1882 codification excluded such legal recourse, resulting in much greater reliability of enforcement. Progressive standardization of negotiable contracts and company obligations was a critical step for the diffusion of financial contracting. However, contract standardization is often achieved by private initiatives with enforcement capacity. For instance, privately owned stock exchanges established listings requirements for associated firms, under threat of expulsion.[4]

Our results do not depend on assuming efficiency in judicial decisions, as in Rubin (1977). A precedent ruling may interpret incorrectly the evidence, while a

[3] Hadfield (2006) models the need for incentives in the accumulation of legal human capital able to interpret precedents so as to ensure efficient legal evolution.
[4] Interestingly, in many countries stock exchanges were created as local monopolies.

template may be designed around optimally chosen contingencies.[5] Yet even if judges does not create precedents based on the right inference, they do learn to recognize new evidence. This expands the range of enforceable contingencies, enabling the parties to contract on appropriate outcomes. Thus precedent creation reduces legal uncertainty in contingent contracting, over time reducing the distortion in adjudication. So judicial discretion ultimately support better adaptation to new private needs. Even if agents can combine template contracts with precedents to increase the spanning of contingencies and thus incentives, templates still reduce the frequency of contingent contracting and thus the speed of resolution of legal uncertainty.[6] Thus codification trades off a static efficiency gain against a dynamic loss of adaptability. This is consistent with the evidence on greater complexity of venture capital contracts in common law countries (Lerner and Schoar, 2005).

Our model has other precise implications, although hard to test. Standardization of template contracts should expand trading among agents who had previously not contracted, in particular among agents who are more diverse or did not know each other. A classic anecdotal example is the development of leasing contracts across civil and common law contracts. Leasing is a novel contract, and challenges civil law templates as it combines features of a sale and a rental contract (it is in fact a lease with an option to buy at expiration). While leasing spread rapidly in common law countries, elsewhere its diffusion was slower, and in some cases equired national codification to take off.

Other authors have analyzed formally the problem of judicial error and its impact on legal evolution. Gennaioli and Shleifer (2006) study distorted precedents from biased judges. Gennaioli (2007) and Gennaioli and Shleifer (2008) study how judicial bias shapes enforcing contracts and legal rules. Glaeser and Shleifer (2003) and Bond (2004) focus on corruption among law enforcers in a static setting.

Our result is related to the analysis by Daugherty and Reinganum (2000) and Glaeser and Shleifer (2003), who conclude that inequality in the parties' ability to present evidence in court results in a distortion of justice in tort litigation. Tort

[5] Also, as this signal is on average more likely to be supplied by a stronger party, the precedent will be less informative than the average undistorted signal.

[6] Legal scholars have developed related perspectives on the question of how judicial uncertainty affects litigation and efficiency. Ehrlich and Posner (1974) compared rules vs. standards, on when should the law be clarified. Pistor and Xu (2003) have analyzed who should clarify the law when it is incomplete. White (1992) and Kaplow (1996) questioned who benefits from the ambiguity caused by the complexity of the law.

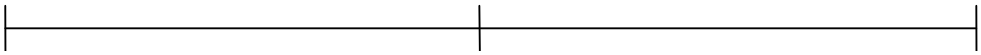
liability and claims are involuntary, although they are affected by ex ante care choices. A distinct contribution of our model is its analysis of how inequality affects ex ante contracting. As Glaser, Schankerman and Shleifer (2003) argue, inequality distorts markets as well as legal enforcement and regulation. Since unfair outcomes distort economic incentives, regulatory solutions which may appear rigid may be necessary to limit ex post manipulation (Glaeser and Shleifer, 2001).

Our interpretation of the role of codes on restricting admissible evidence is consistent with the use in many civil law systems of inquisitive judges with direct responsibility to collect evidence. Were such judges unbiased, they could avoid the effect of inequality on private enforcement. On the other hand, inquisitory judges may well be compared to regulators, and the evidence suggests that the risk of regulatory capture is significant for sectors which depend very much on contracting, such as finance (Rajan and Zingales, 2003; Barth, Caprio and Levine, 2006). Much is at stake in this discussion. The question of legal development is critical for developing countries, where enhancing the efficiency of the legal system is a pressing problem.

The paper is organized as follows. Section 1 presents the contracting inefficiency arising from unequal resources during dispute resolution. Section 2 and 3 solve for optimal contracting in the static and the dynamic model. Section 4 presents the static benefit of introducing template contracts with predefined admissible evidence, and illustrates its negative dynamic effects. Section 5 presents an extension on the explicit decision on acquiring evidence. Section 6 reviews two major episodes of codification, the French and the Indian codes, in the light of our hypothesis.

1. The Basic Model

Buyer *B* and seller *S* contract over a novel transaction, on which no history of legal decisions exists. Let this be over the supply of a tailored widget. The widget's value is 0 on the market but *v* for the buyer, where *v* is uniformly distributed in $[0,1]$ (*v* may represent the widget's quality). Production unfolds in three dates. At $t = 0$, *S* must undertake an unobservable investment in knowledge/skills at a cost *c>0*, which enables *S* to produce the widget for *B*. At $t = 1$, *B*'s value of the widget is realized and observed by *B* and *S*. At this point, *S* must exert effort to produce. An amount $e \in [0,1]$ of effort costs $e^2/2$ to *S*. At $t = 2$, a widget is produced with probability e. Figure 1 below shows the timing:



$t = 0$: *S* decides to invest at cost *c*

$t = 1$: *v* is realized, *S* exerts effort *e* at cost $e^2/2$

$t = 2$: with prob. *e* widget is produced. *B* and *S* exchange it.

Figure 1.

1.1 The First Best Contract

If *S* invested in knowledge/skill at t = 0 then, since at t = 1 the value of the widget to *B* is known, the first best effort level *e(v)* solves:

$$\max_{e(v)} ev - (1/2)e^2 \qquad (1)$$

for every *v*. First best effort at t=1 is equal to $e_{fb}(v) = v$ and social welfare (gross of the t=0 investment cost *c*) is equal to:

$$\int_0^1 \left[e(v)v - (1/2)e(v)^2\right]dv = 1/6 \qquad (2)$$

We focus on cases where in the first best the widget should be produced by assuming:

A.1.: c < 1/6

This assumption implies that in the first best the seller invests at t = 0 and at t=1 exerts effort commensurate to the value of the output $e_{fb}(v) = v$. Effort is unobservable, so B must provide S with incentives to exert effort by using a long term contract fixing the price of the widget in advance. We assume throughout that the parties can renegotiate the initial contract ex-post and that *B* has all the bargaining

power.[7] In the absence of an ex-ante contract, as the widget's market value is zero, *B* can capture all the value created by *S*, eliminating the incentive to invest, and the widget is never produced.[8] In this world, if v is verifiable by courts, the first best is attained under a contract whereby *B* commits to buy the widget from *S* at price $p(v) = v$. Under this contract, S chooses e to solve:

$$\max_{e(v)} ep(v) - (1/2)e^2 \tag{3}$$

Thus, S sets the first best level of effort $e_{fb}(v) = v$. Because S obtains all the social surplus of 1/6, he also invests ex-ante.[9]

In reality, courts cannot perfectly verify v, so this contract will not be efficient. For example, if *S* expects courts to find $\hat{v} > v$, he exerts too much effort, and vice versa if $\hat{v} < v$. In line with court practices and with Hart and Moore (1986), we assume that contracting is at will, namely that courts cannot force the parties to trade. We now propose a model of judicial state verification to study the static and dynamic causes of courts' ability to verify v.

[7] Our result obtains under milder assumptions on B´s bargaining power.
[8] Under specific performance, the first best is attained by using option-like contracts (e.g. Noldeke and Schmidt 1995). In reality, imperfect courts are likely to undermine also specific performance. To focus on the difficulty of establishing facts, we assume that specific performance is not enforced.
[9] Notice that ex-ante surplus can be suitably shared among the parties with an ex-ante wealth transfers.

