

# Contingent judicial deference: theory and application to usury laws\*

Bernardo Guimaraes<sup>†</sup>      Bruno Meyerhof Salama<sup>‡</sup>

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## Abstract

Legislation is less likely to be enforced when courts disagree with it. Building on this premise, we propose a model of Bayesian adjudicators that use their own prior knowledge to evaluate the appropriateness of legislation. The model yields a non-monotonic relation between written rules and effectively enforced rules. Hence the enactment of legislation prohibiting something raises the probability that courts will allow related things not expressly forbidden. Moreover, legal uncertainty is greater with legislation that commands little deference from courts than with legislation that commands none. We discuss examples of effects of legislated prohibitions (and, in particular, usury laws) that are consistent with the model.

KEYWORDS: adjudication; courts; prohibitions; interest rate cap.

JEL CLASSIFICATION: K41, K22, K12, G21.

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<sup>†</sup>Sao Paulo School of Economics – FGV. Email: [bernardo.guimaraes@fgv.br](mailto:bernardo.guimaraes@fgv.br)

<sup>‡</sup>São Paulo School of Law – FGV and University of California, Berkeley. Email: [bruno.salama@fgv.br](mailto:bruno.salama@fgv.br).

# 1 Introduction

A simple truth about judicial systems is that courts exercise judgment about legislation and refrain from enforcing it when they deem it sufficiently unlikely to be appropriate. Unlike the proverbial sport umpire who merely calls balls and strikes, judges evaluate the “rules of the game” before applying them to concrete cases. Judicial deference to the legislator is therefore not automatic. We want to understand why that matters and then derive economic implications. Our starting point is that the legislation conveys information to courts about its own appropriateness. Each statute contains useful information for courts to decide whether to defer to the legislator or not. Hence the probability that a statute will be enforced in court is endogenous to the statute itself. This has non-trivial implications to the interaction between written legislation and court decisions. This paper proposes a model to study this issue.

In the model, Bayesian adjudicators are imperfectly informed about an issue. The legislation yields a clear implication, but it is not clear whether it has been appropriately designed.<sup>1</sup> Adjudicators use their prior knowledge to assess the legislation. Formally, they learn about the ‘type of legislator’. The largest the distance between the legislation and what an adjudicator would expect from a ‘good legislator’, the largest is the likelihood that the statute was enacted by a ‘bad legislator’. As a result, the legislation is discarded if it is sufficiently distant from the adjudicator’s prior beliefs.

In equilibrium, courts will often enforce legislation as intended by legislators even if it does not reflect the courts’ preferred policy choice; occasionally, however, courts will make a judgment call and overrule the legislator.<sup>2</sup> The paper highlights two key implications of the model, one related to the probability of statutory enforcement and the other concerning the effect of legislation on legal uncertainty.

The first implication can be stated as follows: the enactment of legislation specifying that parties cannot do something raises the probability that courts will allow related things not expressly forbidden. In simple words, the enactment of a prohibition can in practice create a permission. We use usury laws to illustrate this insight. A statutory interest rate ceiling not only makes it more likely that courts will invalidate contracts with interest rates above the cap, but it can also make it more likely that courts will validate contracts with interest rates below the legislated cap.

Intuitively, it goes like this. Absent usury laws, very high interest rates are not prohib-

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<sup>1</sup>We are thus assuming away the problem of statutory ambiguity, a legal scholars’ favorite that is however not our concern here.

<sup>2</sup>We realize that courts almost always speak in terms of deference even when they are failing to do so, but we are concerned with the substance rather than the rhetoric of court decisions.

ited. However, if courts deem a contract with interest rates of, say, 1000% “unconscionable”, the absence of an interest rate cap will be considered inappropriate. Courts would then define an interest rate cap at, say, 40%. Now, contrast this situation with one where Congress enacted a statute capping interest rates at 50%. If the court’s best judgment is that the appropriate interest rate cap is 40%, a legislated cap of 50% raises little disagreement (whereas the absence of any ceiling generates a much greater level of disagreement). In other words, courts attribute a larger probability to the legislation being ‘good’. Hence the same court that would impose a 40% interest rate if legislation allowed any interest rate, would uphold the legislated 50% interest rate cap.

Notice the surprising outcome. In both cases, legislation permits the 45% contract (in the first case because there is no legislated cap and in the second because the cap is set at 50%). Yet, with no ceiling, courts invalidate the 45% contract whereas with a 50% ceiling, courts validate it. As such, a 45% interest rate contract, while legislatively permitted in both scenarios, would only be deemed valid where there is a legislated cap of 50%. As can be seen, the existence of a ceiling changes how courts regulate transactions that are not expressly forbidden. This is how the enactment of a statutory prohibition can create a court permission.

The economic implication is that carefully crafted usury laws can cause credit markets to expand, rather than retract. By increasing the court’s tolerance for higher levels of interest rates, a legislated ceiling would sway judges into permitting more loans, leading credit markets to expand.

Just like a statutory prohibition can raise the probability that courts permit things that are not statutorily prohibited (such as contracting with higher interest rates), the enactment of legislation permitting something may raise the probability that judges will prohibit related things not expressly permitted. To go back to the same example, in the presence of a legislated interest rate ceiling of 3% (too low) courts will probably overrule the legislator and apply their best judgment so as to place the threshold at 40%. But suppose the legislature replaces the 3% with a 35% interest cap, a generous legislative permission. Now the legislated cap raises much less disagreement and is strictly enforced by courts. The interest rates tolerated by courts, however, paradoxically drop from 40% to 35%. So while the new usury law expressly extended the permission for parties to contract interest rates in the range of 3-35%, its actual effect was to prohibit contracts in the range of 35-40%. Here, the enactment of a permission in practice created a prohibition. These results can be visualized in Figure 1.

The model is first employed to study usury laws, but our conclusions apply beyond that,

Legislated ceiling	Prevailing ceiling	<b>Permitting prohibition</b>	
None	40%	Legislated ceiling	Prevailing ceiling
		50% (down)	50% (up)

Legislated ceiling	Prevailing ceiling	<b>Prohibiting permission</b>	
3%	40%	Legislated ceiling	Prevailing ceiling
		35% (up)	35% (down)

Figure 1: Permitting prohibition and prohibiting permission

as discussed and exemplified later.

The second insight from the model is that the dispersion of court decisions tends to be greater with legislation that commands little deference from courts, than with legislation that commands none. Technically, this means that the relationship between the variance of decisions and some measure of the degree of disagreement of the median judge with the legislation is non-monotonic. Assuming that greater judicial dereference is a proxy for better legislation, the implication is that within a certain range, legislative improvement trades-off with legal certainty.

To grasp the intuition, contrast these two situations. First, an interest rate cap is legislated at a completely unreasonable level. For example, it is too low (3%) or too high (3000%). In either of these cases, all courts will reject the legislation (the likelihood that the legislation is appropriate will be considered too low). Thus the ceiling will be ignored (say, a very low ceiling is deemed an unconstitutional interference with the freedom of contract; a very high ceiling permits too many unconscionable loans). As such, courts validate contracts with interest rates above the unreasonably low legislated cap, or invalidate contracts with interest rates below the unreasonably high interest rate legislated cap. Either way, the legislator is overruled and a court-imposed interest rate cap arises as a byproduct of the court decisions. This cap is dispersed (say between 25% and 250%).

In the alternative scenario, the cap is legislated at a point deemed unreasonable by the majority of judges, but not by all. For example, the legislated cap is either “very low” (15%) or “very high” (300%), so some courts uphold these caps but most of them are deciding according to their own judgment calls. Crucially, courts that uphold the 15% interest rate ceiling are those that would otherwise choose a ceiling close to 25%; those which would choose a higher ceiling would consider the 15% cap inappropriate.

