courts’ decision making without commitment: a comparative analysis

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a Comparative Analysis

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Abstract

The importance of legal origin has been stressed by recent empirical work. To understand this evidence, we set up a stylized model to study judicial decision making under the common and the civil law. We suppose that the role of the courts is to enforce the law. Courts are faced with an infinite sequence of decisions. We suppose that a fraction of courts are benevolent towards the parties. The optimal court’s decision may not be time consistent when judges lack commitment. We argue that, under some conditions, the common law tradition partly solves this problem thanks to the disciplinary role of the precedent (the state variable of the dynamic game played by common law courts). The civil law partly solves credibility problems by reducing courts’ discretion. We also show that courts make more congruous decisions under the common law. Finally, we study how the two legal traditions adapt to changing economic conditions.

Keywords: Legal Origins, Precedent, Dynamic Inconsistency, Courts, Property Rights, Markov Perfect Equilibria.

JEL Classifications: O17, K00, D02.

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1 Introduction

The importance of legal origin on various measures of economic performance has been emphasized by recent empirical studies. La Porta et al. (1997, 1998, 1999) show that the common law tradition is associated with better protection of outside investors, more developed financial markets, and more secure property rights. Moreover, Djankov et al. (2003) find that common law courts are more consistent (i.e., they treat similar people similarly). The aforementioned evidence seems then to validate the influential view by Richard Posner, among the others, that the common law promotes efficiency. Rajan and Zingales (2003) take a historical perspective and provide more nuanced evidence: they argue that common law countries had better financial development only after 1913.

As pointed out by La Porta et al. (2004), “... despite [the above] evidence, the exact mechanism through which legal origin matters has remained uncertain.” To investigate this issue, this paper models judicial decision making under the common and the civil law. We abandon the assumption that courts mechanically enforce the statutes, the precedents, or the contractual terms. Instead, we suppose that a fraction of courts are active, that is, they have some discretion in rule making.

In contrast to the standard literature, we assume that courts lack commitment in enforcing the law. If this is the case, benevolent judges may suffer from credibility problems: ex ante they announce a doctrine, but they deviate from their announcement ex post. Dynamic inconsistency problems arise (1) because courts rule after the parties have made their economic decisions and (2) because private agents make their choices based on expected rulings by courts. Credibility problems in courts may have serious consequences on economic outcomes. To see this, consider two examples of judicial decision making that have been the focus of attention in the literature on legal origin: the enforcement of property rights and the protection of investors. In both cases, courts may have an incentive to declare strict enforcement of property rights and strong investor protection in order to induce, respectively, high investment on property and cheaper access to financing. However, absent commitment, courts may renege on their announcements ex post. Anticipating this behavior, rational agents would make sub-optimal decisions.

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1 French saying of the eighteenth century.
2 The effect of legal origin on financial development has also been studied by Beck et al. (2003b).
3 Common law countries seem also to be associated with less aggressive regulation of new entry and labor markets (see Djankov et al., 2002, and Botero et al., 2003).
4 See Posner (1973) and Rubin (1977).
5 See also Lamoreaux and Rosenthal (2004).
6 In the contract theory literature, active courts are usually justified by hypothesizing that contracts are incomplete due to unforeseen contingencies, or because the state of nature is very costly to describe ex ante, as in Grossman and Hart (1986).
In this paper, we argue that the two legal traditions provide different institutional solutions to credibility problems. Furthermore, we claim that this difference has consequences in terms of efficiency and in the ability of each legal system to adapt to changing economic conditions.

According to traditional comparative law doctrine, the common law is mostly a judge-made law: i.e., the law is established by judicial precedents and decisions. The rule *stare decisis* demands that courts conform to decisions reached by previous courts.\(^7\) As a result, a common law court solves a dynamic problem, since its decision is going to become a precedent and potentially affect how future courts will rule. The civil law, conversely, is a codified system, where the role of judges is to interpret and apply a written body of statutes and administrative regulations. The underlying principle is that general rules are the domain of legislative, not judicial power. The civil law refuses any binding effect to previous judicial interpretation.\(^8\) Therefore, under the civil law courts’ decision-making is, at least with this respect, static.\(^9\)

Given all of the above, we can ask ourselves, why does the legal origin matter? A popular explanation argues that the two systems are different, because judges - the primary makers of law in the common law - are more insulated from special interests than legislatures. La Porta *et al.* (2004) find that judicial independence accounts for some of the positive effect of common law legal origin on economic freedom.

As mentioned before, this paper explores another answer to the above question. We claim that the two systems implement different economic outcomes (also) because they deal differently with credibility problems in courts. The civil law partly solves these problems by limiting the discretion enjoyed by the courts. In the common law, the lawmaking power has been implicitly delegated to judges.\(^10\) Therefore, common law courts are potentially more exposed to dynamic consistency problems. We show that, under some conditions, the common law partly solves credibility problems thanks to the disciplinary role of the precedent.

We now discuss the rule of precedent given its crucial role in our model. The rule *stare decisis* has two components. First, a decision made by a higher court is binding precedent which a lower court

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\(^7\) *Stare decisis* is a Latin term which means “to stand by decided cases.”

\(^8\) Von Mehren (1957), Chap. 16, argues that this principle holds strictly in France, where even precedents by a hierarchically superior court are never binding, and to a lesser degree in Germany.

\(^9\) We mention other differences between the two legal traditions. (1) The two systems differ in the ways of exposing evidence in court: adversary (in the common law) vs. inquisitorial procedure (in the civil code). (2) Judges in the common law are elected or appointed by the executive (usually the legislative body must confirm the appointment), while in the civil law we have a career judiciary with training and promotion inside the ranks. (3) Statutes are usually not retroactive and legislatures must think in abstract. As Cooley (1868) writes: “[I]t is said that which distinguishes a judicial from a legislative act is, that the one is a determination of what the existing law is in relation to some existing thing already done or happened, while the other is a predetermination of what the law shall be for the regulation of all future cases.”

\(^10\) See Calabresi (1982), Chap. 9, for a discussion of the democratic legitimacy of court-made law.
cannot overturn. This principle is known as vertical *stare decisis*. Second, the rule states that a court should not overturn its own precedents, unless there is a strong reason to do so, and should be guided by principles from lateral and lower courts. The second principle (sometimes known as horizontal *stare decisis*) is an advisory one, which courts occasionally ignore. This paper focuses on horizontal *stare decisis*, because we do not model a system with hierarchical courts; this simplification, however, does not affect our results.\(^ {11}\)

The rule of precedent confounds many scholars and “still demands convincing explanation.”\(^ {12}\) The usual argument against *stare decisis* is the following. Previous decisions may be unjust; if precedents are strictly observed, errors will be repeated. With respect to the doctrine of precedent, Max Radin wrote:

“\[\text{If a court follows a previous decision, because a revered master has uttered it, because it is the right decision, because it is logical, because it is just, because it accords with the weight of authority, because it has been generally accepted and acted on, because it secures a beneficial result to the community, that is not an application of \textit{stare decisis}. To make the act such an application, the previous decision must be followed because it is a previous decision and for no other reason.}^{13}\]

This quote acknowledges that *stare decisis* may create inefficiencies. If this is so, what is the rationale for this rule?

A number of reasons have been suggested for why courts should strive to follow the precedent from case to case: the protection of reliance interests, the need for certainty and predictability in the law, and the promotion of confidence in “the rule of law.”\(^ {14}\) In our opinion, the above justifications are mainly based on paternalism and should not matter in a model like ours where agents are rational and fully informed. Another common explanation is the need of treating similar cases equally. In essence, the argument goes, in a system where judges have full discretion, the rule of precedent defends private agents against the whims of the judges. With respect to this justification, we believe that a more effective defense in case of prejudiced decisions is the possibility of overruling by higher courts.

In this paper, we provide a novel explanation for the rule *stare decisis*. We show that the rule of precedent is a commitment device that helps in solving credibility problems by judges. The potential

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\(^{11}\) If higher courts have the same preferences as lower courts, they are also subject to credibility problems.

\(^{12}\) Peters (1996).

\(^{13}\) Radin (1933).

\(^{14}\) The need for certainty has been emphasized, among the others, by Coase (1960): “If market transactions were costless, all that matters (questions of equity apart) is that the rights of the various parties should be well-defined and the results of legal actions easy to forecast.”
inefficiency implicit in the rule *stare decisis* acts as a threat that avoids deviations from the optimal decision. The intuition is the following: courts’ one-shot deviations from the ex ante optimal decision (may) have lasting consequences in the common law tradition, since overruling an ex ante optimal precedent implies a change of the state variable (the precedent) for future courts. This deviation may have a long run cost that outweighs the gain of a one-shot deviation. However, we show that the disciplinary role of the precedent is effective only when there are conservative judges (i.e., judges that strictly follow the precedent). In fact, when judges are all benevolent, it is not credible that future courts will hold an inefficient precedent (notice that we rule out trigger punishments by adopting Markov perfection as a solution concept).

In our model, civil law courts play a static game: judges follow (with some latitude) statutes that are written by the legislature. We show that codes are written in a strategic way to counter the ex post incentive of courts to balance utilities. Since legislatures cannot tailor the code to the type of judge who will handle the case, having heterogenous judges reduces welfare in the civil law: some courts interpret the code literally, others apply an ex post test of reasonability. Due to incongruity in rule making, private agents face more ex ante uncertainty under the civil law compared to common law.

In Section 7 we study how the two legal traditions adapt to changing economic conditions. As a benchmark, we modify our model to eliminate any incentive on the part of the courts to deviate from the announced doctrine. We show that, absent credibility problems, the common law proceeds by “slow advances” compared to the civil law. This is so because of the (welfare reducing) inertia introduced by the rule of precedent: common law courts innovate cautiously, since future judges may confirm the current decision, even if it was meant to address a different economic condition. With respect to the “size” of the adjustment, what matters is the persistence of the shock (in our model, common law courts adjust less to temporary shocks) and the proportion of judges that strictly apply the rule of precedent (if the proportion is high, adjustments are smaller). In the civil law, this caution is not necessary, since current decisions have no effect on how future legislatures will make the law. However, there are shocks that are better dealt with in the common law system: common law courts, given their leeway in deciding a case, respond more to shocks that are idiosyncratic to private agents and to shocks that occur after the legislature has set the law.