1.2 State Verification

We study a "complex" transaction where the proper verification of *v* requires judges to consider a measure 1 of *verifiable* signals s_i, $i \in [0,1]$, each describing some contingency with index *i*. As the average value of all contingencies fully describe the state of the world *v*, to properly verify *v* a judge must evaluate all signals. Each signal s_i takes value on $\{0,1\}$. For every *v*, a share v of signals takes value 1, a share $(1-v)$ takes value 0. Thus, different pieces of evidence may conflict, but on average the average of all signals yield a perfect estimate of *v*. We index signals so that for any *v*, a lower indexed signal is more likely to take value 0 than 1. In particular, all signals s_i with $i \leq 1-v$ are equal to 0, signals s_i with $i > 1-v$ are equal to 1. Figure 2 below represents the configuration of signals for a given state *v*:

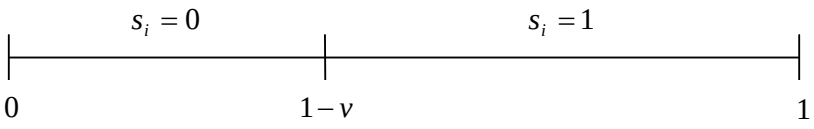


Figure 2.

For every value *v*, define the discriminating signal as $i(v) \equiv \{i^* : s_i = 0 \Leftrightarrow i \leq i^*\}$. If judges could consider all the available signals, *v* could be perfectly verified and the first best would be attained under either of the following contracts:

$$p = \int_{i \in [0,1]} s_i \, di \tag{4}$$

or:

$$p = 1 - i(v) \tag{5}$$

Contracts (4) and (5) highlight the conditions under which perfect verifiability is attained in our model. For contract (4) to work, judges must be able to consider all signals. For contract (5) to work, judges should understand the index (or informativeness) of all signals, and thus be able to recognize *i(v)*.[10]

In practice, both conditions are unlikely to hold in complex transactions where many aspects are material to determining the underlying state of nature. On the one hand, it is likely to be too costly for the parties to collect all available evidence. On the other hand, courts are likely to have limited expertise and are thus unable to

[10] Even if the judge does not know the entire range of indices, if ex post he is able to identify them in an interval of [0, 1] which includes *i(v)*, he could identify *i(v)* and enforce the contract.

recognize the informativeness (i.e. the index *i*) of the signals presented to them. In the next section, we present a model of adjudication based on these two considerations.

1.3. Litigation and Adjudication

Our model of adjudication relies on three assumptions. First, in any contractual dispute judges cannot interpret more than one novel signal. Second, judges can recognize proper signals but cannot identify the specific contingency to which each signal refers. As a result, for judges all signals are equivalent, as they cannot recognize their informativeness (measured by their index *i*). Limited judicial understanding of novel contingencies undermines both contract (4), which requires courts to average all signals, and contract (5), which requires courts to recognize which signal is most informative in every state *v*. [11] While these assumptions suggest an extreme form of judicial incompetence, they highlight the role of enforcement uncertainty on contracting. Later in the model we allow judges to progressively learn about the contingencies of the transaction.

Third, we assume that parties have limited and unequal ability to collect evidence to present it in court. Thus, it is too costly for the parties to collect all the signals, and one party (e.g. the seller) may be richer and thus better able to gather evidence than the counterparty. Formally, we assume that, in any state *v* each party can collect at most a fraction $x_j < 1$ of all signals favourable to him, where *j*=*B*,*S*. As a result, in any state *v* the seller can collect a number $x_S v$ of signals taking value 1 (i.e. those favourable to the seller), while the buyer can collect a number $x_B(1-v)$ of signals taking value 0 (i.e. those favourable to the buyer). Notice that if $x_S > x_B$, the seller is stronger than the buyer and vice versa. The ratio $\sigma = x_S / x_B$ measures the inequality of weapons between B and S: the larger is σ, the stronger is the seller in litigation, and vice versa for low σ. The sum $x_S + x_B = x$ measures the total share of signals the parties can gather, and proxies for the complexity of the underlying transaction. Specifically, in more complex transactions it is harder to gather verifiable evidence, so *x* is lower.

We assume that the judge adjudicate a dispute by picking a signal among those presented by the party offering more evidence. One can rationalize this choice

by viewing litigation as a debate and signals as arguments. After the seller has presented a signal taking value 1, the buyer presents a signal taking value 0 as a counterargument. Since the judge cannot rank signals based on their informativeness, these two conflicting signals cancel out. The process is repeated until one signal is not offset, and the party presenting it wins.[12] As a result, the seller wins the trial whenever:

$$x_S v \geq x_B (1-v) \quad \Leftrightarrow \quad v \geq \hat{v} \equiv \frac{1}{1+\sigma} \tag{6}$$

Notice that at the time S chooses effort, he knows *v*, so he will be able to predict the outcome of the dispute.

Two factors shape trial outcomes in this model: the case facts *v* and the Inequality among the parties σ. The true state *v* affects trial outcomes by determining the likelihood that different parties end up with favourable signals. For instance, the seller is more likely to win the higher is *v* because he is more likely to find signals favourable to him. On the other hand, the seller's relative strength σ shapes trial outcomes by determining the ability of the parties to find favourable signals among all the available ones. For example, if σ is high the seller can select a sufficiently large number of positive signals so as to defeat his opponent, even if *v* is relatively low.

The next section looks at the implications of this distortion for contract enforcement and welfare.

2. Optimal Contracting and Inequality

The timing of the model is as follows. At t = 0 the parties decide whether to contract or not. If they do, the contract is enforced by a court at t = 1. Because there are no precedents, judges cannot recognize more than one signal. So the parties can only specify two prices, a baseline payment p and a bonus Δ, where the bonus is paid to the seller if and only if the seller wins, i.e. if the judge picks a signals taking value 1. Notice that as judges are unable to associate signals to contingencies,

[11] Alternatively, as modelled by Gennaioli (2004) enforcement problems may be due to the courts' bias, which induces it to consider the evidence favourable to its preferred party and neglect the rest.
[12] While this formulation yields convenient closed form solutions for the dynamic analysis, it does not derive the parties' litigation strategy from first principles. In an extension we show that the results are very similar when litigants optimize over the number of costly signals to collect.

contingent contracts which specify exactly what signals the parties should present to the court cannot be enforced.[13]

Given a contract (p, Δ), (6) indicates that the buyer wins and the base price p is enforced if $v < \hat{v}$ while the seller wins and the base price plus bonus $p + \Delta$ is enforced if $v \geq \hat{v}$. Under contract (p, Δ), the seller's effort choice is thus equal to:

$$e_{s.b.}(v) = \begin{cases} p & if \quad v \leq \hat{v} \\ p + \Delta & if \quad v > \hat{v} \end{cases} \tag{7}$$

As a result, the optimal ex-ante contract solves:

$$\max_{p,\Delta} \int_0^{\hat{v}} \left[pv - p^2/2 \right] dv + \int_{\hat{v}}^1 \left[(p+\Delta)v - (p+\Delta)^2/2 \right] dv$$

The optimal contract therefore stipulates:

$$p = \hat{v}/2 \quad \Delta = 1/2 \tag{8}$$

The base price depends on σ. If parties are equal (i.e. $\hat{v} = 1/2$), then $p = 1/4$, but as σ increases, p falls. The intuition is that a stronger seller is able to obtain the bonus more often, which may induce him to over-provide effort. To reduce such over-provision p is reduced. Does this contractual adjustment neutralize the impact of σ on welfare? The parties' ex-ante welfare is equal to:

$$W = \frac{1}{6} - c - \frac{(1 - 3\hat{v} + 3\hat{v}^2)}{24}, \tag{9}$$

Where $(1 - 3\hat{v} + 3\hat{v}^2)/24$ measures the welfare loss relative to the first best, which is at $\hat{v} = 1/2$. Hence, greater inequality among the parties $|\sigma - 1|$ reduces welfare. The intuition is that distortions in evidence collection reduces the informativeness of signals, reducing the effectiveness of contracts to provide incentives. If inequality is huge, the optimal contract stipulates a non-contingent price of 1/2.[14] We find:

Proposition 1. If $c \geq 15/96$, then the parties never contract.

If instead $c < 15/96$, there exist two thresholds $\underline{\sigma}$ and $\overline{\sigma}$ with $0 \leq \underline{\sigma} < 1 < \overline{\sigma} = +\infty$, such that the parties contract if and only if $\sigma > \underline{\sigma}$ or $\sigma < \overline{\sigma}$. The welfare of contracting parties monotonically decreases in $|\sigma - 1|$.

[13] The assumption that agents cannot contract on judicial procedures rules out forcing a different number of unspecified signals for the two parties.

As inequality distorts enforcement , the larger it is, the weaker is the seller's incentive to invest and the lower is welfare. The distortion may be so severe to discourage the parties to contract. In general, contracting is more likely to occur among more equal parties.