As a result, compared to a situation with a 3% interest rate ceiling, the 15% cap raises legal uncertainty because a credit contract with a 20% interest rate is subject to legal uncertainty in the latter case (some courts uphold the 15% ceiling) but not in the former

case (all courts ignore the 3% ceiling).<sup>3</sup> These results can be visualized in Figure 2.

Bad legislation	
Legislated ceiling	Range of prevailing ceilings
3%	25-250%
3000%	25-250%
Better legislation	
Legislated ceiling	Range of prevailing ceilings
15%	15-250%
300%	25-300%

Figure 2: Legislation and legal uncertainty

Generalizing, when legislation is completely within the zone of acceptance, no judge discards it so the variance of court decisions is “small”. When the legislation is completely outside the zone of acceptance, every judge discards it and the variance is “large”. And when the legislation is considered acceptable by few judges only, the variance is even greater, “very large”. Hence one message of the paper is that institutional mechanisms (such as *stare decisis*) that moderate dispersion and reduce legal uncertainty become more important as courts become more active in their task of double-checking misguided legislation.

The remainder of this introduction discusses the related literature. Section 2 provides examples of the interplay between credit market legislation and court decisions that confirm our main assumption. Section 3 describes our model of adjudication and demonstrates its implication for the enforcement of legislated prohibitions. Section 4 applies this result to a simple economy with usury laws. Section 5 discusses other examples and applications. Section 6 discusses the problem of legal uncertainty. Section 7 concludes.

## 1.1 Related Literature

The fact that courts exercise judgment and some level of discretion in interpreting legislation has been known for a long time. Landes and Posner (1975) argued that courts tend to interpret statutes in much the same way that they interpret contracts. In contract law, the basic canon for interpretation is the intention of the parties; similarly, courts interpret legislation in accordance with the original legislative understanding. Landes and Posner’s reasoning infers court motives from results, and goes like this: if courts habitually placed

<sup>3</sup>Similarly, the courts that uphold the 300% legislated interest rate ceiling are those that would otherwise choose a ceiling close to 250%, as those who would choose a lower ceiling would reject the null hypothesis that the 300% cap is appropriate. As a result, compared to a situation with a 3000% interest rate ceiling, the 300% legislated cap raises legal uncertainty because a credit contract with a 280% interest rate is subject to legal uncertainty in the latter case (some courts uphold the 300% ceiling) but not in the former case (all courts ignore the 3000% ceiling).

their will above that of legislators, legislative bargains would be worth very little, so courts would effectively reduce the rents available to the legislators that profit from brokering the sale of legislation to interest groups. Such an arrangement would be of no interest to legislators and politicians in general, so the latter structure the judicial system in a way that insulates judges from the results of the cases they decide. Judges generally have tenure, fixed remuneration and few prospects of promotion. Having nothing to gain from being creative, courts presumably go along with legislators and enforce the political deals incorporated in legislation.

The Landes and Posner's argument was framed as a positive account – a description of, but not a prescription to, courts. Indeed, theirs is a testable hypothesis, but the supporting evidence is weak (Macey, 1986). Nevertheless, the enduring force of the Landes and Posner's proposition rests on its implied normative message, namely that in interpreting statutes courts should abide by the intention of the legislators because otherwise they will not only thwart the political system, but also increase legal uncertainty. This idea is developed in Easterbrook (1984). Alternative economic conceptions over the normatively desirable interpretative court strategy were formulated over time. Noticeably, Macey (1986) argued that courts should interpret statutes not as contracts but in a manner consistent with the stated public-regarding purpose of each statute, the objective being not to completely prevent interest groups from influencing lawmaking, but to raise the cost for doing so. Other influential normative conceptions in this debate include those of Eskridge (1987) and Farber and Frickey (1991).

The difficulties in coming up with a definitive economic benchmark for statutory interpretation helps explain why more recent work accepts (often implicitly) that some legal issues are amenable to a range of reasonable views that do not necessarily represent errors. Their approach can be framed more as exercises in social choice theory rather than in law and economics, because the focus is less on proposing efficient solutions to legal dilemmas and more on aggregating the different views of judges into a controlling conception.

Finding this controlling conception, however, is not easy, because the question of “what judges maximize?” has proven to be quite problematic (Cooter, 1983; Posner, 1993, 2005). Limited evidence exists that in adjudicating cases judges maximize expected monetary (Anderson, Shughart II and Tollison, 1989; Toma, 1991) or political gains (Cohen, 1991; Morriss et al., 2005; Choi and Gulati, 2004), so judicial motivation remains a conundrum for theories that regard judges as strictly self-seeking actors (Epstein, 1990; Kornhauser, 1992a). To deal with this problem, even authors identified with the tradition of law and economics had to embrace richer versions of judicial utility. Richard Posner, for example, later

analogized judges to nonprofit enterprises, voters and spectators at theatrical performances to construct judicial utility as a function of leisure, prestige, reputation, self-respect, the intrinsic pleasure of the work, and even “the other satisfactions that people seek in a job” (2008, p. 36; Epstein et al., 2013).

Some authors refine these ideas by distinguishing judicial utility that is derived from case dispositions (Badawi and Baker 2015; Cameron et al, 2000; Cameron and Kornhauser, 2006; Carrubba and Clark, 2012; Fischman, 2011; Cameron and Kornhauser 2015; Lax, 2003; Callander and Clark, 2013; Beim et al, 2014) and policies (Kornhauser 1992a, 1992b, 1995), or by empirically testing or factoring into the model institutional details of courts such as collegial and group decision-making (Kornhauser and Sager, 1986, 1993; Stearns, 2000) and panel composition effects (Revesz, 1997; Cross and Tiller, 1998; Sunstein et al. 2004). Recently, some studies documented the effects of other factors such as the presence of salient facts (Bordalo et al., 2015) and opinion authorship (Farhang et al., 2015).

Alternatively, authors drawing on the tradition of positive political theory focused on the role of the judiciary in shaping policy rather than on judicial utility (e.g. Miller and Moe, 1983; McCubbins et al., 1987, 1989). While most studies focused on the effects of substantive policy preferences that are based on the judge’s ideology (e.g., Segal, 1989; Martin and Quinn, 2002) and prejudices (Kastellec, 2013; Martin and Pyle, 2000; Sen, 2015), others focused on the interactions between the judiciary and other branches of government (Ferejohn and Shipan, 1990; Gely and Spiler, 1990, 1992; Eskridge and Ferejohn, 1992). In a seminal article focusing specifically on statutory interpretation, Ferejohn and Weingast (1992) proposed that judicial interpretations reflect the strategic setting in which they are announced. In passing legislation, legislatures calculate the risk of court invalidation; similarly, courts decisions reflect the external political reality, for failing to take it into account can always trigger the enactment of new legislation that rebuffs the courts’ position.<sup>4</sup>

Our approach is more closely related to Baker and Kornhauser (2015), who also build a model of judicial deference. However, they study whether an appellate court wants to impose its judgment over a possibly biased trial court that has more factual information, while here, facts are known and the question is whether the legislation is appropriate. The model structure and applications are also very different.