Finally, we analyze uncertainty and credibility problems jointly. We argue that, due to the rule of precedent, the severity of credibility problems depends on the occurring shock: i.e., private parties expect courts to deviate more from the (state-contingent) optimal decision under certain shocks. We refer to Section 7 for the underlying intuition of this result.

The remainder of the paper is organized as follows. Section 2 provides a few examples of credibility problems in rule making; Section 3 reviews the literature. The model is introduced in Section 4; Section
5 and 6 solve, respectively, the common law and the civil law game. In Section 7 we analyze how the two legal traditions react to the changing economic conditions. Section 8 concludes.

2 Credibility Problems in Courts

We now discuss a few examples where “bad” outcomes occur due to credibility problems in courts.

Example 1 The “Three strikes” Law

According to “three strikes” laws - a category of statutes enacted by state governments in the US - people who are convicted of a felony on three (or more) separate occasions may face life in prison. The underlying logic of these laws is as follows: any person who commits more than two felonies can be considered chronically criminal and therefore permanent imprisonment is justified. Some unusual scenarios have arisen - particularly in California, which punishes shoplifting and similar crimes as felonies if the person committing the crime has a prior conviction for any form of stealing, including robbery or burglary. This has led to some defendants being sentenced to 25 years to life in prison for stealing items such as compact discs or even slices of pizza. “[A] backlash is growing. .... Several juries have refused to convict obviously guilty defendants when lawyers found ways to indicate that their clients would be subject to a third-strike penalty. Some judges are using the leeway the three-strikes law allows them to avoid counting earlier crimes as strikes, thereby averting a potential life sentence.”\footnote{Time Magazine, November 11, 2002.} This example shows that ex post, after the crime has been committed, courts may decide something that deviates from the strict rules that they are supposed to enforce. If criminals understand this, more crimes are committed.

Example 2 Optimal Decision to Void a Contract

The example is taken from Anderlini et al. (2004). They consider a model where one party (the buyer) makes an initial investment prior to signing a contract and he is hurt if the contract is voided. They suppose that some unforeseen contingencies can make it very costly for the other party (the seller) to fulfill the contract. A trade-off arises: if the contract is voided too often, there is little initial investment ex ante. If the contract is upheld even after large shocks, there is little insurance ex post. Judges follow a cut-off rule which prescribes that contracts should be voided when shocks fall above a certain threshold. This cut-off rule is usually not time consistent. Absent commitment, judges, in order to provide insurance, void contracts more often than they announced ex ante. Under investment occurs in equilibrium as a result.

\footnote{Time Magazine, November 11, 2002.}
Example 3 Investor Protection and the Bubble Act

In England, after the South Sea Bubble, the House of Commons passed the Bubble Act in 1720. According to this act, the formation of joint-stock corporations needed to be authorized by the state and the establishment of new joint-stock corporations and large partnership in the financial sectors was explicitly prohibited.\(^{16}\) According to the traditional explanation, the Bubble Act was passed to limit speculation in the stock market and protect investors.\(^{17}\) To circumvent the difficulty of obtaining the authorization of the state, the business community developed an adequate substitute for the business corporation. Many unincorporated joint-stock companies were formed and designed in such a way that, de facto, these companies enjoyed, up to a certain extent, limited liability, transferable interests, and other main features of the joint-stock corporations. Common law courts continuously evolved their interpretation of the rules prescribing which companies did and did not violate the spirit of the act. During the eighteen century, the Bubble Act was not applied to unincorporated companies. This attitude changed drastically by 1808 after a wave of new speculations and joint-stock promotions that echoed those of 1720. This example highlights the possibility of bypasses in the common law system, resulting from to the ability of the judiciary to challenge the will of the state. It was precisely to limit the discretion of judges who were still associated with the ancien régime that the Napoleonic Code was established in France.

Example 4 Penalty Clauses

Penalty clauses state in advance what amount of money has to be paid if one party fails to perform. Such clauses are meant to provide incentives to abide by the terms of the contract. However, ex post courts may find these clauses too onerous for the promisor if, for example, an unforeseen contingency has occurred. Again, a trade-off between providing incentives and ex post insurance arises. With regard to such clauses, there is a remarkable difference between civil law and common law traditions. Historically, the civil law approach is apparent from article 1552 of the Napoleonic French code: “When an agreement provides that the party who fails to perform it shall pay a certain amount of damages, no larger or smaller amount may be awarded to the other party.” No discretion is given to the courts, consistent with the freedom-of-contract philosophy of the French revolutionary reform program. This provision therefore solves credibility problems at the cost of not providing ex post insurance. The strict provision of the Napoleonic Code has now been abandoned practically everywhere and civil law, while permitting penalty clauses in principle, allows an ex post test of reasonability, thereby opening the door

\(^{16}\) Joint-stock companies were able to raise much larger capital sums than could be pooled by a standard partnership.

\(^{17}\) For a review of other competing explanations, see Harris (2000).
to credibility problems. Judges can now reduce the stipulated amount of a fine if it appears unreasonable at the moment of its enforcement, even if it was reasonable at the moment of stipulating the contract.

On the opposite extreme, common law explicitly prohibits enforcement of contractual penalties in general, but it allows for liquidated damages clauses. The underlying idea is that courts, not individuals, should decide the proper manner in which to enforce contractual obligations. Common law allows penalty clauses to stand if they are introduced by the parties with the intention of predicting the actual amount of the damage and not with the intention of introducing a coercion to perform properly. To overcome any potential credibility problems resulting from this large degree of discretion, the common law excludes any ex post test of reasonability. Common law allows liquidated damages clauses to stand if they seemed to be a reasonable estimate ex ante of the actual harm caused by non-performance, although this is unreasonable ex post.18

3 Literature Review

A close reference for our paper is the work by Anderlini et al. (2003, 2004). In a model where courts affect investment decisions taken by the contracting parties, the authors fully characterize the optimal decision of a benevolent court to void or uphold a contract. While their focus is on the solution with commitment, they acknowledge that this solution may be time inconsistent. However, they hint at the fact that courts do not deviate from the ex ante optimal decision, because they realize that adherence to the precedent would lead to excuse performance in similar circumstances in future rulings. Starting with the same intuition, this paper assesses the disciplinary role of the precedent by modelling the judicial process as a dynamic game.

Lewis and Poitevin (1997) and Sanchirico (1997) model how courts gather evidence and make decisions when there is imperfect information. They show that, in some circumstances, judicial procedures are dynamic inconsistent: Bayesian courts benefit from committing ex ante to a decision rule that does not make optimal use of information ex post.

Recent literature has focused on the effect of legal systems on how contracts are written. Gennaioli (2003) studies how judicial discretion affects the form and the efficiency of private contracts. He argues that the contracting parties write more contingent contracts if they operate under the common law. Bond (2003) focuses on corruption in the courts. He shows that the fact that judges can accept bribes not to enforce a contract induces the parties to omit from the contract contingencies that may require judicial interpretation.

The question of the efficiency of the common law is not, of course, a new topic. The law and

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18 On penalty clauses from a comparative perspective, see Mattei (1997), Chap. 7.
economics literature has extensively analyzed specific common law doctrines to determine if they are efficient. Based on this examination, Posner (1973) forcefully concluded that the common law is efficient. What is less clear, however, is the mechanism that leads to efficiency. Posner’s argument for the superiority of common law relies on the assumption that judges, supposedly more insulated than legislatures from lobbies and interest groups, pursue efficiency. According to Rubin (2000), “this explanation was and is not terribly convincing ... because it ultimately relies on judicial tastes for efficiency.” Motivated by this criticism, some economic and law scholars have suggested, based on evolutionary arguments, that the common law converges to efficient legal rules even if not all judges maximize efficiency. Genaioli and Shleifer (2005) evaluate this claim. They build a model of precedent formation by appellate courts and show that the common law evolves towards better legal rules only under special conditions. The bias of some judges and the fact that changing the precedent is costly are the reasons why, in their model, efficient rules may not be implemented: in our model, the lack of commitment is what creates inefficiencies.

Another body of literature has recognized that interest groups could use either common or statute law to achieve their goals. Bailey and Rubin (1994) model the process by which an interest group may be instrumental in changing the common law. Beck et al. (2003a) argue that legal traditions that adapt efficiently to the needs of the contracting parties will more effectively encourage financial development than will more rigid systems. The fact that statutory law is, in their opinion, slow and costly to change would explain why common law countries have better-developed financial markets and better property rights protection than French civil law countries. Lamoreaux and Rosenthal (2004), comparing the U.S. and France during the eighteen century, claim that there is no evidence that the contracting environment in the U.S. was either freer or more adaptable than France.

4 The Model

We write a model to capture the courts’ trade-off between providing incentives and ex post efficiency. Our setup is stylized, because our intention is not so much to derive the optimal decision for the court in a full-fledged model, but to analyze how the two legal traditions deal with credibility problems.

The players are two (short-lived) private agents (A and B) and a continuum of (long-lived) courts, distributed over an interval [0, 1] of jurisdictions. We suppose that there are two types of judges: a fraction $\gamma$ of judges, with $\gamma \in [0, 1]$, are conservative (they make decisions in a mechanical way); a fraction $1 - \gamma$ are benevolent (they make decisions according to an utilitarian criterion). The types of each judge are perfectly known by the private agents. In the civil law there will be another player, the legislature, whose task is to write the statute that will be enforced by the courts. In our model,
legislatures and judges share the same preferences. In our opinion, this assumption is not far-fetched, especially in the common law where judges are elected or appointed by politicians. Along the same lines, Cardozo writes: “Substitute statute for [judicial] decision, and you shift the center of authority, but add no quota of inspired wisdom.”

During each period \( t \), with \( t = 1, 2, \ldots, \infty \), agents \( A \) and \( B \) (living one period) are born in one jurisdiction at random. We suppose that party \( A \) makes a costly investment \( e \), with \( e \in \mathcal{E} \) (\( \mathcal{E} \subset \mathbb{R}^+ \) is a compact set) that increases both \( A \)'s and \( B \)'s payoff.\(^{20} \) This investment is non contractible. After \( A \) has chosen \( e \), the court intervenes by making a decision \( p' \) that affects both parties.\(^{21} \) We suppose that \( p' \in [0, 1] \).\(^{22} \) To keep the model general, we choose not to specify the content of the law enforced by judges. One possible reading is to suppose that \( p' \) is a measure of security of property rights: \( p' = 1 \) would stand for an absolute property right, while \( p' = 0 \) would imply that property is often expropriated.\(^{23} \) We advance this interpretation for two reasons: because property rights are vital for economic development and because legal origin seems to account for cross-country differences in the security of property rights.\(^{24} \)

The same courts do not necessarily make decisions all the time, but, in a symmetric equilibrium, identical courts follow the same strategy. In the common law system, the decision \( p' \) of the court is going to become a precedent in the next period. In the civil law, courts make decisions based on the provisions of the written law.