To see the same effect in the aggregate, suppose that there is a measure one of possible interactions between buyers and sellers, where each interaction is characterized by a certain value of σ. Specifically, suppose that the distribution of σ among possible interactions induces a distribution of $\hat{v}$ in $[0,1]$. By averaging (9) one finds that aggregate social welfare is equal to:

$$\Pr(\hat{v}_0 \in T)\left\{\frac{1}{6} - c - \frac{1 - 3E(\hat{v}_0|\hat{v}_0 \in T)\left[1 - E(\hat{v}_0|\hat{v}_0 \in T)\right] + 3V(\hat{v}_0|\hat{v}_0 \in T)}{24}\right\} \qquad (10)$$

where $T \equiv \left\{\hat{v}_0 \middle| \hat{v}_0 \in \left[\hat{v}_0(\overline{\sigma}), \hat{v}_0(\underline{\sigma})\right]\right\}$ is the set of transactions where inequality is sufficiently small that the parties choose to contract.

Expression (10) shows that a more unequal distribution of power, reflected in a greater proportion of transactions with high or low σ, induces two costs. First, it reduces the share of buyer-seller pairs finding it profitable to contract (i.e. it reduces $\Pr(\hat{v}_0 \in T)$). Second, it distorts investment incentives by reducing the quality of contract enforcement (both via a distorted mean $E(\hat{v}_0|\hat{v}_0 \in T)$ and a higher variance $V(\hat{v}_0|\hat{v}_0 \in T)$.

The current analysis overlooks the possibility that judicial training and the law may develop and adapt over time, reducing the above enforcement risks and thus the detrimental impact of inequality. The next section addresses this issue.

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[14] If the seller is very powerful (i.e. $\sigma \to \infty$) this is attained by setting $p = 0, \Delta = 1/2$, if the buyer is very powerful (i.e. $\sigma \to 0$) by setting $p = 1/2$, as in this case the bonus is never enforced.

3. The Evolution of Precedents and Contracts

The previous analysis thus represents the outcome attained in the first instant of contracting *t=0*. How do precedents accumulate and affect contracting? In this section we look at the consequence of the assumption that judges learn to recognize signals through the accumulation of precedents, so that contracts may be made contingent on them.

Formally, in our approach a precedent consists of a mapping between a signal previously used in adjudication, which judges have learned to recognize, and an index $q \in [0,1]$. In other words, when the judge uses a specific signal to adjudicate a contract, this signal becomes part of legal knowledge and receives some interpretation. In future enforcement rounds, *all* judges are able to recognize each already examined signal as a precedent and attribute index *q* to it.

Let time be continuous. At each instant $t \geq 0$, buyer-seller pairs meet, contract and litigate, and the new signals used by courts across all litigations create a flow of new precedents. Thus, for any $t > 0$ the stock of precedents accumulated by the legal system is a key state variable.

3.1 Precedents and Contracts After the First Litigation Round

We consider first the flow of precedents created during the first round of litigation. For simplicity, we assume that buyers seeking favourable evidence collect sequentially signals with the lowest index, while sellers those with the highest index. This is optimal because low and high index signals are those more likely to take values 0 and 1, respectively. Assuming that the inequality of matched buyers and sellers have a continuous distribution, we can predict what range of signals will be presented to judges as follows:

Proposition 2: The first litigation round creates a flow of precedents consisting of all signals $i \leq x/(1+\underline{\sigma})$ and $i \geq 1 - x\overline{\sigma}/(1+\overline{\sigma})$. Judges attribute to each of those signals an index *q* which becomes known. This index may be different from the signal's true index *i*.

Proof: see the appendix.

This result yields two crucial messages. First, judges are uninformed and choose randomly the signal upon which to adjudicate from those supplied by the parties. Second, while they can verify the signal's value, they do not know how to assign to this signal its proper relevance. They may thus erroneously treat a nearly uninformative piece of evidence (such as one with index close to 1 or close to 0) as highly relevant, attributing to the signal an incorrect index *q*. Under this assumption, any benefit of precedent accumulation does not mechanically rely on judges taking efficient decisions, and judicial mistakes will persist into case law.

Second, more precedents are created if more buyer-sellers pairs contract with each other, as adjudication is a necessary prerequisite for precedent creation.[15] Moreover, precedent accumulation is maximized when contracting takes place among very unequal parties. For any given σ, the number of collected signals is larger for the party favoured by the case facts (the buyer for $v < 1/2$, the seller for $v > 1/2$). Thus, the number of signals collected and the creation of precedents is maximized if the party favoured by the case facts is relatively strong, i.e. if inequality is large.[16]

Notice that if parties can collect all signals (i.e. if x equals one), the first round of precedent accumulation might fill the entire measure of signals. This is very unrealistic, so we focus on the more interesting case when transactions are sufficiently complex, namely:

A.2: $x_j < 1/2$ for $j = B,S$.

After the first round of precedent accumulation, the space of signals takes the form:

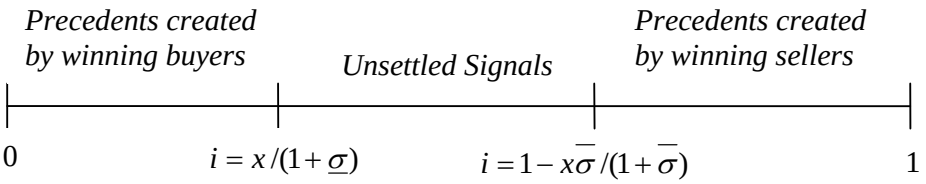

Figure 3.

[15] Law and economic scholars (e.g. Posner 1972) stressed that the accumulation of precedents may be slowed down by the parties' decision to settle rather than to litigate, a possibility we ignore.

[16] To see this in detail, notice that signals taking value zero are mostly presented by strong sellers (i.e. $\sigma = +\infty$) when *v* is high, signals taking value 1 are mostly presented by strong buyers (i.e. $\sigma = 0$) when *v* is low. Indeed, suppose that $v = 0$. If in this case $\sigma = 0$, the buyer collects and presents *x* signals taking value zero. Across the multitude of similar disputes, each of these *x* signals is recorded into precedents. If instead $\sigma = 1$, both the buyer and the seller collect *x*/2 signals but only the former shows them to the judge, leading to only *x*/2 precedents being created. Section 5 shows that this result generalizes to the case where parties bear an explicit cost of discovering new signals.

The indexes indicated in Figure 3 are the true signals' indexes, not those attributed to them by judges. How can contracting parties use such signals ?

Suppose for a moment that judges could recognize these signals and attribute them to their own index. This would allow the parties to write more complete contingent contracts. Indeed, if $i(v) \in \left[x/(1+\underline{\sigma}), 1-x\overline{\sigma}/(1+\overline{\sigma})\right]$ (where $i(v)$ is the "critical signal" defined in Section 2), the contract $p = 1-i(v)$ described in expression (5) implements the first best, since the weak party can collect the signal $i(v)$.[17] So accumulation of precedents allows the parties to attain the first best irrespective of σ, for every $v > \underline{v} \equiv x\overline{\sigma}/(1+\overline{\sigma})$ and $v < \overline{v} \equiv 1-x/(1+\underline{\sigma})$, which is precisely where $i(v) \in \left[x/(1+\underline{\sigma}), 1-x\overline{\sigma}/(1+\overline{\sigma})\right]$.

However, in our setting the index *q* attributed to signals in the precedents does not coincide with the signals' true index *i*. How can contracting parties manage this mismatch ? The key issue is the possibility for the parties to contract on precedents. Let $q(i): \left[0, x/(1+\underline{\sigma})\right) \cup \left(1-x\overline{\sigma}/(1+\overline{\sigma}), 1\right] \to [0,1]$ be the mapping established by judges linking true indexes with assigned indexes. The parties need to include in the contract the mapping $i = q^{-1}(q)$, using it to associate the price *p* to the correct interpretation of the index of precedents. Ex post, the parties can have the first best contract $p(v) = 1-i(v)$ perfectly enforced for all cases when $v \notin \left[\underline{v}, \overline{v}\right]$. Such contracting scheme effectively implements the first best by correctly pricing the realization of each signal, irrespective of its attributed rank *q*. In this interpretation, the key role of precedents in contractual transactions is to allow judges to recognize more signals and thus to foster predictability. Even if the judicial interpretation is incorrect, the parties can contract around this distortion as they see fit.