The model developed herein crucially also advances a proposition about the dispersion

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<sup>4</sup>In the spirit of rational choice theory, ours is a positive model of adjudication, especially in the sense that we advance no claims as to when courts should reject or enforce a legislated prohibition. But we do not see ourselves as writing the tradition of political positive theory because we are not concerned with the broader workings of the political system but rather with drawing economic implications from the adjudication model. The parallels with positive political theory are anecdotal at best: Ferejohn and Weingast (1992) posited the existence of a set of politically viable court interpretations, which are those that are stable because they do not provoke a legislative response. Similarly, our model shows that once a judicial prohibition has been established, the permitted zone can be enlarged with legislation that creates not too large of a disagreement by the courts.

of court decisions. This resonates with a discussion of legal uncertainty, which has been regarded as an economic problem for a long time. Famously, Max Weber (1922) went as far as to attribute the very emergence of capitalism in part to the ability of continental European legal systems to foster “calculability” through the rational codification of law.<sup>5</sup> More recently, this view has been questioned, but just in part. The law and finance literature promoted the hypothesis that judge-made Common Law systems are better for financial development and economic growth than the Civil Law tradition that so captivated Weber (LaPorta et al., 1997, 1998; Botero et al., 2004; Johnson et al., 2000).

Yet, even in the United States, statutes enacted by legislatures have now become the primary source of law (Calabresi, 1982). Moreover, the notion that predictable courts are important for economic rationality and market coordination continues to loom large in economic thinking. It finds particular resonance in transactions costs economics (Coase, 1991; Williamson, 1999) and in some strands of the literature on law and development (Dam, 2006; Cooter and Schaefer, 2012).

In the modern law and economics literature, however, legal uncertainty has only been a derivative topic. The tradition in the field is to subsume legal uncertainty into the more normative-oriented category of “legal error”. Indeed, the typical exercise in economic analysis of law is normative in character: an efficient benchmark is proposed and the non-conforming court decisions are treated as errors (Schwartz and Beckner III, 1998). With few exceptions (e.g. Rhee, 2012; Rasmusen and Ramseyer, 2010; Salama, 2012), legal uncertainty is then framed as a byproduct of error, and the prospects of more errors in adjudication entail the prospects of greater legal uncertainty.<sup>6</sup> Our contribution in this paper is different, as we are concerned with the interplay between legislation and legal uncertainty.

To sum up, economic research on judicial decisions has largely focused on understanding judicial preferences. The focal question is whether courts are motivated by strictly legal reasons or by non-legal concerns such as ideology or self-interest. In this paper, we take a different route. We want to understand how the information conveyed by a piece of legislation about its own appropriateness affects court decisions.

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<sup>5</sup>For Weber, the other major contribution of the legal systems to the emergence of capitalism was the development substantive legal provisions amenable to a market economy, especially those establishing freedom of contract. See Trubek (1972). See also Kaelber (2004) for discussion of Weber’s views on usury laws.

<sup>6</sup>The merger between legal uncertainty and legal error can be visualized, for example, in the discussion of accuracy in adjudication (Kaplow and Shavell, 1994, 1996). Take accident law for example, where the literature posits that courts are increasingly inaccurate as they depart from incentivizing optimal care. If increasing accuracy in adjudication were costless, courts would always decide cases correctly. But courts can only pursue accuracy up to a point, because more accuracy requires more information, which comes at a cost. Thus, courts make mistakes (that is, decide cases inaccurately). Legal uncertainty arises because in light of the prospects of court mistakes, individuals vary in their perception about how much they must invest in compliance in order to avoid liability. As a result, they may be over-deterred in beneficial activities or under-deterred in harmful activities (Craswell and Calfee, 1986; Polinsky and Shavell, 1989; Schinkel and Tuinstra, 2006).



## 2 Judicial deference to usury laws

A discussion of statutory prohibitions based on usury laws may at first seem odd, not least because for centuries these laws have been denounced as counterproductive and wasteful (Turgot, 1770; Bentham, 1818; Mill, 1909).<sup>7</sup> Yet usury laws endure almost everywhere. Interest rate caps can still be found even in the books of developed countries such as Japan (Ramseyer, 2013), most countries in the European Union (Reifner and Schröder, 2012), and several states in the United States (Geisst, 2013). The topic of interest rate ceilings is still relevant for actual policy debates.

Moreover, in the backdrop of the apparent anti-usury laws consensus of the economics profession, there are theories proposing these laws have welfare enhancing properties. Stiglitz and Weiss (1981), Posner (1995) and Coco and De Meza (2009) portray usury laws as a remedy for borrowers' moral hazard. Bar-Gill (2004) argues that usury laws can be a means to neutralize certain consumers' behavioral biases. More imaginatively, Barzel (1997, p. 170) frames such laws as a mechanism to avoid overconsumption of public goods by saving on court costs. Besides that, studies focused on economic history portrayed usury laws as substitutes for incomplete insurance markets (Posner, 1980; Carr and Landa, 1983; and Glaeser and Scheinkman, 1998).<sup>8</sup>

Our model shows that in some cases the enactment of a usury law can serve the purpose of increasing the availability of credit and the interest cap effectively prevailing. Thus this model can also be conceived as a novel justification for the enactment of carefully drafted usury laws. But unlike previous attempts, our justification is procedural rather than substantive in nature. Here the occasional desirability of usury ceilings does not rest on the properties of the ceilings themselves (in reducing moral hazard, biases, exploitation or whatever). Rather, usury laws may be desirable because of the interplay between legislators and courts in the specific situations where the former enact usury ceilings that paradoxically increase (rather than decrease) the interest rates that are tolerated by the latter and effectively prevails.<sup>9</sup>

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<sup>7</sup>Earlier works helped to break the ancient prejudice against interest rates. See Hugo Grotius, *The Rights of War and Peace* (1625, 1901, p. 155-6), linking interest rates with credit risk and opportunity cost, and delinking it from natural law ("The five shillings commission which a banker, for instance, charges upon every hundred pounds, is not so much an interest in addition to five per cent, as a compensation for his trouble, and for the risk and inconvenience he incurs, by the loan of his money, which he might have employed in some other lucrative way" [ . . . ] "Those human laws, which allow a compensation to be made for the use of money or any other thing, are neither repugnant to natural nor revealed law"). See also Claudius Salmasius, *De usuris liber*, Lugd. Batavor.: Ex officina Elseviriorum, 1638 (treating money-lending as a business similar to any other).

<sup>8</sup>Economists have also offered explanations for usury laws based on their political economy and distributive effects (Ekelund et al., 1989; Benmelech and Moskowitz, 2010). Others have looked at the impacts of usury laws on credit markets (Eichengreen, 1984; Bodenhorn, 2007; Temin and Voth, 2008). Still other works have discussed the theoretical conditions under which legal restrictions to private contracts can enhance efficiency (Aghion & Hermalin, 1990; Bar -Gill, 2015; Schwartz, 1995).

<sup>9</sup>Usury laws (or any other prohibition) might be enacted as a response to some form of market failure or bounded rationality, but our goal is to discuss the possibility of usury laws serving as "permitting prohibitions" (or as "prohibiting permissions"), and the inclusion of market failures or limited rationality in the model would not change its positive implications.

The most fundamental premise of the model is that legislated policies that seem reasonable to courts are more likely to be followed. Thus, the odds of judicial deference go down as the courts increase their level of disagreement with legislation. This proposition is intuitive and much could be offered to empirically support it. A discussion of litigation within Brazilian credit markets offers two examples that empirically ground this proposition specifically in the context of the validity of contractual interest rates.