The utility function of party \( A \) is

\[
u_A(p', e) = h(p', e) - c(e).
\]

The utility of party \( B \) is separable in \( p' \) and \( e \):

\[
u_B(p', e) = v(p') + f(e).
\]

We make a few assumptions about preferences:

\(^{19} \) Cardozo (1924), at p. 133.

\(^{20} \) An investment that benefits both parties goes under the name of cooperative investment (see Che and Hausch, 1999). A case of cooperative investment is provided by the classic example of Fisher Body and GM. The decision to build a plant adjacent to GM would have lowered shipping cost and improved supply reliability, therefore benefiting both parties.

\(^{21} \) Here, we make the extreme assumption that the two parties inevitably go to court. Equally, we can assume that \( p' \) is specified in the contract; the two parties then go to court only if they expect a different \( p' \). In this case, they would agree on the same \( p' \) that courts would choose and our results would be unaffected.

\(^{22} \) Clearly, in practice precedents differ one from the other qualitatively. We put some metric on the decision space for the sake of tractability.

\(^{23} \) There is a large body of literature that analyzes conditions under which the allocation of property rights restores efficiency in models where private agents lack commitment (see, for instance, Maskin and Tirole, 1999). This literature, however, assumes that benevolent courts have commitment.

\(^{24} \) See Levine (2005) for a review of the literature on law and property rights.
Assumption 1: We suppose that $h_0', h_1', h_1'' > 0$, and $h$ is strictly concave in $(p', e)$. Moreover, $c' > 0$ and $c'' > 0$.

Assumption 2: We suppose that $v' < 0, v'' < 0, f' > 0$, and $f'' < 0$.

The two agents have opposite preferences regarding $p'$. After $e$ has been selected, the preferred decision for $A$ ($B$) is $p' = 1$ ($p' = 0$).

Developing further our motivating example, we can interpret party $A$ as the owner of a plot of land. The amount of investment $e$ on that plot is chosen by $A$ depending (in a positive way) on the security of his property right. We can imagine 1) that the investment has a positive externality on, say, the neighbor $B$ and 2) that the utility of $B$ increases by diminishing the property right of $A$ (for example, because $B$ would like to be able to pass through $A$’s plot). Another interpretation is that $A$ and $B$ are involved in a business relationship and write a contract. The investment is non verifiable and increases the value of the relationship for both parties. The decision $p'$ might then be, for example, the cut-off rule that courts follow to decide whether or not to void the contract after some unforeseen contingencies, as in Anderlini et al. (2004).25

Benevolent judges believe in legal instrumentalism: i.e., their view is that the law should be used as a tool to balance competing societal interests. They maximize the following intertemporal utility,

$$
\sum_{t=0}^{\infty} \delta^t w(p_t, e_t),
$$

where

$$
w(p_t, e_t) = \theta u_A(p_t, e_t) + (1 - \theta) u_B(p_t, e_t),
$$

with Pareto weights $\theta \in (0, 1)$ and discount factor $\delta \in (0, 1)$.

Conversely, conservative judges are judges that strictly follow the precedent (in the common law) or the law (in the civil law). There are different reasons why judges do not operate in a substantive way (i.e., by creating and defining rights and duties). Judges are conservative, either because they adhere to legal formalism (i.e., they believe that the law consists of a body of rules and judges have no authority to act outside rules, and hence no discretion), or because they follow simple behavioral rules.26

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25 This second interpretation requires more qualifications. First, since parties are free to enter into a business relationship, we must assume that $A$ and $B$ want to write a contract, no matter what the court will decide. Moreover, we should modify the utilities to include dimensions that are actually chosen by the contracting parties. Right now, the two utilities depend only on $e$, which is non-contradictible, and $p'$, which is chosen by the courts.

26 “When judges are trained to think in mechanical and doctrinal rather than functional and substantive terms, mental habits are developed that stand in the way of the perception requisite to a truly functional approach.” Von Mehren, (1957), at p. 825. For a comparison of instrumentalistic and formalistic legal theories, and their respective influence on American jurisprudence, see Summers (1982).
In the remainder of this section we consider the solution with commitment. We will show that this solution is not time consistent when courts lack commitment. In fact, courts have an incentive to announce a high $p_0$ to induce investment, and lower $p_0$ ex post to balance utilities. Absent commitment, investment is lower as a result.27

Before solving for the optimal courts’ decision, we characterize the investment rule of party $A$, denoted by $\Phi : [0,1] \rightarrow E$. The investment $e$ depends on the announced $p_0$. Assuming an interior solution, the investment decision is found implicitly from the first order condition of party $A$,

$$h_2'(p', e) = c'(e).$$

**Lemma 1:** The investment function $\Phi(p')$ of party $A$ is strictly increasing on $[0,1]$.

**Proof:** See the Appendix.

To insure concavity of $\Phi(p')$, we further make a few assumptions about the third derivative of $h(.,.)$ and $c(.,)$, so that

$$\Phi'' = -\frac{h'''_{111} + 2h'''_{112} \Phi' + (\Phi')^2 (h'''_{222} - c''')}{h_{22} - c'} < 0.$$

Next, we analyze the optimal ex ante decision $p^*$. Since the economy is of the repeated type, $p^*$ is constant over time.

**Definition 1:** The ex ante optimal decision $p^*$ is defined as

$$p^* = \arg \max_{p' \in [0,1]} \theta \left[ h(p', \Phi(p')) - c(\Phi(p')) \right] + (1 - \theta) \left[ v(p') + f(\Phi(p')) \right].$$

27 The fact that the absence of binding contracts lowers investment is a common theme in the hold-up literature: see, for example, Grout (1984).
First, we argue that the induced utility of the court is strictly concave in \( p' \). This is so because it is the sum of strictly concave functions. The first term is the indirect utility of \( A \), which is strictly concave given that \( A \)'s utility is assumed to be strictly concave in \((p', e)\).\(^\text{28}\) The utility of \( B \) is also strictly concave in \( p' \), since \( v \) and \( \Phi \) are strictly concave, and \( f \) is strictly concave and increasing.

Assuming an interior solution, \( p^* \) is implicitly defined by the following condition

\[
\theta h'(p^*, \Phi(p^*)) + \Phi'(p^*) (1 - \theta) f'(\Phi(p^*)) = -(1 - \theta) v'(p^*). \tag{3}
\]

We can easily see that, absent commitment, the ex ante optimal decision \( p^* \) is not time consistent. In fact, after \( e \) has been selected, \( p^* \) does not solve the ex post first order condition of the court,

\[
\theta h'(p', e) = -(1 - \theta) v'(p'). \tag{4}
\]

The difference between conditions (3) and (4) is given by the term \( \Phi'(1 - \theta) f' \). The incentive to increase \( p' \) to encourage investment disappears ex post, after \( e \) has already been sunk. Let \( p^{ne} : \mathcal{E} \to [0, 1] \) define the ex post decision, for a given \( e \). Since \( \Phi'(1 - \theta) f' > 0 \), for any given investment level the ex post decision of a benevolent court is located to the left of the optimal decision (see Figure 1).

Notice that the externality of \( e \) on \( B \)'s utility is crucial to have credibility problems. Without it, courts have no incentive to induce higher \( e \) than \( A \) would like, since they do not disagree with \( A \) about the optimal level of investment.

**Lemma 2:** The ex post courts’ decision \( p^{nc} \) is strictly increasing on \( \mathcal{E} \).

**Proof:** See the Appendix.

Figure 1 illustrates the investment rule and the decision rule of the court with and without commitment. The equilibrium with commitment is denoted by \( E^* = (p^*, e^*) \). The static equilibrium without commitment is denoted by \( E^{NC} = (p^{nc}, e^{nc}) \). Both \( e \) and \( p' \) are lower in \( E^{NC} \) compared to \( E^* \). Without any institutional constraints on judges, the economy ends up in a “bad” policy outcome with low investment and inefficient laws. Note that party \( A \) prefers \( E^* \) to \( E^{NC} \), since the indirect utility of \( A \) increases in \( p' \). However, party \( B \) may actually prefer the equilibrium without commitment: that is, a low \( p' \) may compensate \( B \) for the low investment. Overcoming credibility problems may therefore have distributive consequences for the two parties.

---

\(^{28}\)The proof is standard. Let \( V_A(p') \) define the indirect utility of party \( A \). We show that for any \( p' \) and \( p'' \) and any \( \lambda \in (0, 1) \), we have that \( V_A(\lambda p' + (1 - \lambda) p'') > \lambda V_A(p') + (1 - \lambda) V_A(p'') \). Define \( \lambda p' + (1 - \lambda) p'' = p \). Investments \( e' \) and \( e'' \) denote, respectively, \( e' = \Phi(p') \) and \( e'' = \Phi(p'') \). Define \( e' = \lambda e' + (1 - \lambda) e'' \). Investment \( e' = \lambda e' + (1 - \lambda) e'' \) is feasible, but not necessarily optimal if decision \( p \) is expected. Then, \( V_A(p) \geq V_A(p) > \lambda V_A(p') + (1 - \lambda) V_A(p'') = \lambda V_A(p') + (1 - \lambda) V_A(p'') \).
Legislature chooses the law $l$

<table>
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<tr>
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<th>Party A chooses $e$</th>
<th>Court sets $p'$</th>
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<td>$t_1$</td>
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<td>$t_3$</td>
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Figure 2: Timing in the Civil Law

In the following sections, we will describe how the two legal systems improve (from an utilitarian perspective) upon the (institution-free) equilibrium without commitment.

5 The Civil Law System

This section analyzes the civil law game. The timing, illustrated in Figure 2, is the following. A benevolent legislature sets the law $l$ before knowing the jurisdiction in which $A$ and $B$ will be born. At the second stage, party $A$ chooses $e$ knowing the type of the judge in his jurisdiction. Finally, courts choose $p'$. We will suppose that the courts are not entirely bound by the code, but that they have some discretion in interpreting the law. We solve the model backwards from the last stage.