Thus, after the first round of litigation the ability of strong parties to distort adjudication is restricted to the set of unsettled signals $i \in \left[x/(1+\underline{\sigma}), 1-x\overline{\sigma}/(1+\overline{\sigma})\right]$, which is to say to $v \in \left[\underline{v}, \overline{v}\right]$. As a result, the optimal ex-ante contract looks like:

$$\begin{array}{l} i = q^{-1}(q) \\ p(v) = 1-i(v) \quad for \quad i(v) \in \left[0, x/(1+\underline{\sigma})\right) \cup \left(1-x\overline{\sigma}/(1+\overline{\sigma}), 1\right] \\ (p, \Delta) \qquad\quad for \quad i(v) \notin \left[0, x/(1+\underline{\sigma})\right) \cup \left(1-x\overline{\sigma}/(1+\overline{\sigma}), 1\right] \end{array} \qquad (11)$$

[17] Note that since precedents do not span all contracts, whether the critical signal would belong to those recognized by judges is uncertain ex ante before *v* becomes observable.

Where (p,Δ) means that the court should enforce the base price p or $p+\Delta$ depending on the trial outcome, in the spirit of Section 2. In words, by including the mapping from precedents to true signal ranking, the optimal contract reaches the first best in values of *v* "spanned" by existing precedents but it only specifies a base price and a bonus for values of *v* not spanned by existing precedents.

Consistent with Section 2, in $\left[\underline{v},\bar{v}\right]$ the buyer presents $x_B(\bar{v}-v)$ signals taking value 1, the seller $x_S(v-\underline{v})$ signals taking value zero. Thus, *S* wins whenever:

$$v \geq \hat{v}_1 \equiv \frac{\sigma}{1+\sigma}\underline{v} + \frac{1}{1+\sigma}\bar{v} \tag{12}$$

The optimal baseline price *p* and a bonus Δ solving:

$$\max_{p,\Delta} \int_{\underline{v}}^{\hat{v}_1} \left[pv - p^2/2\right]dv + \int_{\hat{v}}^{\bar{v}_1} \left[(p+\Delta)v - (p+\Delta)^2/2\right]dv$$

These are in turn equal to:

$$p = (\underline{v}+\hat{v}_1)/2 \quad \Delta = (\bar{v}-\underline{v})/2 \tag{13}$$

As in Section 2, the optimal base price still falls in σ, but it is now adjusted upward to reflect the fact that it is on average enforced at a higher *v*. Accordingly, there is a positive bonus but its size is smaller than in Section 2 because now the effort gap (and thus the required incentive) is smaller. Recalling that now in $v \notin \left[\underline{v},\bar{v}\right]$ the first best is attained and considering that contract (13) provides incentives in $\left[\underline{v},\bar{v}\right]$, it is easy to find that social ex-ante welfare after some precedents have accumulated is equal to:

$$\frac{1}{6} - c - (\bar{v}-\underline{v})^3 \frac{1-3\hat{v}+3\hat{v}^2}{24} \tag{14}$$

In the absence of precedents (i.e. $\bar{v}-\underline{v}=1$), the expression is identical to previous expression (8). However, precedents improve welfare by allowing the parties to reduce the range over which the strong party distorts enforcement in his favour. If precedents exhaust all signals (i.e. $\bar{v}-\underline{v}=0$), then the parties attain the first best, irrespective of their inequality. To summarize, we find:

Proposition 3. The extent to which contracts are contingent decreases in $\bar{v}-\underline{v}$. The adverse impact of $|\sigma-1|$ on the ex-ante welfare of contracting parties increases in $\bar{v}-\underline{v}$. The thresholds $\underline{\sigma}$ and $\bar{\sigma}$ respectively decrease and increase in $\bar{v}-\underline{v}$.

This Proposition summarizes the main findings of this section. First, precedents creation allows the parties to write more contingent contracts by rendering more signals available for parties to contract. Second, because precedents bind the way judges verify specific signals, they reduce legal uncertainty, hampering the ability of the stronger party to distort contract enforcement and welfare. Third, by improving enforcement, precedent creation allows more buyer-seller pairs to contract.

The evolution of precedents can thus reduce the costs of inequality by increasing predictability and by allowing more contingent contracting. We fully explore this possibility by studying the long run dynamics of legal evolution.

3.2 The Long Run Evolution of Law, Contracts and Welfare

The evolution of precedents, contracts and welfare is shaped by the evolution of $V \equiv (\bar{v} - \underline{v})$. Because V measures the extent of legal uncertainty in $[0,1]$, the development of precedents is measured by 1-V. But 1-V also measures the state of contracting, as it is the measures of signals contracts are contingent on. Thus, given a path $V(t)$ for legal uncertainty, precedents and contracts evolve according to $-\dot{V}$. By the same token, since the parties' welfare is $1/6 - c - L$, where L is the welfare loss relative to the first best, expression (14) yields $\dot{L}/L = 3\dot{V}/V$. But how does V(t) evolve over time? By generalizing Proposition 2 for a generic $t>0$ we find:

Proposition 4 If $c \geq 15/96$ contracting never takes place and $V(t) = 1$ for every t. If instead $c < 15/96$, $V(t)$ follows the differential equation:

$$\dot{V} = \begin{cases} -xV\left[\dfrac{1}{1+\underline{\sigma}(V)} + \dfrac{\bar{\sigma}(V)}{1+\bar{\sigma}(V)}\right] & \text{for} \quad V^3 \geq (1/6) - c \\ -2xV & \text{for} \quad V^3 < (1/6) - c \end{cases} \tag{15}$$

$\underline{\sigma}(V), \bar{\sigma}(V)$ are functions such that the parties do not contract if $\sigma < \underline{\sigma}(V)$ and $\sigma > \bar{\sigma}(V)$. $\underline{\sigma}(V)$ increases, $\bar{\sigma}(V)$ decreases in V and $0 \leq \underline{\sigma}(V) < 1 < \bar{\sigma}(V) = +\infty$.

As long as some contracting takes place, legal uncertainty falls over time due to the accumulation of precedents (i.e. $\dot{V}/V < 0$). This increase in predictability exerts two effects. First, it fosters subsequent contracting, as implied by the slopes of $\underline{\sigma}(V)$ and $\bar{\sigma}(V)$. Second, it renders contracts more contingent and sophisticated over time,

which improves social welfare. Because $\lim_{t\to+\infty} V(t) = 0$, in the limit all the signals are incorporated into precedents, the parties attain the first best by writing highly contingent contracts and wealth inequality no longer matters for welfare.

One key result of Proposition 4 is that the speed at which legal uncertainty falls (i.e. $\dot{V}/V$) increases in the extent to which parties contract and litigate, as captured by the thresholds $\underline{\sigma}(V), \overline{\sigma}(V)$. If more unequal parties contract with each other there will be more disputes (more signals are collected, in the spirit of Proposition 2) and thus more possibilities for the law to evolve.

In sum, accumulation of precedents reduces the ability of the strong party to distort contract enforcement in his favour, eventually leading to full efficiency. Yet, legal evolution may be too slow and the costs of inequality persist for long. To see that, suppose that $c < 1/8$. In such a case [as one can check by setting $\hat{v} = 0$ in expression (14)], all parties always contract (i.e. $\underline{\sigma}(1) = 0, \overline{\sigma}(1) = \infty$). Then, by solving for the path of legal evolution in closed form one finds that the present discounted value of social welfare from a given initial level of *V* is equal to:

$$W(V) = \frac{1}{\rho}\left\{\frac{1}{6} - c - \frac{\rho V^3}{(\rho + 6x)}\frac{1 - 3E(\hat{v}_0)[1 - E(\hat{v}_0)] + 3V(\hat{v}_0)}{24}\right\} \qquad (16)$$

The key difference between this expression and expression (10) of the static model[18] is that now the social loss due to inequality among litigants is multiplied by $\rho/(\rho + 6x) < 1$. Legal evolution softens the adverse impact of inequality on contract enforcement and welfare. This implies:

Corollary 1: The speed at which precedents and contracts evolve increases in *x*. The aggregate social loss induces by inequality falls in *x*.

The complexity of a transaction matters a great deal for the evolution of precedents, contracting and welfare. Simpler transactions (i.e. transactions with larger *x*) have a speedier evolution of precedents and contracts. This result is not trivially due to their being characterized by fewer signals (all transactions here have the same number of signals): the difference between complex and simple transactions in our model is that trials involving the latter are more informative, while trials involving the former are

[18] Of course, one should compare formula (10) evaluated at *V* = 1 with the present value of an infinite stream of formulas (10) all evaluated at $T = [0, +\infty)$, namely at $\Pr(\hat{v}_0 \in T) = 1$.

plagued by noise and distortion of justice. The speedier evolution of simpler transactions also implies that inequality is not so damaging for them, as the resulting losses are only borne for a short period. Overall, this suggests that less equal countries are likely to have a comparative advantage in undertaking simpler transactions. In addition, countries with less developed legal systems are likely to be characterized by lower *x*, slower legal evolution and thus greater costs of inequality.