The first example arose in a situation where courts rejected Brazil’s current legislated policy of exempting financial institutions from interest rate caps.<sup>10</sup> Salama (2017) used a text-mining algorithm to look at 888 court cases where debtors questioned the validity of interest rate charges in auto loans. He found that courts were increasingly prone to favor debtors as the contracts’ interest rates rose, despite the legislated policy of no interest rate ceilings. The results suggested that judges sometimes find contractual interest rates “too high”. Since it is not written anywhere what “too high” means, that depends on judgment calls by the judges.

The other example has to do with the opposite situation, where rather than rejecting a legislated policy deemed “too lenient” courts reject a legislated policy deemed “too strict”. The Brazilian constitution of 1988 originally established that “real interest rates [...] shall not exceed 12% per year”. In a country with a history of chronic inflation (and with hyperinflation when the constitution was enacted) an interest rate ceiling of 12% per year would not only have been ineffectual, but could also have been fatal to the solvency of the whole financial system. The constitutional provision was sure to be inappropriate. Wisely, the Brazilian Supreme Court held that the legislated ceiling was merely a constitutional ambition; not an actionable rule. In so doing, it effectively failed to defer to the legislator.<sup>11</sup>

Noticeably, the notion that courts may play an important role in defining maximum acceptable interest rates is not a typically Brazilian phenomenon. For one, even where the legislation contains no express interest rate ceiling courts in different jurisdictions routinely resort to doctrines such as “anatocism”, “extortionate credit bargain” and “unconscionability”<sup>12</sup> to invalidate contracts with interest rates deemed as excessive. Sometimes, courts will go as far as to establish detailed tests, as in the case of Germany where the Supreme Court upholds a presumption that interest rates are contrary to good morals when they exceed double the relevant market rate (Reifner and Schröder, 2012).

Court rejection of usury ceilings deemed inappropriately low is also not specific to Brazil.

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<sup>10</sup>To be precise, in Brazil both financial and non-financial institutions are subject to caps on default interest rates. However, financial institutions are not subject to legislated caps on interest rates before default.

<sup>11</sup>It took another fifteen years for the usury ceiling to be scrapped from the constitutional text.

<sup>12</sup>Unconscionability is the doctrine prevailing in the United States. See Allan Farnsworth, *Contracts*, § 4.28, at 314 (3d ed. 1999) (analyzing the doctrine of unconscionability as invoked by consumers). The unconscionability doctrine has been legislated and appears in U.C.C. § 2-302 and Restatement (Second) of Contracts § 208.

Consider for instance the fate of several state interest rate ceilings in the United States. During the 20th century the scope of these ceilings was continually reduced through court interpretation, often on the legal grounds that interest statutes were in derogation of the common law and should be strictly construed (Shanks, 1930).<sup>13</sup> Later, in 1978 the United States Supreme Court<sup>14</sup> held that these state interest caps (which became very problematic when inflation rose) could not be enforced on national banks that were based in other states.<sup>15</sup> National banks could then circumvent state ceilings by basing themselves in a no-ceiling or high-ceiling state, as is now common (Saunders and Cohen, 2004). Other examples include the case of Canada, where it is a crime to charge yearly interest rates above 60% but the legislation is rarely applied to payday lenders where charges are much higher (Howell, 2005).

This is not to say that legislated usury ceiling are simply toothless – for example, the French criminal usury statute is said to have substantially curtailed the development of the high-yield bond market in France (Cafritz and Tene, 2013). But court deliberation about usury legislation seems to be an ever-present phenomenon. In Ancient Rome, for instance, the existence of legislation on usury did not prevent judges from frequently adjusting interest rate ceilings to what was customary in the community (Mackeldey, 1883, p. 306). Courts continued to play a role in shaping interest rate ceilings well into modernity. For instance, a study about the American experience in the 19th century concluded that courts tended to maintain usury laws for handshake agreements while allowing more latitude to parties writing contracts (Geisst, 2013, p. 149). All of the above justifies the premise that courts may disagree with interest rate legislation in finding it too lenient (so contracts that are in the permitted zone are invalidated) or too strict (so contracts that are in the prohibited zone are validated).

### 3 The model of contingent judicial deference

A case, characterized by a variable  $x$ , is contested in court. The variable  $x$  may be the interest rate in a credit contract, the number of trials before a new drug was sold over the counter, how much capital a business held before it went bust, the years of experience of the captain of the sinking boat, the time between conception and termination of pregnancy,

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<sup>13</sup>Straus v. Elless Co., 222 N. W. 752 (Mich. 1929); Alston v. American Mortgage Co., 116 Ohio St. 643, 157 N. E. 374 (1927); Byrd v. Link-Newcomb Mill and Lumber Co., 118 Miss. 179, 79 So. 100 (1918).

<sup>14</sup>See Marquette Nat'l Bank of Minneapolis v. First of Omaha Service Corp., 439 U.S. 299, 318 (1978).

<sup>15</sup>In the United States, the term “national bank” designates a bank that is chartered and supervised by the Office of the Comptroller of the Currency (OCC). State banks, in contrast, are chartered and supervised by state government. Case law has extended the privilege of “exporting” interest rates from more to less favorable states to federally-related lenders that are state-chartered and to federal savings and loans institutions.

etc.

There exists a maximum admissible value of  $x$ , denoted by  $\bar{x}$ , but adjudicators are imperfectly informed and don't know what the ceiling should be – they do not know the exact value of  $\bar{x}$ . In the above examples,  $\bar{x}$  may be an interest rate ceiling (to detect unconscionability), the minimum number of trials for a drug (to detect fulfillment of the manufacturer's duty of care), capital requirements for firms (to detect undercapitalization), and so on.

Adjudicators have information from: (i) the specific legislation on the topic; and (ii) their own priors, which comprise every relevant aspect of the law but the specific legislation. The prior varies across adjudicators, since the interpretation of how general principles of law apply to a specific case should be subject to significant idiosyncratic differences.

Adjudicator  $i$  is characterized by her prior beliefs about  $\bar{x}$ , represented by a continuous density function  $f_i$ . For simplicity, we assume that  $\bar{x}$  is distributed between  $\bar{x}_L$  and  $\bar{x}_H$ , with  $0 \leq \bar{x}_L < \bar{x}_H < \infty$ . In Appendix A we show a simple generalization of the model that allows for an unbounded support and a positive mass at  $\bar{x} = \infty$ .

We make two technical assumptions on this density function:  $f_i$  is strictly quasi-concave, which means that if  $\bar{x} = 30\%$  is more likely to be the ideal ceiling than  $\bar{x} = 20\%$ , then  $\bar{x} = 15\%$  has to be even less likely; and the density of the median  $f_i(\bar{x}_i^{med})$  is larger than  $1/(\bar{x}_H - \bar{x}_L)$  (which would be the density in case of a uniform distribution), which means that the median is not an unlikely draw. These assumptions are satisfied by single-peaked distributions with sufficient mass around the peak. Figure 3 shows an example of a function  $f_i$ .

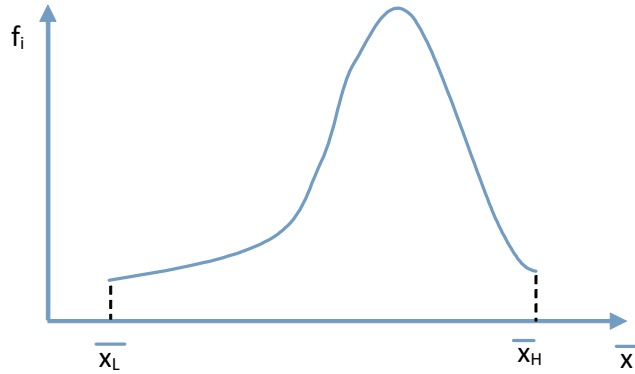


Figure 3: Beliefs of adjudicator  $i$  about  $\bar{x}$

To help fix ideas, in the example of interest rate ceilings, a ‘pro-market’ adjudicator who believes that the ideal ceiling  $\bar{x}$  would probably be high is characterized by a distribution

$f_i$  that assumes low values for low  $\bar{x}$  and high values for large  $\bar{x}$ . In contrast, a ‘skeptical-about-markets’ adjudicator is characterized by a distribution  $f_i$  that assumes high values for small ceilings  $\bar{x}$ . A distribution  $f_i$  with a high variance (and hence a low peak) characterizes an adjudicator that feels poorly informed about the issue.