**Last Stage:** The decision rule of a benevolent court, for a given law $l$ (which is chosen in the first stage) and for a given $e$ (which is chosen by $A$), is

$$G(l, e) = \arg \max_{p' \in [l-\varepsilon, l+\varepsilon]} \left[ \theta u_A(p', e) + (1 - \theta) u_B(p', e) \right].$$

The constant $\varepsilon$ is a measure of judicial latitude (or independence) in enforcing the law. We suppose that $\varepsilon > 0$, but sufficiently small, $\varepsilon < |p^{nc}(e^*) - p^*|$. The decision rule $G(l, e)$ is shown in Figure 3 for a given $l$: when the constraints are not binding, the decision rule of the judge coincides with the one implicit in equation (3b); otherwise, the decision rule is a horizontal line at $l - \varepsilon$ or $l + \varepsilon$. The decision rule of a conservative judge is simply $G^C(l, e) = l$.

**Second Stage:** Since we suppose that party $A$ knows the identity of the judge, we will have two investment rules, $\overline{\Phi}^C, \overline{\Phi}: [0, 1] \rightarrow \mathcal{E}$, depending on which judge is going to decide: that is,

$$\overline{\Phi}(l) = \arg \max_{e \in \mathcal{E}} u_A(G(l, e), e), \quad \overline{\Phi}^C(l) = \arg \max_{e \in \mathcal{E}} u_A(l, e).$$

**First Stage:** The legislature sets the law $l$ without knowing which judge will handle the case, taking as given the investment rule $\overline{\Phi}$ and the decision rules of the courts. The optimal decision of the legislature is then

$$l^* = \arg \max_l \left[ (1 - \gamma)w \left( G(l, \overline{\Phi}(l)), \overline{\Phi}(l) \right) + \gamma w \left( l, \overline{\Phi}^C(l) \right) \right].$$
We can easily find out the optimal law when $\gamma = 1$ and $\gamma = 0$. In particular, when all judges are benevolent, the law is set in a strategic way to offset the courts’ incentive to deviate ex post. Suppose instead that $\gamma \in (0,1)$. Setting the law strategically is costly when the judge that handles the case is conservative, because he interprets the law literally. The next proposition argues that the optimum can be implemented in the civil law only if $\gamma = 0, 1$; otherwise, the civil law never implements the optimal decision $p^\ast$.

**Proposition 1:** If $\gamma = 0$ (resp. $\gamma = 1$), the civil law implements the optimal decision $p^\ast$ by choosing $l^\ast = p^\ast + \varepsilon$ (resp. $l^\ast = p^\ast$). Suppose instead $\gamma \in (0,1)$. If $\varepsilon > 0$, the legislature sets the law (strictly) between $p^\ast$ and $p^\ast + \varepsilon$. Then the optimal decision $p^\ast$ is never implemented in the civil law.

**Proof:** See the Appendix.

The level of investment and the final decision change depending on the judge handling the case (compare points B and C in Figure 3). Courts’ decisions oscillate between $l^\ast > p^\ast$ (when a conservative judge makes decision) and $l^\ast - \varepsilon < p^\ast$ (when a benevolent judge decides); with respect to $\varepsilon$, we observe periods of over-investment and periods of under-investment. The civil law introduces cycles in the economy because legislatures face heterogenous judges and cannot tailor the code to the type of judge who handles the case. This result explains the evidence given by Djankov et al. (2003), who find that civil law courts are less consistent (i.e., they treat equal people differently).

Judicial independence (a large $\varepsilon$) is welfare reducing since it increases credibility problems when a benevolent judge decides and induces the legislature to increase $l$ compared to $p^\ast$, which is costly when
a conservative judge decides.\(^{29}\) The next corollary follows from the previous proposition.

**Corollary 1:** *The welfare loss of the civil law (compared to the solution with commitment) is a non-monotone function of \(\gamma\) and increases in \(\varepsilon\).*

**Proof:** See the Appendix.

**REMARK 1:** The above discussion offers a rationale for why statutes are usually not retroactive. If laws were retroactive, legislatures, by intervening ex post, could undo what the judges have decided. Then, we cannot avoid the time inconsistent outcome. In our model, the legislator is not subject to credibility problems because he does not play after the investment has been sunk.\(^{30}\)

We support our claim that statutes are written in anticipation of the application of the law by looking at the conception of property rights in the French legal system. The French Napoleonic Code’s idea of property is inspired by the naturalistic ideology. Article 544 famously states that ownership is the right to use and dispose of property in the most absolute way. In the French revolutionary reform program, having individual sovereignty over property was regarded as the most effective barrier against the unrestricted power of the state. The natural law idea of property was soon challenged because of the (likely) antisocial consequences of having absolute property rights when there are externalities. However, the French Code kept proclaiming an absolute proprietary freedom, but French courts escaped from a literal interpretation of the Code. Comparing nuisance laws in France and England, Weir writes:

> “French law initially gives a broad right by statute and then restricts its antisocial use by the courts; in England, when it is the courts who announce the rights, they do it so very restrictively that there is little need for an equitable temperance of their exercise.”\(^{31}\)

This example suggests that the law often sets stricter rules than the ex ante optimum, so that the ex post courts’ decision is closer to the optimum.

\(^{29}\) This last result disagrees with the evidence by La Porta *et al.* (2004), who argue that judicial independence cancels the differences in the security of property rights between countries of English and French legal origin. (However, for other dimensions of economic freedom, such as regulatory formalism, the effect of judicial independence does not seem to be significant in the civil law countries) This divergence might be caused by several factors. Our model, by assuming that both judges and legislatures pursue efficiency, would understimate the benefit of judicial independence. Moreover, our measure of judicial independence does not coincide with the measure adopted by La Porta *et al.* (2004).

\(^{30}\) Given that time inconsistency in legislatures is a concern in practice (see, for an example, Bolton and Rosenthal 2002), our model probably overstates the efficiency of statutory law. However, the existing literature has suggested various institutional constraints (supermajorities, for example) to deal with such time inconsistency.

\(^{31}\) Weir in Catala and Weir (1964) at p. 238.
6 Courts’ Decision Making in the Common Law

Common law courts play a dynamic game. The state variable includes the current precedent, which is denoted by \( p \in [0,1] \). In order to make credibility problems less severe, the common law does not “tie the hands” of the judges, as the civil law does. In fact, the precedent \( \text{per se} \) does not affect the current utility of the judge or the set of feasible judgements.\(^{32}\) We suppose that judges can make any decision \( p' \) in the entire interval \([0,1]\). Note that so far not a single judge has ever been impeached for not following a precedent, even when the precedent was from a superior court.

As mentioned earlier, we adopt Markov perfection as a solution concept.\(^{33}\) A strategy for party \( A \) when a benevolent judge makes decisions is denoted by the function \( \Phi : [0,1] \rightarrow \mathcal{E} \), which associates an investment level with the current precedent. When a conservative judge is deciding, the investment strategy is denoted by \( \Phi^C \). A strategy for a benevolent judge is represented by the function \( G : [0,1] \times \mathcal{E} \rightarrow [0,1] \), which associates a new decision with a precedent and an investment decision. In our stylized model, the legislature is not a player anymore.

The state variable when a benevolent judge decides is \((p,e)\). The current decision \( p' \) will become the new precedent in the next period. The Bellman equation of a benevolent judge, taking as given the investment rule \( \Phi \), is

\[
V(p,e) = \max_{p' \in [0,1]} \left[ w(p',e) + \delta(1-\gamma)V(p',\Phi(p')) + \delta\gamma V^C(p',\Phi^C(p')) \right],
\]

(FE)

where \( V^C \) is the value function of a benevolent judge when a conservative judge is handling the case. Since a conservative judge always keeps the precedent,

\[
V^C(p,\Phi^C(p)) = w(p,\Phi^C(p)) + \delta(1-\gamma)V(p,\Phi(p)) + \delta\gamma V^C(p;\Phi^C(p)).
\]

The following is the definition of a differentiable Markov perfect equilibrium for the common law game.

**Definition of Equilibrium:** A Markov Perfect Equilibrium (MPE) is a set of decision rules \((\Phi,\Phi^C,G)\) such that,

\(^{32}\)Gennaioli and Schleifer (2005) suppose instead that changing the precedent is costly.

\(^{33}\)This rules out history dependent strategies. Maskin and Tirole (2001), among the others, motivate this choice.
i) for all $p, \Phi$ and $\Phi_C$ solve the first order condition (2), given $G$,

ii) for all $(p,e)$, $G$ solves the right hand side of (FE), given the investment rules $\Phi$ and $\Phi_C$.

After solving for $V^C(p,e)$, we can rewrite the Bellman equation as

$$V(p,e) = \max_{p' \in [0,1]} \left[ w(p',e) + \frac{\delta\gamma}{1-\delta\gamma}w(p',\Phi^C(p')) + \frac{\delta(1-\gamma)}{1-\delta\gamma}V(p',\Phi(p')) \right].$$

The envelope condition would be

$$V'(p,\Phi(p)) = (1-\theta) f'(\Phi(p))\Phi'(p).$$

After plugging the envelope condition in the first order condition of (FE), we obtain the generalized Euler equation (GEE) of the judge:

$$\{\theta h_1'(p',e) + (1-\theta) v'(p')\} + \left\{ \frac{\delta\gamma}{1-\delta\gamma}w'(p',\Phi^C(p')) \right\} + \left\{ \frac{\delta(1-\gamma)}{1-\delta\gamma}(1-\theta) f'(\Phi(p'))\Phi'(p') \right\} = 0. \quad \text{(GEE)}$$

The first term of the GEE is the current benefit of a deviation from the announced doctrine. The second term represents the cost of having a “bad” precedent after the deviation. It depends on $\gamma$: the larger the $\gamma$, the longer the economy will be subject to a “bad” precedent. Only if we have a judicial system with heterogenous judges, decisions by a benevolent judge cannot be easily undone, because there is some probability that conservative judges will handle future cases. The third term depends on how party $A$ reacts to a change of precedent.

In the literature that relies on trigger strategies, decision makers are usually homogenous and the second term is zero as a result. The third term is what sustains the optimal outcome. Deviations from the optimal policy change a “reputational state variable” and, consequently, the economy moves to a Pareto inferior equilibrium. Because of the long run cost associated with a one-shot deviation, the optimal decision becomes time consistent. In a Markov environment where only the current precedent is a state variable, this threat is usually not credible for the following reason. If a benevolent judge always makes decisions, courts will deviate because they know that they can reverse their decisions in the future by changing the precedent and moving the economy back to a Pareto superior outcome. In order to sustain the optimal outcome, there must be some probability that judges who are not benevolent will make decisions (on this point, see Section 6.2).