These results suggest that autonomous legal evolution may prove an ineffective remedy to the costs of inequality. If dispute resolution mechanisms do not work very effectively, precedents as well as judicial expertise are going to evolve very slowly and welfare losses may loom large. In the next section we show that the use of template contracts may be viewed as an optimal response to these problems.

Section 4 Static and Dynamic Effects of Codification

In our model, one way to prevent inequality from undermining contracting and welfare is to directly regulate contract enforcement so as to reduce legal uncertainty. A mechanism to attain this goal is for the legislator to issue a template contract specifying in advance which signals must be included in the contract and instructing courts how to use them. Then, the parties have the option to choose whether to use a template or a non-standard contract like before. From our perspective, contract standardization can be viewed as an effort by the state to provide judges with specific training (and perhaps also ex-post checks on judicial behaviour).[19] Ex-ante training allows all judges to recognize and measure the relevant signals included in the template contract. This reduces the ability of the parties to distort enforcement by collecting irrelevant signals.

We model standardization by assuming that a template contract can only include one signal, at least at $t = 0$, but the nature of our conclusions does not depend on this assumption. Consider the static problem faced by a benevolent legislator

when drafting the template contract. The legislator chooses an index i^*, a baseline price p_{st} and a bonus Δ_{st} (enforced when $s_{i^*}=1$) so as to maximize ex-ante welfare. We then have:

Lemma 2: The optimal template contract sets $i^*=1/2$, $p_{st}=1/4$ and $\Delta_{st}=1/2$. The parties' welfare under this contract is equal to $5/32-c$ irrespective of σ.

Intuitively, the template contract is based on the ex-ante most informative signal $s_{1/2}$, namely on the one indicating whether *v* is larger or smaller than 1/2. This is the best partition of the state space that can be achieved with only one signal. Although it insulates parties from inequality, the template contract does not yield the first best because it bases incentive provision on a noisy signal of *v*. More interestingly, the parties' welfare under the optimal template contract is equal to the welfare attained by equal parties (i.e. at $\sigma=1$) under the non-standard contract considered in Section 2, namely before legal evolution has started at t=0. This immediately implies:

Proposition 5 At t=0, if $c\geq 5/32$, no pairs ever contract. If instead $c<5/32$ all pairs contract. Pairs with $\sigma\neq 1$ use the template contract, pairs with $\sigma=1$ are indifferent between using a template or a non-standard contract. Social welfare is independent of σ.

Contrast this result with the one of Proposition 1, obtained in the absence of a template contract. The template contract maximizes the scope of contracting between buyers and sellers. If a template contract is available then, provided $c<5/32$, every buyer-seller pair wishes to contract irrespective of their inequality. Indeed, by using the template contract all parties attain, irrespective of inequality, the same welfare

[19] As a result, contract standardization requires direct involvement by the state or by a legitimate private body (e.g. an arbitration association, see Bernstein 2001).

level achieved by equal parties. As a result, the ability of standardization to reduce legal uncertainty and thus to insulate contracting from the detrimental impact of inequality boosts contracting and welfare relative to the case where there are no template contracts available.

As shown by Proposition 5, standardization fosters contracting, especially in countries where inequality is large. Unequal parties adopt template contracts while equal parties might adopt non-standard ones. From a static standpoint, the introduction of template contracts improves social welfare. But what are the dynamic effects of standardization, in particular on legal evolution? It is legitimate to ask these questions because, even in the presence of template contracts, precedents can still accumulate through contractual litigation in transactions where the parties used non-template contracts. We study the case where $c < 5/32$, otherwise both template and non-standard contracting collapse. We then find:

Proposition 6. If the template contract is introduced at $t = \bar{t}$ and includes all precedents accumulated until $t = \bar{t}$ (in addition to signal $s_{1/2}$), then legal evolution stops at $V(\bar{t})$.

As a result, a problem with contract standardization is that it may stifle legal and contractual innovation. The intuition is that the accumulation of precedents is not triggered by all contracting pairs, but only by the subset of them using non-standard contracts. Thus, because – once introduced – the template contract is used by all parties (except perhaps by those who happen to be perfectly equal), it kills the accumulation of precedents and contractual innovation.[20,21]

[20] The assumption that the template contract may be extended by incorporating available precedents is made to maintain symmetry with non-standard contracts, which we allow to include a clause using the

This implies that the standardization of certain contract terms is not necessarily beneficial because it might exacerbate the public good aspect of legal evolution. Contracting parties tend to over-use the template contract because they consider its immediate benefit (i.e. higher predictability) but do not take into account the negative externality of their choice on legal evolution and thus on future contracting opportunities.

To see this effect in greater detail, consider the level of expected discounted social welfare attained when the template contract is introduced at $t = \bar{t}$. As in Section 3, we simplify our life by assuming that *c* is sufficiently small that no parties are ever prevented from contracting (i.e. $\underline{\sigma}(1) = 0, \overline{\sigma}(1) = \infty$). As a result, discounted expected social welfare as of t=0 are equal to:

$$\begin{aligned} &\int_0^{\bar{t}} \left[1/6 - c - V(t)^3 E_{\hat{v}}(L_n)\right] e^{-\rho t} + \int_{\bar{t}}^{\infty} \left[1/6 - c - V(\bar{t})^3 L_s\right] e^{-\rho t} = \\ &= \frac{1}{\rho}\left\{\frac{1}{6} - c - \frac{\rho}{(\rho + 6x)} E_{\hat{v}}(L_n)\right\} + \frac{e^{-(6x+\rho)\bar{t}}}{\rho}\left[\frac{\rho}{(\rho + 6x)} E_{\hat{v}}(L_n) - L_s\right] \end{aligned} \tag{17}$$

Where $E_{\hat{v}}(L_n)$ stands for the expected social loss $\left[1 - 3E(\hat{v}_0)\left[1 - E(\hat{v}_0)\right] + 3V(\hat{v}_0)\right]/24$ borne at t=0 under a non standard contract (see expression 10), while L_s stands for the social loss 1/96 borne at t=0 under a template contract. We then have:

Corollary 2. A benevolent social planner chooses $\bar{t} = 0$ for $E_{\hat{v}}(L_n / L_s) > \rho/(\rho + 6x)$ and $\bar{t} = \infty$ otherwise. A higher ρ, *x* and $E(\hat{v})$ render $\bar{t} = 0$ more likely.

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signal $s_{1/2}$. Of course, the distinction between template and non-standard contracts is empirically more problematic in this case.

[21] The suffocating effect of codification holds under specific conditions, when only a measure zero of parties use the non-contract once the template is introduced. However, the idea that contract standardization reduces autonomous legal evolution is more general. In Appendix 2 we show that the same dynamic cost of contract standardization can be obtained if there is a discrete mass of equal parties in the population and/or the template contract is designed so as to include only a subset of existing precedents. Note that in the limit, signal $s_{1/2}$ becomes a precedent in a non-standardized

Thus, a benevolent social planner finds it optimal to introduce a template contract including signal $s_{1/2}$ if and only if social inequality (as measured by $E(\hat{v})$) is large, if society is impatient and/or if the transaction is complex (i.e. *x* is low). By contrast, relatively more equal, patient societies and/or simpler transactions are less likely to be benefited by standardization. For them, the costs stemming from slower legal evolution are too large relative to the static benefit that standardization brings about.[22] As a result, our model predicts that more unequal countries are more likely to witness an effort toward contract standardization. The same is true for more complex transactions. The intuition is that legal evolution in those transactions legal evolution would be too slow relative to what is needed for efficient contracting to take place.

4.2 Welfare Evaluation

The above analysis suggests that template contracts beneficially avoid the adverse impact of inequality on adjudication. As a result, the introduction of template contracts is beneficial from a static standpoint. On the other hand, template contracts slow down legal evolution, potentially undermining welfare with respect to the case where template contracts are not available. The question then arises, is the introduction of template contracts beneficial? We find:

Proposition 7 The introduction of a template contract increases social welfare when inequality is large, namely if and only if $V(\hat{v}_0)$ and/or $\left|E(\hat{v}_0)-1/2\right|$ are sufficiently large.