There is also legislation establishing a ceiling  $\bar{x}$ , which we denote by  $\bar{X}$  (it can be any number between  $\bar{x}_L$  and  $\bar{x}_H$ ). An adjudicator asks herself: was the legislation guided by good and accurate information? Was it enacted by well-intentioned legislators? Have circumstances changed enough to make that piece of information irrelevant?

In order to capture this idea in the simplest possible way, we assume there are two types of legislators: the ‘good’ legislator knows what  $\bar{x}$  should be and chooses  $\bar{X} = \bar{x}$ ; the ‘bad’ legislator is a clueless agent that chooses  $\bar{X} = \tilde{x}$ , where  $\tilde{x}$  is a random draw from a uniform distribution between  $\bar{x}_L$  and  $\bar{x}_H$ .<sup>16</sup> The prior probability that the legislator is ‘good’ is  $\pi$ . Using her prior and Bayes rule, adjudicator  $i$  calculates the probability that the legislator is good given  $\bar{X}$ .

In what follows, we assume that the adjudicator either follows the legislation or ignores it, in which case she decides based on her prior only. The underlying idea is that adjudicators are effectively constrained by legislation: either they apply the legislation or they justify why it should not be applied and base their decision on something else, which in the model is represented by their prior beliefs. The decision thus depends on preferences about following and ignoring a good and a bad piece of legislation. We can thus assume that adjudicator  $i$  applies the legislation if her posterior probability that the legislator is good is at least as large as  $\alpha$ , where  $\alpha \in (0, \pi)$ , and ignores the legislation otherwise. If the legislation is ignored, the adjudicator chooses what is more likely to be the correct decision according to her prior  $f_i$  only.<sup>17</sup>

An adjudicator facing no institutional constraints would not restrict herself to a choice between applying or ignoring the legislation. She would calculate the probability that each decision is optimal and act accordingly. The underlying idea is that an adjudicator can always find a way to justify her decision. We present a model along these lines in Appendix B. Our main conclusions also hold in that setting.

<sup>16</sup>The random draw from a uniform distribution is a modeling simplification that allows us to capture the key idea that ceilings in a certain range are more likely to reflect a sensible view of the world, while ceilings outside this range are less likely to be based on accurate knowledge about the issue. In the model in Appendix A, the implied distribution of  $\bar{x}$  from the ‘bad legislator’ is not uniform, which seems more realistic.

<sup>17</sup>The evaluation of the legislation thus resembles a hypothesis test: just like a person being trialed is presumed sane (but can later be proved insane), the legislation is presumed ‘good’ (but can be circumvented if unacceptable to courts). In practice, courts pursue a number of strategies to circumvent the command enshrined in legislation. For example, in rejecting statutory caps to punitive damages that are deemed too low, US state courts can level a constitutional challenge against the cap (as modeled in Avraham and Bustos, 2010). Alternatively, the passing of a cap on punitive damages can prompt juries to grant larger compensatory damage awards that disguise the embedded punitive element, as suggested in Robbennolt and Studebaker (1999) and Sharkey (2008).

### 3.1 The adjudicator's decision

The legislation reveals information about the type of the legislator. A simple application of the Bayes rule yields the posterior probability that the legislator is ‘good’ conditional on the observed ceiling, denoted by  $\Pr(\text{good}|\bar{X})$ :

$$\Pr(\text{good}|\bar{X}) = \frac{(\bar{x}_H - \bar{x}_L) \pi f_i(\bar{X})}{(\bar{x}_H - \bar{x}_L) \pi f_i(\bar{X}) + 1 - \pi} \quad (1)$$

Owing to the quasi-concavity of  $f_i$ ,  $\Pr(\text{good}|\bar{X})$  is also quasi-concave in  $[\bar{x}_L, \bar{x}_H]$ . The posterior probability  $\Pr(\text{good}|\bar{X})$  is depicted in Figure 4.

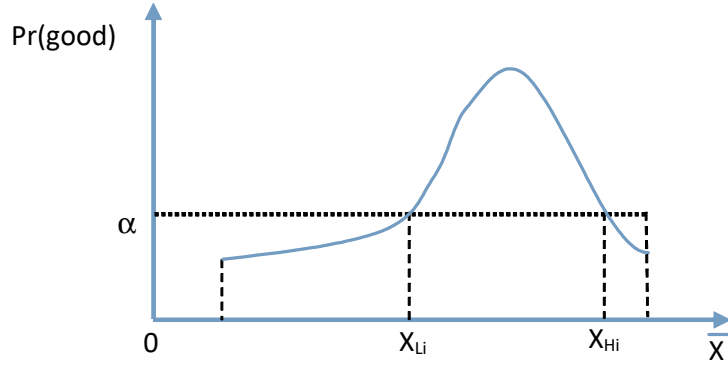


Figure 4: Posterior probability that the legislator is ‘good’

Intuitively, when  $f_i(\bar{X})$  is small, adjudicator  $i$  has reasons to believe that the legislation came from a ‘bad’ legislator – because a good legislator is unlikely to choose such  $\bar{X}$  and a bad legislator chooses randomly. Since  $\Pr(\text{good}|\bar{X})$  is quasi-concave, the likelihood of a good legislator will be sufficiently small if  $\bar{X}$  is below some critical point  $X_{Li}$  or if  $\bar{X}$  is larger than some critical point  $X_{Hi}$ . Define  $X_{Li}$  as

$$X_{Li} = \sup \{x | \Pr(\text{good}|\bar{X}) \leq \alpha \text{ for all } \bar{X} < x\}$$

and  $X_{Hi}$  as

$$X_{Hi} = \inf \{x | \Pr(\text{good}|\bar{X}) \leq \alpha \text{ for all } \bar{X} > x\}$$

as depicted in Figure 4. Last, define  $X_{0i}$  as

$$X_{0i} = \bar{x}_i^{med}$$

Note that since  $f_i(\bar{x}_i^{med}) > 1$ ,  $\Pr(\text{good}|\bar{x}_i^{med}) > 1$ . Hence,  $X_{Li} < X_{0i} < X_{Hi}$ .

The following proposition summarizes the adjudicator's decision.

**Proposition 1** Consider a maximum legislated  $x$  given by  $\bar{X} \in [\bar{x}_L, \bar{x}_H]$ .

1. There is deference to legislation as long as  $\bar{X} \in [X_{Li}, X_{Hi}]$ , with  $\bar{x}_L \leq X_{Li} < X_{Hi} \leq \bar{x}_H$ .
2. Whenever  $\bar{X} \notin [X_{Li}, X_{Hi}]$ , the adjudicator ignores the legislation follows a ceiling  $\bar{X}_i^* = X_{0i}$ .

**Proof.** See the appendix. ■

The key implication of the model is that  $\bar{X}_i^*$ , the threshold that effectively determines the court decision, is non-monotonic in  $\bar{X}$ . Figure 5 illustrates this point.