Usually in the literature, the above functional equation is solved numerically (see, for example, Klein, Krusell and Rios-Rull, 2004). The absence of a private state variable in our setup simplifies our task. The next proposition characterizes a Markov perfect equilibrium for the common law game.
Proposition 2: The following strategy profile is Markov perfect: conservative courts follow the precedent; when a benevolent judge decides, party A expects $p^{CL}$ and benevolent courts decide $p^{CL}$ for all $p$, where $p^{CL}$ is defined by

$$\frac{\delta \gamma}{(1 - \delta \gamma)} w'(p^{CL}, \Phi^C(p^{CL})) = 0.$$ 

The limit of $p^{CL}$ as $\delta \gamma \to 1$ is $p^*$. 

Proof: See the Appendix.

The above proposition states that the past precedent matters only if a conservative, who always upholds the precedent, handles the case. Benevolent judges, starting from any precedent, decide policy $p^{CL}$. This implies that $\Phi'(G(p')) = 0$, since party $A$, expecting that courts will follow the posited strategy profile, makes a constant investment for all $p \in [0, 1]$. As a result, the third term in the GEE is equal to zero. Then, the GEE has only one unknown, $p'$. This is so because (1) the investment in the first term does not depend on the current precedent $p$, but only on $p'$, (2) the investment rule $\Phi^C$ when a conservative decides depends only on the current precedent, which is equal to $p'$ in the next period.

Figure 5 displays graphically the dynamics in the common law: the arrows start from the current precedent and point to the new judicial decision of a benevolent judge.

The previous section showed that $\gamma = 0$ is preferable to $\gamma \in (0, 1)$ in the civil law. On the contrary, having a high ratio of conservative judges helps in sustaining the optimal outcome in the common law, because it prolongs the cost of a deviation from the ex ante optimal decision. However, if most judges are conservative, it takes more time to reverse a “bad” precedent. If we start with a precedent different from $p^{CL}$, it takes (in average) $\frac{1}{1 - \gamma}$ periods to change the precedent. In fact, $\frac{1}{1 - \gamma}$ is the expected number of periods necessary to observe a success (i.e., a benevolent court decides) in a geometric distribution, when the probability of success is $1 - \gamma$.\footnote{Some may object that, because of the transition cost associated with a large $\gamma$, having more conservative judges may not be beneficial in the common law. Suppose, for instance, that some feasible precedents are highly inefficient. Then, in expected value, the risk of starting with such precedents may offset the long run benefit of having a large $\gamma$. We reply to this objection by saying that conservative judges do not apply the past precedent for the sake of it, but because they defer to previous rulings. Therefore, we may think that at time zero all judges are benevolent, since there is no previous ruling to base the current decision on.}
Notice that common law courts eventually treat equal people equally. A constant steady state is reached as soon as a benevolent court makes a decision; from that time on, decisions will be constant, even when there are heterogenous courts. Compared to the civil law, the common law reduces the ex ante uncertainty associated with the decisions of the courts.

The welfare comparison between the two legal traditions depends on $\delta$, $\varepsilon$, and $\gamma$. In the common law, welfare increases in $\delta$ and $\gamma$. In the civil law, welfare decreases in $\varepsilon$ and is a non-monotone function of $\gamma$. The choice of the legal system that maximizes the utilitarian welfare function of the society is ultimately a quantitative matter. *Ceteris paribus*, if judges lack accountability (a large $\varepsilon$), the common law is preferable. A large fraction of activist judges (a low $\gamma$) makes the civil law a superior institution (if $\varepsilon$ is not too large). This paper, then, provides a rationale why countries adopt different legal systems.\(^{35}\)

The importance of the rule of precedent in explaining both overall financial development and firm financial obstacles has been emphasized by Beck et al. (2003a, 2005). The authors argue that the degree to which judicial decisions are a source of law is more crucial than judicial independence in explaining cross-country differences along those two dimensions. In their views, this is so because case law is more adaptable than statutory law. This paper, by pointing out the disciplinary role of *stare decisis*, provides a different explanation for these findings.

### 6.1 An Example

An example with a discrete choice space explains our result. Figure 6 shows the payoff in the stage game. First, party A chooses $e$, then the court decides. We have two possible precedents: $p \in \{ \overline{p}, \underline{p} \}$, where $\overline{p} < \underline{p}$ and two investment levels $e \in \{ \overline{e}, \underline{e} \}$, where $\overline{e} > \underline{e}$. The optimal outcome $(\overline{e}, \overline{p})$ cannot be sustained in a one-shot game. In fact, a benevolent court has a dominant strategy to play $\overline{p}$ irrespective of what $A$ has chosen; if so, party $A$ chooses $\overline{e}$.

\(^{35}\)The issue of the endogeneity of the legal system has been dealt with, for example, by Glaeser and Shleifer (2002).
We now consider the dynamic game where the precedent is a state variable. Strategies are defined by

\[ G : \{e, \bar{e}\} \times \{p, \bar{p}\} \to \{p, \bar{p}\}, \]

\[ \Phi : \{p, \bar{p}\} \to \{e, \bar{e}\}. \]

We show that \((e, p)\) can be sustained by a MPE when \(\gamma \delta\) is sufficiently large. We posit the following strategy profile \(S^*\):

\[
\begin{align*}
\Phi(p) &= e, \quad \Phi(\bar{p}) = \bar{e}, \quad \Phi^C(p) = e, \quad \Phi^C(\bar{p}) = \bar{e}; \\
G(p, e) &= p, \quad G(p, \bar{e}) = \bar{p}, \quad G(\bar{p}, e) = p, \quad G(\bar{p}, \bar{e}) = \bar{p}.
\end{align*}
\]

In other words, if a benevolent judge is handling the case, party A always chooses the high investment \(\bar{e}\) and the court decides \(\bar{p}\). Instead, conservative judges always confirm the precedent. We argue that there are no profitable one-shot deviations from the posited strategy profile. After a one-shot deviation, we will suppose that players keep following \(S^*\).

Courts are tempted to deviate by implementing \(p\) when party A expected \(\bar{p}\). The cost of such a deviation is that future conservative judges will keep \(p\). As soon as a benevolent judge makes a decision, \(\bar{p}\) is decided. The expected continuation utility of deviating to \(p\) is then:

\[
V(\gamma) = \gamma + 3(1 - \gamma) + \delta \gamma^2 + \delta \gamma \left[ 2(1 - \gamma) \gamma + (1 - \gamma)^2 \right] + \ldots = \frac{3}{1 - \delta} - \gamma - \frac{2}{1 - \gamma \delta},
\]

which decreases in \(\gamma\). To make a deviation to \(p\) unprofitable, we need that

\[
4 + \delta V(\gamma) \leq \frac{3}{1 - \delta}.
\]

After solving the above inequality, we find that deviations to \(p\) are not profitable if \(\gamma \delta \geq \frac{1}{3}\). Notice that a large discount factor is necessary, but not sufficient without a large \(\gamma\).

### 6.2 Homogenous Judges (\(\gamma = 0\))

This section argues that the rule of precedent by itself does not discipline courts’ behavior in a Markov environment when judges are homogenous.

As discussed earlier, if \(\gamma = 0\) the strategy profile \(S^*\) cannot by sustained by a MPE. We look for a different strategy profile to sustain \((p, \bar{e})\). With history dependent strategies, \((p, \bar{e})\) is usually sustained by the threat of permanently staying with the outcome \((p, \bar{e})\) after a deviation. This would be equivalent to the following Markov strategy profile, denoted by \(S^{**}\):

\[
\begin{align*}
\Phi(p) &= e, \quad \Phi(\bar{p}) = \bar{e}, \quad G(p, e) = p, G(\bar{p}, e) = \bar{p}, \quad G(p, \bar{e}) = \bar{p}, G(\bar{p}, \bar{e}) = p.
\end{align*}
\]
The above strategy profile posits that the outcome \((\overline{p}, \overline{e})\) is sustained only if \(\overline{p}\) is the precedent, while courts decide \(p\) if the current precedent is \(\overline{p}\). Is \(S^{**}\) Markov perfect, at least for sufficiently large \(\delta\)? The answer is negative for any \(\delta \neq \frac{1}{3}\).

First, we show that the threat of holding \(\overline{p}\) when \(\overline{p}\) is the current precedent is not credible when \(\overline{p}\) is large. In fact, notice that \(\Phi(\overline{p}) = e\) is not a perfect strategy when \(\delta > \frac{1}{3}\). Given that \(A\)'s utility is increasing in \(p'\), party \(A\) would deviate and play \(\overline{e}\), knowing that the court, when \(\delta > \frac{1}{3}\), will permanently move the precedent to \(\overline{p}\) after \(A\)'s deviation. As a result, \(S^{**}\) is not sustained by a MPE for \(\delta > \frac{1}{3}\).

Second, we argue that for small discount factors this threat, although credible, is not sufficient to discipline the court. In fact, the decision \(G(\overline{p}, e) = \overline{p}\) is not perfect when \(\delta < \frac{1}{3}\).

### 6.3 Prospective Overruling

A recent jurisprudential practice introduced “prospective overruling.”

**Definition 2:** Prospective overruling allows the court to uphold the existing precedent in the current case but declare it overruled for the future.

We claim that prospective overruling favors dynamic inconsistency problems, because it makes it impossible to move in equilibrium from \(e\) to \(\overline{p}\). Suppose the contrary. Then, given that \(\overline{p}\) is expected, party \(A\) chooses \(\overline{e}\). In this case, courts could balance utilities, deviate ex post by choosing \(p\), and announce that \(\overline{p}\) must be followed in the future. This deviation does not have any cost in the long run. As a result, if \(p\) is the current precedent, we cannot move to \(\overline{p}\) in equilibrium and the strategy profile \(S^*\) cannot be an equilibrium. One can verify that the only outcome that can be sustained by a MPE is \((p, e)\): that is, courts will decide \(p\) starting from any precedent.

Prospective overruling has been attacked by some justices. According to Justice Scalia, “prospective decision-making was ... born out of disregard for *stare decisis.*” Justice Harlan stressed that judicial decisions ought to be fully retroactive and argued that prospective overruling tends “to cut [the courts] loose from the force of precedent, allowing [them] to restructure artificially those expectations legitimately created by extant law and thereby mitigate the practical force of *stare decisis.*”

### 7 Adaptability in the Two Legal Systems

Benjamin Cardozo argued that the common law allows for a perfect mix between change and continuity. Referring to the role of the judge, he famously wrote: “Justice is not to be taken by storm. She is to be...”