In the short run, template contracts ensure greater predictability and welfare. In the long run, template contracts may be harmful because they reduce the speed of legal

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system as an outcome of spontaneous litigation, at which point the two system would behave exactly in the same manner.

[22] Notice that a benevolent social planner fully taking into account the dynamic costs of contract standardization might find it optimal to standardize a signal different from $s_{1/2}$ it is beyond the scope of this paper to calculate what such signal would optimally be. More generally, it would still be the case that standardization would reduce legal innovation, although in a expected/discounted sense the possibility of standardization would unambiguously dominate laissez faire, as Corollary 2 illustrates (e.g. notice that one could always standardize signals s_0 or s_1).

evolution and thus the speed at which the first best is attained. This result is a product of a negative externality exerted by parties using template contracts on the use of non-template contracts: parties using template contracts do not internalize in their choice the adverse impact of their choice on future welfare through slower legal evolution.[23] As a result, if inequality in society is large, then the static benefit of template contracting outweighs its dynamic cost. If society is pretty equal, then template contracts are detrimental to welfare because they undermine contractual innovation.

Section 5 Extensions

5.1 Direct Costs of Gathering Signals

We now present some foundations for our previous assumptions on litigation outcomes by studying a model where the parties explicitly choose the optimal number of signals to acquire subject to the cost of doing so. We solve the case where the parties contract over the range $[\underline{v}, \bar{v}] \subseteq [0,1]$ so as to show that this our results naturally extend also to the dynamic model. The buyer and seller's marginal cost of acquiring signals is constant, equal to θ_B and θ_S, respectively. In this model, the relative strength of the seller is measured by $\sigma = \theta_B / \theta_S$. That is, the seller is stronger the smaller is his relative cost of gathering signals. We keep indexing the seller's relative strength by σ, but notice that θ_B / θ_S is conceptually different from the previous parameter x_S / x_B. By the same token, the overall ability of the parties to gather signals is captured by $\theta = \theta_B + \theta_S$.

We assume that the judge randomly chooses one signal among those presented by the parties. This assumption allows us to solve the model in pure strategies. As a we shall see, the analysis of this explicit model yields results that are very similar to those obtained under the reduced form assumptions of Section 3. Consider the enforcement of contract $(p, \Delta p)$. If the buyer presents a measure n_B of signals taking zero value and the seller a measure n_S of signals taking value 1, then the expected price paid to the seller is equal to:

[23] Notice that the same effect would be present if contracting parties were forward looking. The intuition is that each contracting pair only negligibly affects legal evolution.

$$\frac{n_S}{n_S + n_B}\Delta + p \qquad (18)$$

Because the buyer and the seller draw signals randomly, in any given v the seller presents n_S positive signals by spending $\theta_S n_S /(v - \underline{v})$, the buyer presents n_B zero signals by spending $\theta_B n_B /(\bar{v} - v)$. As a result, the equilibrium number of signals solves the problem:

$$\max_{n_S} -\frac{n_S}{n_S + n_B}\Delta - p - \theta_S \frac{n_S}{(v - \underline{v})} \qquad (19)$$

$$\max_{n_B} -\frac{n_S}{n_S + n_B}\Delta - p - \theta_B \frac{n_B}{(\bar{v} - v)} \qquad (20)$$

Each party trades off the benefit of presenting more favourable signals in terms of having a higher probability of winning with the cost of doing so. The first order conditions of the litigation game between *S* and *B* imply that the probability that the bonus is enforced is equal to:

$$\frac{n_S}{n_B + n_S} \equiv \mu(v) = \frac{\sigma(v - \underline{v})}{\sigma(v - \underline{v}) + (\bar{v} - v)} \qquad (21)$$

The right hand side of this expression is identical to what one would obtain by substituting in the left hand side the optimal signal gathering policy obtained in this section with the assumed signal gathering policy of section 3. This is already a direct confirmation of the validity of our earlier simplifications. By taking into account the way expression (21) affects the expected payment to the seller, it is possible to find that at the optimum $p = E(v) - \Delta E[\mu(v)]$ and $\Delta = \frac{\mathrm{cov}[\mu(v), v]}{\mathrm{var}[\mu(v)]}$, where expectations are computed for $v \in [\underline{v}, \bar{v}]$. The seller's optimal effort level is thus equal to:

$$e(v) = E(v) + \frac{\mathrm{cov}[\mu(v), v]}{\mathrm{var}[\mu(v), v]}\{\mu(v) - E[\mu(v)]\} \qquad (22)$$

Which is the approximation of the first best effort level (i.e. $e(v) = v$) when the expected payment must be linear in $\mu(v)$. Expression (22) is complex to handle analytically (hence our shortcut assumption of Section 3), but Figure 4 shows that the main properties resemble those of Section 3:[24]

[INSERT FIGURE 4]

[24] The figure plots the expression (22) against first best effort for a number of values of σ in $[0, +\infty)$.

As a result, inequality of weapons continues to distort the optimal effort level. When inequality is very large (i.e. σ tends to 0 or ∞), the optimal contract avoid subversion of enforcement by setting a flat payment of 1/2. In other words, inequality among litigants undermines the abilities of the parties to write state contingent contracts. One difference between this model and the one used in Section 3 is that now for $\sigma = 1$ the parties attain the first best.

Hence, inequality of weapons undermines welfare, the more so the larger is inequality. This result also confirms the beneficial effect of legal evolution on welfare. As a result, the key properties of the model of Section 3 are confirmed by the current model where litigants' strategies are endogenously derived as an explicit attempt to maximize expected payoffs.

Before concluding this section, we need to check one last point, namely whether the total number of signals presented increases or decreases in inequality, a key property to our results of Proposition W and Z. In the current model, the number of new signals supplied in each period by the population of disputes of type σ is equal to:

$$n_S + n_B = \frac{(1+\sigma)v(1-v)}{\left[\sigma v + (1-v)\right]\theta} \tag{23}$$

Indeed, because judges randomly choose signals, both the signals presented by buyers and those presented by sellers are likely to be used. It is easy to see that the above expression increases in σ for $v > 1/2$ and decreases in σ for $v < 1/2$, suggesting that the total number of signals and thus legal evolution are likely to be maximized when inequality among litigants is large.

Section 6

A Rationale for Historical Codification

Codification may be seen as opportunistic or benevolent political intervention. It may represent a centralizing power grab by the executive which claims for itself the ultimate right to shape the law. In the extreme case of the Justinian code, the Roman emperors systematized a legal power transfer away from republican institutions and the judiciary, which traditionally had been practicing a case law tradition. The French Code Civil systematized civil law while radically centralizing legal rule. In many other civil law countries the codes played a critical role in nation building, eliminating local rules and customs.

Yet codes were enacted in the XIX century across civil and common law countries alike. [25] A more positive view argues that they served to eliminate en mass privileges and servitudes reflecting the traditional power of landowners, and encumbered the active use and transfer of assets necessary for trade and industry (Horwitz, 1977). Codes offered harmonization and standardization of sources, facilitating an understanding of the law to both judges and the public (Diamond, 1968).[26] The British codification of specific commercial contracts the late XIX century is closest in spirit to our model, as it created template contracts which could be voluntarily chosen over general contracting under common law.

We discuss next two important episodes of codification of contract law to assess our conclusion that expanded opportunities for trade and high inequality were likely causes of their enactment. In both cases, the codification was radical in reducing the role of case law in adjudicating disputes.

[25] Interestingly, the name *common law*, traditionally associated with a system dominated by traditional case law, originates from an early standardization of traditional law in England operated by high judges after the major reforms by Henry II (1154-1189), generally described as the birth of common law (Klerman and Mahoney, 2007).

[26] The Prussian codification is also an examples of both centralization and systematization.

The Indian Codification of Contract Law

The English admirers of the Code Civil, including Bentham and Lord Macaulay, believed that systematization produced more fair and reliable contractual enforcement, and that it would encourage trade across the diverse peoples and nations of British colonies. Under their influence, the British empire strictly codified penal and contract law in India in the XIX century to overhaul a chaotic juridical situation. Under the original Law Charters of India, English, Muslim and Hindu residents were to be governed by their own laws in matters of contract. Soon there was broad dissatisfaction with this principle. Traditional laws differed across religions and casts, and had minimal tradition of supporting formal contracting, while common law had a residual role. Contractual litigation was seen as producing arbitrary resolutions, and made contracting very difficult.[27] After a Penal Code based on a draft by Macaulay was enacted, its success led impulse to codify contract law.