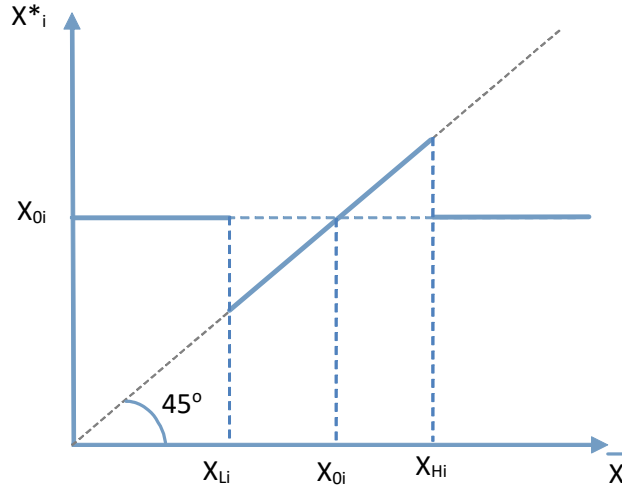


Figure 5: Adjudicator  $i$ 's effective ceiling

As long as  $\bar{X} \in [X_{Li}, X_{Hi}]$ ,  $\bar{X}_i^* = \bar{X}$ , so there is judicial deference. However, when  $\bar{X} < X_{Li}$ , the likelihood of a ‘good’ legislator is sufficiently small, hence the statute is ignored and the adjudicator’s effective ceiling becomes  $X_{0i}$ , which is larger than  $X_{Li}$ . Likewise, when  $\bar{X} > X_{Hi}$ , the rule is discarded and the adjudicator’s effective ceiling becomes  $X_{0i} < X_{Hi}$ .

As mentioned before, a Bayesian adjudicator facing no institutional constraints would calculate the probability that each decision is optimal and act accordingly. The model in Appendix B considers this case and shows that an adjudicator’s effective ceiling  $\bar{X}_i^*$  would also be non-monotonic in the legal cap  $\bar{X}$ . The relationship between  $\bar{X}_i^*$  and  $\bar{X}$  would be given by Figure 14 instead of Figure 5, but the qualitative implications in both cases are basically the same.

### 3.2 The odds a transaction is invalidated

We now consider a world with several adjudicators, and an agent does not know the adjudicator's type when suing. A lawsuit against a transaction characterized by  $x$  (say, the interest rate in a credit contract) is brought to court. We now compare the odds the lawsuit will be successful under two different legislated caps,  $\bar{X}_1$  and  $\bar{X}_2$ , with  $\bar{X}_1 < \bar{X}_2$ .

For  $x \in (\bar{X}_1, \bar{X}_2)$ , the two legislated caps yield different prescriptions and that has a direct effect on adjudicators' decisions. Those who choose to follow the rules will allow the transaction when the legislated cap is  $\bar{X}_2 > x$  but not when the cap is  $\bar{X}_1 < x$ . However, when  $x \notin (\bar{X}_1, \bar{X}_2)$ , a larger legislated cap has the opposite effect on adjudicators' decisions. Proposition 2 summarizes the result.

**Proposition 2** *Consider legislated caps  $\bar{X}_1$  and  $\bar{X}_2$ , with  $\bar{X}_1 < \bar{X}_2$ . Denote by  $p(x|\bar{X})$  the probability that a contract characterized by  $x$  will be judged illegal given an interest rate cap equal to  $\bar{X}$ .*

1. For  $x \notin (\bar{X}_1, \bar{X}_2)$ ,  $p(x|\bar{X}_2) \geq p(x|\bar{X}_1)$ .
2. For  $x < \bar{X}_1 < \bar{X}_2$ ,  $p(x|\bar{X}_2) > p(x|\bar{X}_1)$  whenever there is an adjudicator  $i$  such that  $X_{0i} < x$  and  $\bar{X}_1 \leq X_{Hi} < \bar{X}_2$ .
3. For  $\bar{X}_1 < \bar{X}_2 < x$ ,  $p(x|\bar{X}_2) > p(x|\bar{X}_1)$  whenever there is an adjudicator  $i$  such that  $X_{0i} \geq x$  and  $\bar{X}_1 \leq X_{Li} < \bar{X}_2$ .

**Proof.** See the appendix. ■

Figure 6 shows an example of the probability that a contract characterized by  $x$  will be judged illegal in case of a legislated cap equal to  $\bar{X}_1$  (solid line), and in case of a more lenient cap, equal to  $\bar{X}_2$  (dashed line). For  $x \notin (\bar{X}_1, \bar{X}_2)$ , the prescription from both caps is the same. However, the likelihood that each rule be followed is (potentially) different. The first statement of Proposition 2 shows that as long as the transaction is not directly affected by the change in the legislation – i.e., for contracts with  $x \notin (\bar{X}_1, \bar{X}_2)$  – the probability that the contract will be invalidated is at least as *large* for more lenient laws. The second and third statement of the proposition show what is needed for the probability  $p(x|\bar{X})$  to (strictly) increase in  $\bar{X}$ .

The intuition for the second statement of Proposition 2 is as follows: without any rule, adjudicator  $i$  would deem excessive any contract with  $x > X_{0i}$ , which is smaller than both legislated caps. A (relatively) strict law setting a cap equal to  $\bar{X}_1$  is in the realm of reasonable rules for adjudicator  $i$ , since  $\bar{X}_1 < X_{Hi}$ . Hence, adjudicator  $i$  would follow



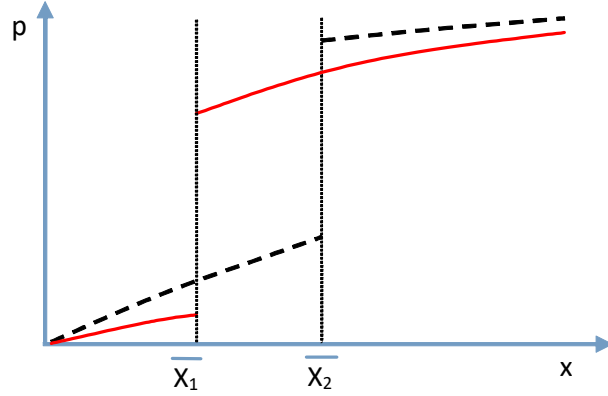


Figure 6: Probability the contract is invalidated under the more lenient rule (dashed line) and under the stricter rule (solid line)

this rule and allow transactions as long as  $x < \bar{X}_1$ . In contrast, a legislated cap equal to  $\bar{X}_2$  is deemed excessively lenient by adjudicator  $i$ , since  $\bar{X}_2 > X_{Hi}$ . This rule is thus rejected, so adjudicator  $i$  follows her own judgment and deem illegal contracts with  $x > X_{0i}$ . Although the legislated ceiling prescribed by the more lenient rule,  $\bar{X}_2$ , is larger than  $\bar{X}_1$ , the adjudicator effectively considers an interest rate ceiling that is smaller than  $\bar{X}_1$  (since  $X_{0i} < \bar{X}_1$ ).