This section explores this issue and analyses how the two legal traditions react to evolving economic conditions.

We suppose that the optimal $p^*$ changes over time because of shocks affecting the cost function of party $A$. With regard to the civil law, we distinguish between aggregate shocks (AS) and idiosyncratic shocks (IS). Aggregate shocks are shocks that are observed by the legislature before making the law. Idiosyncratic shocks are shocks that can be dealt with only in courts, because they are not observed by the legislature. We consider the two shocks separately: either the economy is hit by IS or by AS. Both shocks enter the utility of party $A$ in the following way:

$$u_A = h(p^*, e) - z^k c(e),$$

with $k = A, I$. Shocks are distributed according to a discrete Markov chain: $z^k \in \{z^k_1, z^k_2\}$, with $0 < z^k_1 < z^k_2$. Let $\pi_{ji}^k = \text{prob}(z^k_j | z^k_i)$ and $\sum_{j=1}^{2} \pi_{ji}^k = 1$, with $j, i = 1, 2$.

Let $p^*_i$ denote the optimal state-contingent policy when shock $i$ occurs, with $i = 1, 2$. Lemma 2 states that the ex post decision rule increases with $e$. To insure that the optimal decision rule also increases in $e$, we must assume that $\theta h_1(p^*, e) + \Phi'(p^*) (1 - \theta) f'(e)$ is increasing in $e$. If this is so, given that the investment rule shifts down when a large cost shock occurs, we conclude that $p^*_2 < p^*_1$.

An important remark is in order. In this section, we suppose that the decision space of the judge and of the legislature is still $[0, 1]$. This amounts to saying that (1) legislatures cannot write norms that are contingent on the occurring shock and (2) common law courts cannot distinguish precedent and make a decision that is conditional on the current shock. We justify this assumption by assuming that these shocks are difficult to describe in advance, even if their consequences and probabilities are known by all players. Note that we are not claiming that in the real world all shocks are undescribable and that courts cannot distinguish cases. We focus on undescribable shocks because, if courts were facing describable shocks, this section would have nothing new to add (the analysis here would be identical to the one in the previous sections, after we define the decision space as $[0, 1] \times \{z_1, z_2\}$) and our model would not be able to explain inertia in judicial decision making.

7.1 The Civil Law System

Legislatures always adjust the law after an aggregate shock. But, the adjustment will not be optimal, because, as we saw in Section 5, legislatures never implement the optimal outcome when $\gamma \in (0, 1)$. Depending on the judge who is handling the case, the final decision is below (if a benevolent judge decides) or above (if a conservative judge decides) the optimal decision $p^*_i$.

---

38 Cardozo (1924), at p. 133.
39 The notion of “undescribable events” has been advanced by Al-Najjar et al. (2004).
Regarding idiosyncratic shocks, the civil law is clearly deficient in facing those shocks, since civil law courts have less leeway and because the law must be thought of in the abstract. However, knowing that IS will occur, the legislature will write the law accordingly. At the first stage, it faces a double uncertainty with respect to (1) which judge will handle the case and (2) which shock will occur. We define the optimal law by

\[
l^*_i = \arg \max_{l \in [0,1]} \sum_{j=1,2} \pi_{ji} \left[ (1 - \gamma)w \left( G(l, \Phi(l, z'_j), z_j), \Phi(l, z'_j), z_j \right) + \gamma w \left( l, \Phi_C(l, z'_j), z_j \right) \right],
\]

where \( i = 1, 2 \) denotes the previous idiosyncratic shock, which we must know to select the transition probabilities. As before, legislatures place the law at a higher level that the expected optimal policy. Presumably, the law will be set between \( p^*_2 \) and \( p^*_1 \). This means that we will observe more credibility problems when \( z'_1 \) occurs, simply because the legislature gives courts more leeway in dealing with the occurrence of \( z'_1 \). After an IS, conservative courts decide \( l^*_i \) (see Figure 7). Benevolent courts decide \( l^*_i - \varepsilon \) when \( z'_2 \) occurs; when \( z'_1 \) occurs, assuming that the constraint imposed by the written norms does not bind, courts make a decision belonging to the interval \( (l^*_i - \varepsilon, l^*_i + \varepsilon) \). Notice that this section presents another variant of the classic trade-off between commitment and flexibility. When \( \varepsilon \) is small, credibility problems are less severe, but the civil law does not perform well in responding to the idiosyncratic shock \( z'_2 \).

### 7.2 The Common Law System

In the common law, the analysis is identical for aggregate and idiosyncratic shocks, since both shocks are observed by judges prior to making a decision. A strategy for a benevolent judge is represented by the function \( G : [0, 1] \times \mathcal{E} \times \{z_1, z_2\} \rightarrow [0, 1] \). When shock \( z_i \) occurs, with \( i = 1, 2 \), the Bellman equation becomes:

\[
V(p, e, z_i) = \max_{p' \in [0,1]} \left\{ w(p', e, z_i) + \delta \sum_{j=1,2} \pi_{ji} \left[ (1 - \gamma)V(p', \Phi(p', z_j), z_j) + \gamma V_C(p', \Phi_C(p', z_j), z_j) \right] \right\}.
\]
For the sake of simplicity, we will denote $V^C(p, \Phi^C(p, z_i), z_i)$ and $w(p, \Phi^C(p, z_i), z_i)$ by, respectively, $V^C(z_i)$ and $w(z_i)$. After some algebra, for any $i = 1, 2$ and $j \neq i$, we obtain

$$V^C(z_i) = \frac{[w(z_i) + \delta \pi_{ji}(1 - \gamma)V(z_j) + \delta \pi_{ii}(1 - \gamma)V(z_i)](1 - \delta \gamma \pi_{jj})}{(1 - \gamma \delta \pi_{jj})(1 - \gamma \delta \pi_{ii}) - \gamma^2 \delta^2 \pi_{ij} \pi_{ji}} + \frac{\delta \gamma \pi_{ji}[w(z_j) + \delta \pi_{jj}(1 - \gamma)V(z_j) + \delta \pi_{ij}(1 - \gamma)V(z_i)]}{(1 - \gamma \delta \pi_{jj})(1 - \gamma \delta \pi_{ii}) - \gamma^2 \delta^2 \pi_{ij} \pi_{ji}}.$$ 

As before, we derive the Euler equation of a benevolent judge. Assuming that the stochastic steady state is reached from any precedent, the GEE when $z_1$ occurs simplifies to

$$[\theta h'_i(p', e, z_1) + (1 - \theta) v'(p')] + \frac{\delta \gamma \pi_{21}(1 - \gamma \delta \pi_{11}) + \delta^2 \gamma^2 \pi_{11} \pi_{21}}{(1 - \gamma \delta \pi_{11})(1 - \gamma \delta \pi_{22}) - \delta^2 \gamma^2 \pi_{21} \pi_{12}}w'(p', \Phi^C(p', z_2), z_2)$$

$$+ \frac{\delta^2 \gamma^2 \pi_{21} \pi_{12} + \delta \gamma \pi_{11}(1 - \gamma \delta \pi_{22})}{(1 - \gamma \delta \pi_{11})(1 - \gamma \delta \pi_{22}) - \delta^2 \gamma^2 \pi_{21} \pi_{12}}w'(p', \Phi^C(p', z_1), z_1) = 0. \tag{5}$$

The GEE when $z_2$ occurs is symmetric.

### 7.2.1 Adaptability without Credibility Problems

As a benchmark, we modify our model by supposing that there are no externalities: that is,

$$u_B(p', e) = v(p').$$

If this is the case, there are no credibility problems. If the model were deterministic, both the common law and the civil law would implement the optimal decision. Instead, if there is uncertainty about the optimal decision, we will argue that the common law does not implement the optimal outcome even without credibility problems.

**Proposition 3:** Let $\gamma = 0$ or $\pi_{ii} = 1$, with $i = 1, 2$. Then $G(p, \Phi(p, z_i), z_i) = p_i^*$. Suppose instead that $\gamma \in (0, 1)$ and $\pi_{ii} < 1$, with $i = 1, 2$. Then $G(p, \Phi(p, z_i), z_i) \in (p_2^*, p_1^*)$.

**Proof:** See the Appendix.

In other words, in the common law benevolent courts innovate cautiously; conservative courts do not innovate at all. The underlying intuition for this result is the following. Changing the precedent after a shock is costly because, if a conservative judge handles the case in the future, the previous precedent will be confirmed, even if it was intended for a different shock. Furthermore, when the persistence of each shock is high, courts are less cautious in changing the precedent. In the civil law, this prudence is not necessary, since current decisions have no effect on how future legislatures will set the law. Supporters of the common law would probably argue that the civil law is also slow to adjust because of legislative
inertia.\textsuperscript{40} In our setup, we abstract from these issues, since we do not model the legislative process according to which statutes are written.

Notice that caution in adjusting to shocks is welfare decreasing: that is, keeping the same court’s decisions from tomorrow on, it is possible to raise welfare in the current period by making a different decision. This prudence in adapting to shocks depends on $\gamma$ and $\delta$. If $\gamma$ or $\delta$ are low, less caution is necessary, but Section 6 showed that credibility problems are more severe. The well-known trade-off between commitment and flexibility comes on the scene in the common law as well.

### 7.2.2 Adaptability and Credibility Problems

This section analyzes credibility problems in a model with uncertainty. The utility of party $B$ is again $u_B(p', e) = v(p') + f(e)$. We show that there is an \textit{asymmetry} in the severity of credibility problems after different shocks. The temptation to deviate from the ex ante optimal policy depends on which shock occurred. When $z_2$ occurs, benevolent courts are much more restrained. In a sense, courts choose the “right” timing (that is, the occurrence of the “right” shock $z_1$) to deviate. The underlying intuition is the following. In a model with time consistency problems and uncertainty, there are two forces that move away from the optimal policy: a caution effect, described in the previous section, and credibility problems. When $z_2$ occurs, these two forces go in opposite directions. On the one side, courts want to lower $p'$ compared to $p^*_2$ because of credibility problems. On the other side, as Proposition 3 states, prudence in adjusting to shock pushes $p'$ in the opposite direction. When $z_1$ occurs, we obtain the opposite conclusion. Both the caution effect and credibility problems aggravate dynamic inconsistency problems, since they encourage decisions below $p^*_1$.