The Indian Contract Act and the Evidence Act of 1972 imposed on Indian judges a strict statutory interpretation of contracts which took precedence on other sources of case law, including common, Hindu and Moslem law as well as local traditions. It stipulated general principles to define and resolve contractual conflicts, set explicit rules on supplying evidence to court, and provided templates in the form of "illustrations" to highlight how judicial decisions should be guided. The authors of the India Law Commission admitted that 'we have deemed it expedient to depart…. from English law in several particulars.' A main example was to encourage trade by eliminating excessive litigation arising from diverse sources of law. The Act simplified interpretation on specific issues relative to the more nuanced common law practice, such as in the area of contractual damages for non performance. In England, judges had discretion on determining whether contractual provisions represented damages or penalties, which were enforced differently depending on circumstances. This required more extensive evidence gathering and legal argument.

[27] Macaulay supported his call for codification by quoting an Indian judge on the state of commercial law as 'a mere lottery'.

The Indian Contract Act also significantly simplified the enforcement of property transfers when a buyer in good faith acquired an asset from someone in possession who was not the legitimate owner (a form of *market ouvert*).[28]

Codes drawn from the Indian Contract Act were subsequently introduced in East Africa and other colonies. This was termed by Gutteridge as the golden age of commercial codification, and the British codes became the basis of British colonies and American uniform legislation on these themes until the Llewellyn's Uniform Commercial Code (Diamond, 1968). An important act was the Sales of Goods Act of 1893, which clarified how the issue of the quality of good delivered were to be interpreted in terms of the original intention of the parties, and clearly indicated the rules by which intent was to be ascertained by the judge (Ilbert, 1920).

An interesting clue comes from the observation that codification took place first in the colonies. The Indian Negotiable Instruments Act preceded the equivalent British Bills of Exchange Act (Encyclopedia Britannica, 1911).[29] Arguably, the greater inequality prevailing in India made the adoption of template contracts more urgent there. Certainly, simplifying enforcement may have been desirable also because Indian judges may have had less experience and knowledge of English common law. Yet this explanation is not consistent with the fact that Britain chose to replicate the experience on its own territory. Before this code, English law relative to bills of exchange, promissory notes and cheques was to be found in 17 statutes dealing with specific issues, and about 2600 cases scattered over some 300 volumes of reports. This codification resulted in remarkable simplification of the law and reduction in its ambiguity, and was certainly supportive of the diffusion of financial contracting (Diamond, 1968).

The French Codification

France's pre revolutionary legal system was a regionally segmented mixture of customary case and Roman law, often in ambiguous relation to each other (Dawson,

[28] The codification of Anglo-Hindu law was warmly received in India (Derret, 1968) as a more rational system of law. Even if its adoption was not voluntary in the sense given by Berkowitz, Pistor and (200?), who document how legal transplantation was more successful when chosen by a local government rather than by colonists, the nationalist movement in India never considered overturning it.

[29] Of course, commercial codes in Britain were still subject to common law, and may have admitted a broader variety of sources from case law. Yet this was not a problem as long as contracting took place among less unequal parties.

1968). Voltaire famously observed that a traveler through France would change horses less often than laws. French kings traditionally sold judgeships to the wealthy, and judges unabashedly promoted the interests of the elite (Dawson, 1968, p. 373). Church and nobility privileges and tax exemptions, plus their grip over the judiciary, hindered the economic development of emerging classes, just at the time when expanding commerce increasingly required reliable contract enforcement. This conflict, compounded by a royal bankruptcy, contributed to cause the French Revolution. The radicalized revolutionaries proceeded to centralize control over what they saw as a corrupt judicial adjudication process, and saw the Code Civil as one of their largest legacy. It transformed judges in state employees with narrow mandate in interpreting state law. The Code codified a menu of boilerplate template contracts, which could be adjudicated with little discretion by verifying a pre defined checklists of facts. Restrictions on admissible evidence limited the ability of the contracting party with more resources to appeal to innumerable arguments drawn from many possible sources. In some cases, the code assigned the task of gathering some pre defined evidence to the judge, eliminating any evidence by the parties.[30] This is consistent with the goal to ensure more reliable contracting for agents with fewer resources to litigate, which was important for the newly empowered emerging classes and satisfied the egalitarian principle of the revolutionaries.

The Code Napoleon's suppression of judicial discretion was radical, while subsequent codifications under less extreme political circumstances, such as the German code, chose to maintain a larger role for jurisprudence. Its strict rules for judicial interpretation of evidence for the resolution of contractual disputes is often seen as a set of formalistic rules which abstract from contractual content and intent, and criticized as inefficient. A fair assessment of such choices however requires a clear conceptual framework to see the original intent and the advantages associated with standardized interpretation of template contracts. As Beck and Levine state in their review of legal systems and finance: 'to reduce corruption and enhance the fair application of the law, France adopted both greater procedural formalism and more limited judicial discretion…Napoleon sought a code that was so clear, complete, and coherent that there would be no need for judges to deliberate publicly about which laws, customs, and past experiences apply to new, evolving situations.…this approach

[30] Robespierre even argued that, "the word jurisprudence … must be effaced from our language."

required a high degree of procedural formalism to reduce the discretion of judges in regulating the presentation of evidence, witnesses, arguments, and appeals (Beck and Levine, 2005).

The Bills of Exchange Act of 1882

The Bills of Exchange Act, 1882, "codifies the greater portion of the common law relating to Bills of Exchange, Cheques, and Promissory Notes". Its extensive commentary allows some insight in identifying its effect on the common law contracting rules. In the British version (but not in the Indian one !) the authors went at excruciating pain to restate the supremacy of the common law:

The rules of the common law, including the law merchant, ***save in so far as they are inconsistent with the express provisions of this Act****, shall continue to apply..*
Yet they also cledarly indicated that
where a rule is laid out in express terms (in the Act)… the general (i.e. common law) rule ought not to be applied in ..limiting its effect…

A specific case of conflict mentioned in the commentary to the Act is §29(2), the case when under common law "a signature to a bill obtained by force and fear is valueless even in the hand of an innocent third part". In contrast, the Act establishes that any promissory note comform to the Act held by an acquirer in good faith is always valid independently from any irregularity in intermediate endorsements of the bill. Basically, this ensured entitlement by any holder, independently from the legitimacy of all previous transfers. Note that private parties could not have stipulated by contract that the claim remained valid even if transferred in violation to common law principles. [31]

(Quoted from Dawson, 1968, p. 426)

[31] The British Act also stated that "when a clause introduces a change into the law, the change will not be assumed to go farther than its express term warrants in infringing the rules of the common law... When the Act does not lay down a rule, but implies that if such a rule exists, its application shall be as prescribed in the Act, the common law must be looked to, in order to know what are the circumstances in which it has effect". In other words, the common law remains the residual set of rules excluding those circumstances explicitly stated in the Act.

A major effect of the Act is that it creates a default rule that each bill is negotiable unless explicitly excluded by the text, while before negotiability had to be explicitly included in the text.

Conclusions

Our approach offer some rationalization for why commercial codes tighten procedural rules for the presentation and interpretation of evidence. Standardization of individual contracts, defined as template contracts with predefined admissible evidence, may improve access to justice for contracting agents with unequal resources and avoid subversion of justice.

On the other hand, template contracts are by design too simple to accommodate specific needs of commercial transactions. Their diffusion limits the development of case law and jurisprudence on novel contracts. Precedents serve as privately generated templates on which parties can anchor more contingent transactions, ensuring legal adaptability to current needs.

Our approach is quite distinct from the view that restrictions on contracting freedom or distortion on enforcement may be efficient under asymmetric information (as in Aghion and Hermalin, 1993, Anderlini, Felli and Riboni, 2007). In our approach, while introducing codified contracts is efficient in a static setting, it is optimal to allow agents to choose between the restricted and a free contract form. Our dynamic results suggest that more individual choice over contractual form is efficient. A very strictly codification of contracts may contribute to a legal orientation which becomes rigid and formalistic, and suppresses contractual innovation (Beck and Levine, 2005; Botero et al, 2003). Contrasts between local law and a rigidly codified doctrine may hinder the efficient development and enforcement of contract law and practice, just as legal systems imposed by conquest perform much worse than those willingly adopted (Berkowitz, Pistor, and Richard, 2002).