The intuition for the third statement of Proposition 2 is basically the same. A (relatively) lenient law setting a ceiling equal to  $\bar{X}_2$  is in the realm of reasonable rules for adjudicator  $i$ , since  $\bar{X}_2 > X_{Li}$ . Hence, adjudicator  $i$  would follow this rule and disallow contracts with  $x > \bar{X}_2$ . In contrast, a legislated cap equal to  $\bar{X}_1$  is deemed excessively strict by adjudicator  $i$ , since  $\bar{X}_1 < X_{Li}$ . This rule is thus rejected, so adjudicator  $i$  follows her own judgment and decides according to a ceiling  $\bar{X}_i^* = X_{0i}$ . Although the cap prescribed by the stricter rule is smaller than  $\bar{X}_2$ , the adjudicator effectively considers a ceiling that is larger than  $\bar{X}_2$  (since  $X_{0i} > \bar{X}_2$ ).<sup>18</sup>

## 4 Application: usury laws

We now apply our model of contingent judicial deference to an economy with a simple credit market. We assume there are no market failures and no reason for interest rate caps. We choose this modeling strategy for simplicity and to ensure that all effects of usury laws on

<sup>18</sup>Note that this model generates the empirical pattern described in Salama (2017) as mentioned in Section 2. Adjudicator  $i$  will declare a credit contract is not valid if the likelihood of a good legislator is sufficiently small and the contracted interest rate  $x$  is larger than  $X_{0i}$ . As long as the first condition holds for some adjudicators, the odds a contract will be deemed invalid owing to excessively high interest rates will be increasing in  $x$ , since the mass of adjudicators with  $X_{0i} < x$  is increasing in  $x$ .

this economy are on the maximum allowed interest rate and on the probability a lawsuit against high interest rates are accepted. The set of possible economic reasons for capping interest rates includes: some form of irrationality or time inconsistency in preferences that leads agents to borrow at excessively high interest rates; some negative externality from risky loans; banks' market power; among others. A model with some of these (or other) reasons for capping interest rates with the same demand and supply curves for loans would yield the same positive implications as this model. The normative implications could be different, but these are not the focus of this paper.

There is a measure-one continuum of agents, indexed by  $j$ , each one with an investment project. In order to invest, an agent needs to borrow 1 unit of resources, the cost of a project. The probability that project  $j$  will succeed is  $\rho_j$ , which is specific to the agent and lies in the interval  $(0, 1)$ . A successful project yields  $B$  (a constant larger than 1) with probability  $\rho_j$  and 0 otherwise. There is limited liability, so the debt is wiped away when the project yields 0 and  $B$  is the maximum amount a bank can collect.

There is a competitive banking sector. Banks lend to agent  $j$  at rate  $R_j = 1 + r_j$ , which is endogenous (and they may decide not to lend). All information is common knowledge ( $\rho_j$  is known to everyone). The opportunity cost of resources is normalized to 0. Banks and agents are risk neutral.

#### 4.1 Benchmark case: no litigation

Suppose there are no court cases. The only risk faced by the bank is that agents might go bankrupt.

Let  $R_j$  be the interest rate in a loan to agent  $j$ . The zero profit condition for a bank implies:

$$\rho_j R_j = 1 \implies R_j = \frac{1}{\rho_j} \quad (2)$$

Loans occur in this model as long as

$$\rho_j B \geq 1 \quad (3)$$

Figure 7 shows interest rates in this economy as a function of the probability of success  $\rho_j$ , for a given  $B$ .

A binding cap on interest rates would reduce the amount of loans in this economy. Disallowing interest rates larger than  $\bar{R} < B$  would imply that projects with  $\rho_j \in [1/B, 1/\bar{R})$  would not be financed.

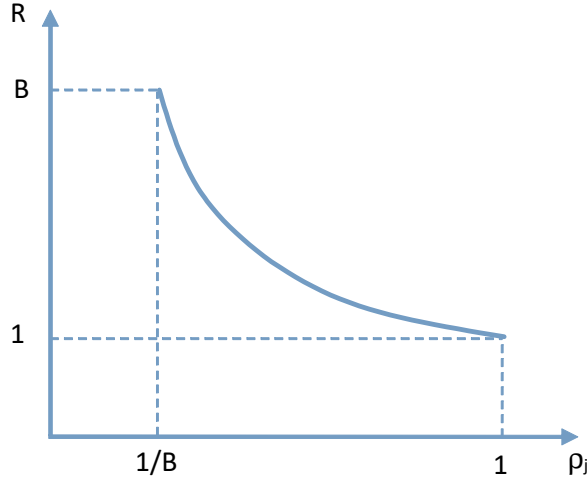


Figure 7: Interest rates as function of  $\rho$  (no court cases)

## 4.2 The law and the economy

We now include the possibility of lawsuits in the model. If her project succeeds, the borrower can go to court and try to avoid paying interest on her debt, which entails a cost  $c$  (we will think of it as an effort cost). When this happens, an adjudicator is randomly assigned to the case and the probability the agent does not need to pay interest on her loan is given as in Section 3.2. The model implies that the probability interest rates will be declared illegal is weakly increasing and possibly discontinuous in  $R$ .

For an agent that did not go bankrupt, it is worth going to court if the expected gain (interest not paid  $R_j - 1$  times probability  $p(R_j)$ ) is larger than  $c$ :

$$p(R_j) [R_j - 1] > c \implies R_j > \frac{c}{p(R_j)} + 1$$

Agents choose to sue if  $R_j > \hat{R}$  where:

$$\hat{R} = \inf_{R_j} \left\{ R_j - 1 - \frac{c}{p(R_j)} \geq 0 \right\} \quad (4)$$

In case  $R_j \leq \hat{R}$ , agent  $j$  will never choose to go to court. Hence a deal will occur whenever  $B$  is larger than  $1/\rho_j$  as in the benchmark case.

In case  $R_j > \hat{R}$ , agent  $j$  will sue if she does not go bankrupt. Hence, the expected payoff for the bank is

$$\rho_j ([1 - p(R_j)] R_j + p(R_j)) - 1$$

and the zero profit condition for banks implies

$$R_j = \frac{\frac{1}{\rho_j} - p(R_j)}{1 - p(R_j)} \quad (5)$$

hence  $R_j$  is increasing in  $p(R_j)$  as long as  $\rho_j \in (0, 1)$ . In words, the bank charges higher interest rates if the borrower has higher chances of prevailing in court (but the amount the bank can collect is limited to  $B$ ).

If the agent goes bankrupt, her payoff is 0. If her project is successful, she is expected to repay  $p(R_j) + (1 - p(R_j))R_j$  (with probability  $p$ , no interest is paid; with probability  $1 - p$ ,  $R_j$  is repaid) and the cost  $c$ . The agent is willing to borrow if her expected payoff, conditional on the success of the project, is positive. Hence, a deal occurs if:<sup>19</sup>

$$B - p(R_j) - (1 - p(R_j))R_j - c \geq 0$$

Plugging in the interest rate from (5), we get that a loan takes place as long as

$$\rho_j (B - c) \geq 1$$

which is a more stringent condition than the one in (3). Figure 8 illustrates the relationship between the probability of success  $\rho_j$  and the minimum interest rate charged by a bank.<sup>20</sup>

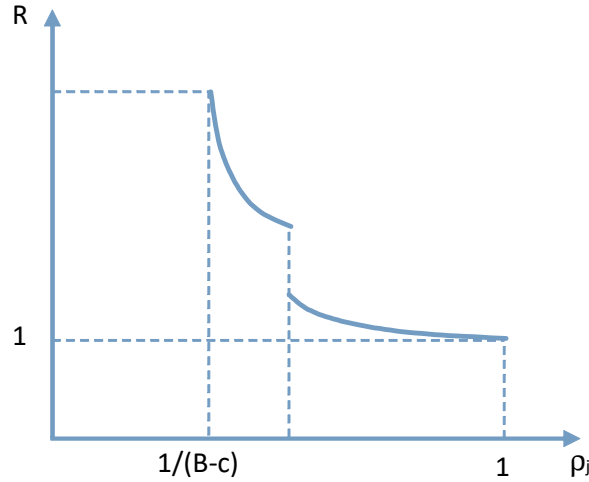


Figure 8: Interest rates as function of  $\rho$  (when lawsuits occur)

In the region where lawsuits occur, the minimum expected disbursement with interest rates is still  $1/\rho_j$ , as the probability that interest rates are deemed excessive by the adjudicator is priced in, but agents also pay the cost  $c$ . The largest interest rate in this economy

<sup>19</sup>Naturally, the probability interest rates are void is priced in loan contracts. Hence the legal risk considered ex ante by lenders will be consistent with the ex post probability that interest is not paid – whatever the legal risk is.