We posit an equilibrium strategy where, when benevolent judges decide, the economy reaches a stochastic steady state, denoted by $(p^{CL}_1, p^{CL}_2)$, starting from any precedent. Conservative judges, instead, do not react to shocks (see Figure 8).

Moreover, we will normalize one shock to compare the solution when there is uncertainty with the solution of the model without uncertainty. Suppose that $z_2 = 1$. The common law game in Section 6 can be thought of as a special case of the game with uncertainty when $z_2 = 1$ and $\pi_{22} = 1$: in this case, $p^{CL}_2 = p^{CL}$. However, when $\pi_{22} < 1$, the two solutions will be different, since the possibility that $z_1$ may occur in the future changes the payoff in the continuation game following a deviation. As discussed earlier, credibility problems will be \textit{less} severe than in Section 6: that is, $p^{CL}_2 > p^{CL}$.

**Proposition 4:** The following strategy profile is Markov perfect. If the current precedent is any $p \in [0, 1]$ and $z_2$ occurs, party A expects $p^{CL}_2$ and benevolent courts decide $p^{CL}_2$. If the current prece-

\textsuperscript{40} There are many reasons why legislatures delay reforms: for example, Alesina and Drazen (1991), and Fernandez and Rodrik (1991).
Figure 8: Precedent Dynamics after $z_2$ (picture above) and after $z_1$ (picture below)

If $p \in [0, 1]$ and $z_1$ occurs, party $A$ expects $p_{1}^{CL}$ and benevolent courts decide $p_{1}^{CL}$. Conservative courts always follow the precedent. The decision $p_{1}^{CL}$ is defined implicitly from condition (5). Decision $p_{2}^{CL}$ is defined in a symmetric way. Let $\pi_{11} < 1$ and normalize $z_1$ to 1. Then $p_{1}^{CL} < p^{CL}$. Suppose instead that $z_2 = 1$ and $\pi_{22} < 1$. Then $p_{2}^{CL} > p^{CL}$.

**Proof:** See the Appendix.

The persistence of the shock affects the location of $p_{1}^{CL}$ and $p_{2}^{CL}$. If the persistence is high, $p_{1}^{CL}$ and $p_{2}^{CL}$ move away from each other, since the caution effect, which brings them closer, does not play a big role. Conversely, when the persistence is low, courts decisions are more uniform.

Briefly, we summarize how the two legal systems adapt to changing economic conditions.

Consider a model with uncertainty, but without credibility problems. The civil law implements the optimal decision under AS, but not under IS; the capacity of responding to IS increases with $\varepsilon$. The common law is too cautious in changing the precedent. Common law courts are less prudent if shocks are persistent.

Consider now a model with uncertainty and credibility problems. The civil law does not implement the optimal decision under both AS and IS. With respect to IS, there is a trade-off between commitment (that calls for a small $\varepsilon$) and flexibility (that requires a large $\varepsilon$). If $\varepsilon$ were a choice variable - which is not the case here - there would exist an optimal $\varepsilon$ that makes a trade-off between commitment and flexibility. With respect to AS, such a trade-off does not arise.

In the common law, the equilibrium outcome depends on $\delta, \gamma$, and on the transition probabilities. When a benevolent judge decides, the common law adapts instantaneously to IS. If these shocks are persistent (and $\gamma \delta$ is large) the common law is a better system than the civil law, since courts are less prudent in changing the precedent and, consequently, they adapt optimally. Courts’ caution depend positively on $\delta$ and $\gamma$, but note that $\delta$ and $\gamma$ also affect the incentives to deviate from the ex-ante optimal
decision. As a result, increasing $\delta \gamma$ does not have a straightforward implication on the efficiency of the common law; again, there exists a trade-off between commitment and flexibility.

8 Conclusions

This paper sets up a (stylized) model to analyze judicial decision making. We suppose that courts lack commitment in enforcing the law. We compare courts' decisions under the common and the civil law. Our model is able to generate different economic implications under the two legal systems without assuming differences in preferences between judges and legislatures. We summarize our results.

- In the civil law, written norms constrain courts' decision making. The law is set by the legislature in a strategic way to offset the incentives of the courts to deviate ex post. In many cases, the law is set at a higher level than the ex ante optimum, so that the ex post decision is closer to the optimum. Since legislatures face heterogenous judges and cannot tailor the code to particular judges, civil law courts' do not treat people equally. Given the same code, some judges interpret the law literally, others reoptimize ex post.

- The rule of precedent plays a disciplinary role in the common law. The threat that conservative judges in the future will apply the precedent literally (almost) sustains the ex ante optimal policy, despite the degree of discretion that courts enjoy. Moreover, eventually common law courts always implement the same decision, which reduces the ex ante uncertainty of the two parties.

- Regarding the degree of adaptability of the two legal systems, we consider two cases: with and without credibility problems. Absent credibility problems, we show that common law courts innovate more cautiously compared to the civil law because of the rule of precedent. Courts are more cautious in changing the precedent when facing a shock because they are afraid that in the next period - when a new shock occurs - this new precedent may not be justified. In a model where credibility problems matter, this caution interacts with the incentives to deviate from the (state-contingent) optimal decision. We argue that credibility problems are more severe under some shocks than under others as a result of this interaction.

This paper argues that it does not exist a clear answer to the question of which is the most efficient legal system.\(^{41}\) The answer depends on the type of uncertainty, on the composition of the judiciary, and on the extent of judicial independence. This is probably the reason why legal systems continuously

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\(^{41}\) Along these lines, commenting on the role of institutions for economic development, Tabellini (2005) argues that “we should not take it for granted that there exist institutional blueprints that work well in all economic and social environments.”
evolve over time. The U.S. legal system is no exception. As pointed out by Calabresi in 1982: “The last fifty to eighty years have seen a fundamental change in American law. In this time we have gone from a legal system dominated by the common law, divined by courts, to one in which statutes, enacted by legislatures, have become the primary source of law. The consequences of this [change] are just beginning to be recognized.” In Calabresi’s opinion, the turning point coincided with the New Deal: “The slow, unsystematic, and organic quality of common law change made it clearly unsuitable to many legal demands of the welfare states.”42

To better address these issues, one should model in a more realistic way the political decision process. In the common law, an important share of legislative power has been implicitly delegated to courts by majoritarian bodies (and we provided a rationale for why this might have happened). Any adjustment to the judicial-legislative balance, then, is up to the society. As a further step toward realism, the assumption that judges and legislatures maximize an utilitarian objective function should be abandoned. For now, we leave this venture to future research.

42 Calabresi (1982), at pp. 1-5. More recently, Ferejohn (2002) sees a shift in lawmaking power away from legislatures and a rise of the centrality of courts.
References


APPENDIX

Proof of Lemma 1: By contradiction, suppose that \( \bar{\Phi}(p') \) is decreasing on \([0, 1]\). Then, there exists \( p'_1, p'_2 \in [0, 1] \) with \( p'_1 < p'_2 \) such that \( \bar{\Phi}(p'_2) \leq \bar{\Phi}(p'_1) \). Using the first-order condition (2), and recalling (on order) that \( c' \) is increasing, \( h''_{12} > 0 \), and \( h''_{22} < 0 \), we obtain

\[
h'_2(p'_2, \bar{\Phi}(p'_2)) = c'(\bar{\Phi}(p'_2)) \leq c'(\bar{\Phi}(p'_1)) = h'_2(p'_1, \bar{\Phi}(p'_1)) < h'_2(p'_2, \bar{\Phi}(p'_1)) \leq h'_2(p'_2, \bar{\Phi}(p'_2)).
\]

This conclusion is obviously false. \( \square \)

Proof of Lemma 2: Suppose instead that \( p^{nc}(e) \) is decreasing on \( \mathcal{E} \). If this is so, there exists \( e, e' \in [0, 1] \) with \( e < e' \) such that \( p^{nc}(e') \leq p^{nc}(e) \). Recalling that \( -v' \) is increasing, \( h''_{12} > 0 \), \( h''_{22} < 0 \), and using the first-order condition (3b), one obtains

\[
\theta h'_1(p^{nc}(e), e) = - (1 - \theta) v'(p^{nc}(e)) \geq - (1 - \theta) v'(p^{nc}(e'))
\]

\[
= \theta h'_1(p^{nc}(e'), e') > \theta h'_1(p^{nc}(e'), e) \geq \theta h'_1(p^{nc}(e), e).
\]

The above inequalities bring us to a contradiction. \( \square \)

Proof of Proposition 1:

Step 1 We show that \( p^* \) can be implemented when \( \gamma = 0, 1 \).

Let \( \gamma = 0 \). Recalling that \( e^* \) denotes the optimal investment when \( p^* \) is expected, we must show that \( G(p^* + \varepsilon, e^*) = p^* \).

Suppose that at the second stage Party A makes investment \( e^* \). Recall that the ex post utility of the judge is strictly concave in \( p' \) and has an interior maximum at \( p^{nc}(e^*) < p^* \). Thus, we obtain

\[
l + \varepsilon \quad \text{if } l \leq p^{nc}(e^*) - \varepsilon,
\]

\[
G(l, e^*) = p^{nc}(e^*) \quad \text{if } p^{nc}(e^*) - \varepsilon < l < p^{nc}(e^*) + \varepsilon,
\]

\[
l - \varepsilon \quad \text{if } l \geq p^{nc}(e^*) + \varepsilon.
\]

If the law is equal to \( p^* + \varepsilon \), which we know to be greater than \( p^{nc}(e^*) \), the constraint imposed by the legislature is binding and courts choose \( p^* \). Consequently, \( l^* = p^* + \varepsilon \) is optimal and \( e^* \) is the optimal investment. When \( \gamma = 1 \), the legislature trivially implements \( p^* \) by choosing \( l^* = p^* \).

Step 2 We show that \( p^* \) is never implemented by the civil law.
To begin with, we argue that it is never optimal to set the law in the interval \([0, p^*]\) because it aggravates credibility problems when a benevolent judge decides and imposes a suboptimal law to a conservative judge. Equally, a law in the interval \((p^* + \varepsilon, 1]\) is never optimal, since, for instance, the law \(l = p^* + \varepsilon\) dominates any policy in that interval.