Yet some degree of standardization which preserves a general freedom of contract form is clearly beneficial in terms of access to the law and expansion in the scale of transacting. The diffusion of commercial codes for specific contracts in common law countries took place during the late XIX century period of rapid industrialization and international trade expansion. This confirms their usefulness in circumstances when transacting between diverse individuals becomes particularly valuable. The experience holds some relevance for the effort of many developing countries to strengthen their capacity for contract enforcement. It may justify an approach to create standardized templates with narrowly defined enforcement to enhance trade opportunities and encourage contracting among strangers. This is a

necessary mechanism for the emergence of an advanced division of labor and product specialization, and for the diffusion of tradable securities.

Our focus has been on the effect of different rules in the process of evidence collection in the context of a classic adversarial dispute resolution system. An interestinmg avenue for new research would address the role played by inquisitorial judges in civil law in addressing subversion of justice.

Finally, the paper offers some suggestive implications for developing countries, which are beset by an unequal distribution of resources as well as limited ability of many agents to sustain contractual disputes.

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Appendix

Proof of Proposition 1. Consider the problem where the court must enforce a price $(p, \Delta p)$ in the range $v \in \left[\underline{v}, \bar{v}\right]$, where $0 \le \underline{v} \le \bar{v} \le 1$ are two generic thresholds. The court observes and recognizes all signals such that $I \equiv \left\{i \middle| i \in \left[1-\bar{v}, 1-\underline{v}\right]\right\}$. Thus, the court perfectly identifies v if $i(v) \in I$ but it does not know where v lies in $\left[\underline{v}, \bar{v}\right]$ if $i(v) \notin I$. Then B and S respectively solve:

$$\max_{n_B \le \bar{v} - v} -\frac{n_S}{n_S + n_B}\Delta p - p - \theta_B n_B$$

$$\max_{n_S \le v - \underline{v}} -\frac{n_S}{n_S + n_B}\Delta p - p - \theta_S n_S$$

For every $v \in \left[\underline{v}, \bar{v}\right]$. A fall in the extent of uncertainty (i.e. a reduction in $\bar{v} - \underline{v}$) is reflected in a smaller number of signals the parties are allowed to buy. At $\underline{v} = 0, \bar{v} = 1$, the problem is the same as the one illustrated in Section 3. The first order conditions are the same as those in (8) and (9). There are four possible cases to consider and we study them one at the time below.

Case a): $\lambda_S = \lambda_B = 0$. Both constraints are slack. Call n_S^a, n_B^a the signals gathered in this equilibrium by the seller and the buyer. The first order conditions imply $n_S^a / n_B^a = \theta_B / \theta_S = \sigma$, $n_B^a = \left[\sigma/(1+\sigma)^2\right]\left[\Delta p / \theta_B\right]$, $n_S^a = \left[\sigma^2/(1+\sigma)^2\right]\left[\Delta p / \theta_B\right]$. In this equilibrium the average price is $E(p) = \left[\sigma/(1+\sigma)\right]\Delta p + p$. This equilibrium is feasible for $v \in \left[\underline{v} + n_S^a, \bar{v} - n_B^a\right]$, which can only happen if $n_B^a + n_S^a \le \bar{v} - \underline{v} \Leftrightarrow \theta_B + \theta_S \ge \Delta p / (\bar{v} - \underline{v})$. As a result, if $\Delta p \le (\bar{v} - \underline{v})$ the assumption $\theta_B + \theta_S > 1$ makes sure this is the case. We will later check if $\Delta p \le (\bar{v} - \underline{v})$ holds at the optimum.

Case b): $\lambda_S > 0, \lambda_B > 0$. Both constraints bind. It is easy to find that this equilibrium only exists if $\lambda_B + \lambda_S = \Delta p / (\bar{v} - \underline{v}) - (\theta_B + \theta_S)$. As a result, if $\Delta p \le (\bar{v} - \underline{v})$ this equilibrium is impossible.

Case c): $\lambda_S > 0, \lambda_B = 0$. Call n_S^c, n_B^c the signals gathered in this equilibrium by the seller and the buyer. The seller's constraint binds, i.e. $n_S^c = v - \underline{v}$ while $n_B^c = \underline{v} - v + \sqrt{(v - \underline{v})\Delta p / \theta_B}$. If $\Delta p \le (\bar{v} - \underline{v})$ this equilibrium holds for $v \le \underline{v} + n_S^a$. Now $E(p) = \sqrt{(v - \underline{v})\theta_B \Delta p} + p$.

Case d): $\lambda_S = 0, \lambda_B > 0$. Call n_S^d, n_B^d the signals gathered in this equilibrium by the seller and the buyer. The seller's constraint binds, i.e. $n_B^d = \bar{v} - v$ while $n_S^d = v - \bar{v} + \sqrt{(\bar{v} - v)\Delta p / \theta_S}$. If $\Delta p \le (\bar{v} - \underline{v})$ this equilibrium holds for $v \ge \bar{v} - n_B^a$. Now $E(p) = \Delta p - \sqrt{(\bar{v} - v)\theta_S \Delta p} + p$.

If $\underline{v} = 0, \bar{v} = 1$ the result of Proposition 1 is obtained.

Proof of Proposition 2. We keep studying the case where $v \in \left[\underline{v}, \bar{v}\right]$. Social welfare is equal to $\int_0^1 \left[e(v)v - e(v)^2/2\right]dv$, where $e(v) = E(price|v)$. To compute social welfare, begin to find:

$\int_{\underline{v}}^{\underline{v}+n_S^a} [\ ]$

After some algebra we find that for $v \in \left[\underline{v}, \bar{v}\right]$ we have

are slack and the first order conditions imply $n_S / n_B = \theta_B / \theta_S = \sigma$, $n_B = \left[\sigma/(1+\sigma)^2\right]\left[\Delta p / \theta_B\right]$, $n_S = \left[\sigma^2/(1+\sigma)^2\right]\left[\Delta p / \theta_B\right]$. In this equilibrium the average price is $E(p) = \left[\sigma/(1+\sigma)\right]\Delta p + p$. This equilibrium is feasible for $v \in \left[\underline{v} + n_S, \bar{v} - n_B\right]$, which can only happen if $n_B + n_S \leq \bar{v} - \underline{v} \Leftrightarrow \theta_B + \theta_S \geq \Delta p/(\bar{v} - \underline{v})$. As a result, if $\Delta p \leq (\bar{v} - \underline{v})$ the assumption $\theta_B + \theta_S > 1$ makes sure this is the case. We will later check if $\Delta p \leq (\bar{v} - \underline{v})$ holds at the optimum.

Appendix 2

2.1. Discrete Mass of Equal Agents

Suppose that there is a discrete mass $\mu > 0$ of equal agents (i.e. agents with $\sigma > 0$). Assume also that, when indifferent, the parties prefer to use a non-standard contract. At t=0, all equal parties litigate and at a given *v* the sellers collect $xv/2$ signals, the buyers collect $x(1-v)/2$ signals. The maximum number of signals collected by sellers is equal to $x/2$, which is precisely collected when $v=1$. This is a state where each of the μ sellers wins by collecting the same $x/2$ signals, which implies that at t=0 a total of $x/2$ "high index" signals are incorporated into precedents. By similar reasoning one finds that a total of $x/2$ "low index" signals are incorporated into precedents at t=0. As a result, the total amount of precedents created at t=0 is *x*. Notice that this number does not depend on the mass μ of equal pairs in the population because all these pairs collect the same signals (or subsets of other pairs' signals), in a sense duplicating their efforts.

Repeating this reasoning for all periods, it is easy to find that if $c < 5/32$ (so that equal parties use the template contract at t=0), $V(t)$ follows the differential equation $\dot{V} = -xV$.

By comparing this result with Proposition 4 it is easy to see that even with a discrete mass of equal agents, legal evolution under contract standardization is slower than in the case where template contracts are not available. Indeed, in the latter system not only equal but also unequal parties litigate and contribute to accumulate new precedents.

By taking this pattern of legal evolution into account, it is easy to find that under template contracts the present discounted value of social welfare when the current level of legal uncertainty is *V* is equal to:

$$W_S(V) = \frac{1}{\rho}\left\{\frac{1}{6} - c - \frac{\rho V^3}{(\rho + 3x)}\frac{1}{96}\right\} \tag{18}$$

Thus, even if with a positive mass of equal pairs some legal evolution takes place also under standardization, it is still the case that the speed of legal evolution is lower. By comparing (18) with (16) it is then easy to find that it is also still the case that standardization is preferable if x and/or ρ are small and inequality is large.