We now show that \(p^*\) is never implemented by the civil law when \(\gamma \in (0, 1)\) and \(\varepsilon > 0\). Suppose the contrary. There are only two ways of implementing \(p^*\). First, by setting \(l = p^*\): in such a case the good decision is implemented when a conservative court decides. The other possibility is to set \(l = p^* + \varepsilon\); then \(p^*\) is implemented when a benevolent judge decides. However, we will argue that both codes are never optimal if \(\gamma \in (0, 1)\). The expected utility of the legislature is

\[
(1 - \gamma)w \left( G(l, \Phi(l)), \Phi(l) \right) + \gamma w \left( l, \Phi^C(l) \right). \tag{A1}
\]

A remark is in order before proceeding. Notice that \(G(l, \Phi(l))\) is not differentiable on the entire domain. However, we have shown that \(l^*\) will belong to \([p^*, p^* + \varepsilon]\); on that interval, \(G(l, \Phi(l)) = l - \varepsilon\). The investment rule \(\Phi(l)\) is also differentiable on \([p^*, p^* + \varepsilon]\). Thus, for all \(l \in [p^*, p^* + \varepsilon]\) we can rewrite (A1) as

\[
(1 - \gamma)w \left( l - \varepsilon, \Phi(l - \varepsilon) \right) + \gamma w \left( l, \Phi^C(l) \right). \tag{A2}
\]

Assuming an interior solution, differentiate (A2) to solve for \(l^*\).

Evaluating the derivative at \(l = p^* + \varepsilon\) and \(l = p^*\), and exploiting the fact that the function \(w\) is strictly concave on \([p^*, p^* + \varepsilon]\), one obtains, respectively, a negative and positive value. Then, there exists a \(l^* \in (p^*, p^* + \varepsilon)\) that satisfies the first order condition of the legislator’s problem. \(\square\)

**Proof of Corollary 1:**

*Step 1* We show that the indirect utility of the legislator is non-monotone in \(\gamma\).

To make explicit the dependence of \(l^*\) and \(G(l, \varepsilon)\) on \(\gamma\) and \(\varepsilon\), the optimal law is denoted by \(l^*(\gamma, \varepsilon)\) and the decision rule by \(G(l, \varepsilon)\). The indirect utility of the legislature is

\[
V(\gamma, \varepsilon) = \gamma w \left( l^*(\gamma, \varepsilon), \Phi^C(l^*(\gamma, \varepsilon)) \right) + (1 - \gamma)w(G(l^*(\gamma, \varepsilon), \Phi(l^*(\gamma, \varepsilon)); \varepsilon), \Phi(G(., .))).
\]

The expression above reaches a maximum at the corners \(\gamma = 0, 1\). After differentiating \(V(\gamma, \varepsilon)\) with respect to \(\gamma\), we see that the derivative is equal to

\[
V'_1(\gamma, \varepsilon) = w \left( l^*(\gamma, \varepsilon), \Phi^C(l^*(\gamma, \varepsilon)) \right) - w(G(l^*(\gamma, \varepsilon), \Phi(l^*(\gamma, \varepsilon)); \varepsilon), \Phi(G(., .))). \tag{A3}
\]

When \(\gamma = 0\), \(l^*(\gamma, \varepsilon) = p^*\) for all \(\varepsilon\). The derivative (A3) becomes \(w \left( p^* + \varepsilon, \Phi^C(p^* + \varepsilon) \right) - w(p^*, \varepsilon)\), which is negative by definition of \(p^*\). When \(\gamma = 1\), \(l^*(\gamma, \varepsilon) = p^*\) for all \(\varepsilon\); the derivative (A3) is now positive. This shows that \(V(\gamma, \varepsilon)\) depends non-monotonically on \(\gamma\).
Step 2 We show that \( L(\gamma, \varepsilon) \) is weakly increasing in \( \varepsilon \) and that the welfare loss of the civil law increases in \( \varepsilon \).

We rewrite \( w(\Phi_l^*(\gamma, \varepsilon), \Phi_l^*(\gamma, \varepsilon)), \Phi_l^*(\gamma, \varepsilon)) \) as a function of the decision of the court, that we know to be equal to \( l^*(\gamma, \varepsilon) - \varepsilon \) on the relevant domain. The first order condition of the legislature, evaluated at the optimum, is

\[
(1 - \gamma)w'(l^*(\gamma, \varepsilon) - \varepsilon) + \gamma w'(l^*(\gamma, \varepsilon)) = 0
\]

After differentiating, we obtain

\[
l^*_2(\gamma, \varepsilon) = \frac{(1 - \gamma)w''(l^*(\gamma, \varepsilon) - \varepsilon)}{(1 - \gamma)w''(l^*(\gamma, \varepsilon) - \varepsilon) + \gamma w''(l^*(\gamma, \varepsilon))}
\]

Thus, since \( w'' < 0 \), we conclude that \( 0 < l^*_2(\gamma, \varepsilon) < 1 \). This implies that a large \( \varepsilon \) reduces the expected utility of the legislature, since it increases the policy that is implemented in case a conservative judge decides (since \( l^*_2(\gamma, \varepsilon) > 0 \)), but reduces the policy (compared to \( p^* \)) when a benevolent judge decides: in fact, since \( l^*_2(\gamma, \varepsilon) < 1 \), for any \( \varepsilon' > \varepsilon \) we have \( l^*(\gamma, \varepsilon') - \varepsilon' < l^*(\gamma, \varepsilon) - \varepsilon < p^* \).

**Proof of Proposition 2:** To verify that the posited strategy profile is Markov perfect, we check that there are no one-shot deviations. This amounts to checking that the GEE is satisfied at \( p^{CL} \). Suppose that Party A expects \( p^{CL} \). After a one-shot deviation players are expected to follow the posited guess. According to our guess, on the equilibrium path the decision rule is constant. That is, starting from any precedent, a benevolent judge decides \( p^{CL} \). The investment is also constant when starting from any precedent. This implies that \( \Phi'(G(p')) = 0 \). Therefore, the third term of the GEE becomes zero. This is why, the GEE holds at \( p^{CL} \), since the equation that implicitly defines \( p^{CL} \) coincides with the GEE.

We now show that \( p^{CL} \to p^* \), as \( \delta \gamma \to 1 \). First, we show that \( p^{CL} \) is increasing in \( \delta \gamma \). By contradiction, suppose that \( p^{CL}(\delta \gamma) \) is decreasing. Then, there exists \( \delta \gamma, \delta' \gamma' \in [0, 1] \) with \( \delta \gamma < \delta' \gamma' \) such that \( p^{CL}(\delta' \gamma') \leq p^{CL}(\delta \gamma) \). Recalling that both the ex post and the ex ante utilities are strictly concave, and supposing that we are on the equilibrium path, we obtain

\[
\theta h'_1(p^{CL}(\delta' \gamma'), \Phi(p^{CL}(\delta' \gamma')) + (1 - \theta) v'(p^{CL}(\delta' \gamma')) = -\frac{\delta' \gamma'}{(1 - \delta \gamma')} w'(p^{CL}(\delta' \gamma'), \Phi(p^{CL}(\delta' \gamma'))) \leq
\]

\[
-\frac{\delta \gamma}{(1 - \delta \gamma)} w'(p^{CL}(\delta \gamma), \Phi(p^{CL}(\delta \gamma))) = \theta h'_1(p^{CL}(\delta \gamma), \Phi(p^{CL}(\delta \gamma)) + (1 - \theta) v'(p^{CL}(\delta \gamma)).
\]

The above inequalities contradict the strict concavity of the ex post utility of the judge. Notice that the Euler equation approaches \( w'(p^{CL}, \Phi(p^{CL})) = 0 \) when \( \gamma \delta \to 1 \). As a result, the limit of \( p^{CL} \) is \( p^* \).
Proof of Proposition 3: Suppose that \( z_1 \) occurs. We know that along the equilibrium path \( w'(p', \Phi(p', z_1), z_1) = w'(p, \Phi^C(p', z_1), z_1) \), since \( \Phi^C \) coincides with \( \Phi \) when there are no externalities. Let \( \gamma = 0 \) or \( \pi_{11} = 1 \). The first order condition (5) reduces to \( w'(p', \Phi^C(p', z_1), z_1) = 0 \). This is the same condition that characterizes the first best: courts implement \( p^*_1 \) when \( z_1 \) occurs. If \( \gamma \in (0, 1) \) and \( \pi_{11} < 1 \), we argue that common law judges innovate cautiously. By exploiting the strict concavity of the judge’s ex post utility, when \( p' = p^*_2 \) the left-hand side of (5) is positive. When \( p' = p^*_1 \) the left-hand side becomes negative. Thus, the optimal \( p' \) that satisfies equation (5) belongs to the interval \((p^*_2, p^*_1)\). The argument when \( z_2 \) occurs is identical. \( \square \)

Proof of Proposition 4: The argument that shows that the posited profile is Markov perfect is identical to the one in Proposition 2.

Suppose that \( z_1 \) occurs. We now show that \( p_1^{CL} < p^{CL} \) when \( \pi_{11} < 1 \) and \( z_1 = 1 \). (The argument when \( z_2 \) occurs is similar.) We compare the GEE that defines \( p^{CL} \) with equation (5) that defines \( p_1^{CL} \). For any given \( e \), the current marginal benefit of deviating (the first term) is identical in the two equations. The future cost of lowering \( p' \) below \( p^*_1 \) decreases when there is uncertainty. For two reasons. First, lowering \( p' \) ex post is beneficial when a conservative judge decides in the next periods and \( z_2 \) occurs. This is so because

\[
\begin{align*}
w'(p', \Phi^C(p', z_2), z_2) < 0 < w'(p', \Phi^C(p', z_1), z_1)
\end{align*}
\]

for all \( p^*_2 \leq p' \leq p^*_1 \). Second, it is less likely that a conservative judge holds the precedent under shock \( z_1 \). In fact,

\[
\frac{(\delta \gamma)^2 \pi_{21} \pi_{12} + \delta \gamma \pi_{11} (1 - \delta \gamma \pi_{22})}{(1 - \gamma \delta \pi_{11})(1 - \gamma \delta \pi_{22}) - \gamma^2 \delta^2 \pi_{21} \pi_{12}} < \frac{\delta \gamma}{(1 - \delta \gamma)}
\]

Therefore, we have that \( p_1^{CL} < p^{CL} \) since the marginal costs of lowering \( p' \) decrease compared to the model without uncertainty, while the marginal benefits increase. \( \square \)