<sup>20</sup>Parameters in the figure are such that in equilibrium, some borrowers sue the bank.

is implicitly given by

$$R^{\max} = \frac{B - c - p(R^{\max})}{1 - p(R^{\max})} \quad (6)$$

but the marginal agent is effectively paying  $B - c$  in interest (in expected terms), in case her project succeeds. In the region where there is no litigation, filing a lawsuit does not pay off owing to the cost  $c$ . The discontinuity shows that banks lend at rates that are high enough to compensate for the losses in court, so in equilibrium some potential borrowers will be priced out of the market.

In comparison to the benchmark case in Section 4.1, the economy is affected in two ways: (i) there are less credit operations; and (ii) there are more costly lawsuits.

### 4.3 Usury laws

We now study the effects of a legislated interest rate cap  $\bar{R}$  in this credit market. First, consider an economy with no interest rate caps, i.e.,  $\bar{R} = \infty$ . Using (4) and (6), the condition for no lawsuits in equilibrium is that

$$p(B|\bar{R} = \infty) \leq \frac{c}{B - 1} \quad (7)$$

In words, if the probability that gross interest rate  $B$  will be deemed too high in an economy with no interest rate caps ( $\bar{R} = \infty$ ) times the gain from not paying interest ( $B - 1$ ) is not enough to cover the suing costs  $c$ , we are back to the case of Section 4.1. In case there are no lawsuits in equilibrium, usury laws can only reduce the amount of credit in the economy.

Now, assume there are lawsuits in equilibrium in this economy, so condition 7 does not hold. Proposition 3 shows conditions for the existence of interest rate caps that increase the amount of loans in the economy.

**Proposition 3** *Consider an economy with no interest rate caps where the condition in (7) does not hold, so there are lawsuits in equilibrium.*

1. *The maximum gross interest rate in this economy  $R^{\max}$  is larger than  $B$ .*
2. *There is an interest rate cap  $\bar{R} \in (B - c, B]$  that raises the amount of loans in this economy as long as*

$$p(B - c|\bar{R} = B - c) < \frac{c}{B - c - 1} \quad (8)$$

3. *An interest rate cap  $\bar{R} = B$  implements the equilibrium with loans to all projects that satisfy (3) and no lawsuits as long as*

$$p(B|\bar{R} = B) \leq \frac{c}{B - 1} \quad (9)$$

*Proof.* See the appendix. ■

The first statement of the proposition just shows that in the presence of lawsuits, although the marginal project financed in equilibrium is safer than the marginal project financed when no lawsuits occur, interest rates are larger. The high interest rates compensate the legal risk – interest rates might not be paid.

The second statement of the proposition shows that a properly chosen interest rate cap raises the amount of loans in this economy as long as the condition in (8) holds. There are two reasons for why the condition in (8) is milder than the condition in (7). The first is that (8) considers the probability an adjudicator will deem too lenient an interest rate cap of  $B - c$ , while (7) considers the probability a judge will deem too lenient a rule that imposes no restriction on interest rates. The latter probability might be substantially higher. The second reason is that (8) refers to the probability of a successful claim against interest rates  $B - c$ , while (7) refers to the probability of a successful claim against interest rates  $B$ . This reflects the idea that riskier projects can be financed at lower interest rates in the absence of legal risk (the risk that courts will declare interest rates are excessively high).

The third statement of Proposition 3 shows if (9) holds, a cap on interest rates at  $\bar{R} = B$  implements the equilibrium described in Section 4.1, where all projects with an expected positive return are financed. The condition in (9) is milder than that in (7) because an adjudicator might consider excessively lenient a rule that imposes no restriction on interest rates but might accept a rule that sets an interest rate cap of  $B$ .

In standard economic models, usury laws reduce the amount of loans in the economy, as agents that would only be able to get credit at very high interest rates cannot get loans. This effect is also present in this model. However, here, well chosen interest rate caps also affect adjudicators' decisions, reducing the probability of successful lawsuits. This leads to lower interest rates and might lead to more borrowing in equilibrium.

## 5 Examples

We used usury laws to demonstrate the proposition that legislation specifying that something cannot be done raises the probability that judges will allow related things not expressly forbidden.<sup>21</sup> We now wish to show that this proposition applies beyond credit transactions. We use life insurance as an example.<sup>22</sup> Older life insurance policies in the United States habitually contained a “suicide exclusion” whereby coverage would be denied to the benefi-

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<sup>21</sup>As well as on the analytically equivalent proposition that the enactment of legislation permitting something may raise the probability that judges will prohibit related things not expressly permitted.

<sup>22</sup>Most of the factual background on the history of life insurance discussed in this section can be found in Schuman (1993).

ciaries of a deceased person who voluntarily took her life.<sup>23</sup> The main concerns of insurance companies were, quite clearly, adverse selection and moral hazard. Yet judges and juries were often uncomfortable with upholding the suicide exclusion, normally for a concern with protecting an innocent beneficiary from ruin (a non-working wife with children, for example).<sup>24</sup>

To invalidate the suicide exclusion, courts basically employed the following reasoning: suicide is the intentional act of a person enjoying all her mental faculties, but those who commit suicide are in principle insane, so insurance companies can only deny recovery if they can prove that the persons who took out their lives were sane in doing so.<sup>25</sup> But fulfilling this burden of proof was evidently difficult, not least because the person whose sanity was in question was already dead, so courts could then recharacterize suicides as accidents and maintain the right to recovery under the insurance policy.<sup>26</sup> Insurance companies tried to deal with this problem by drafting the suicide exclusion so as to encompass “suicide, sane or insane”, but that broader wording was often to no avail and the exclusion would still be considered inapplicable.<sup>27</sup>

In response, most state legislators in the United States passed legislation prohibiting the exclusion when the suicidal took her life two years or more after the policy was issued. This rule is now inscribed in the books of most American states (Tseng, 2004).<sup>28</sup> As a result, US courts have now basically dropped the argument that a suicide is in principle insane (at least insofar as the two-year gap is concerned) and insurance policies are now drafted accordingly.<sup>29</sup> This is exactly a situation where a legislation imposing a prohibition (suicide exclusions are not valid after two years) raised the prospects that judges allow related things not expressly forbidden by legislation (the suicide exclusion being held valid within the two-year period after the policy was issued).

Our model also sheds light on some historical events specifically in the realm of interest rate caps. The debates over interest rate regulation in the United Kingdom in 19th and

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<sup>23</sup> See *Knickerbocker Life Ins. Co. v. Peters*, 42 Md. 414, at 417 (1875).

<sup>24</sup> *Columbian Nat'l Life Ins. Co. v. Wood*, 193 Ky. 395, at 397 (1922). But see *Bigelow v. Berkshire Life Insurance Co.*, 3 Otto 284, at 286-287 (1876) (accepting contractual limitation of liability).

<sup>25</sup> See *New York Life Ins. Co. v. Dean*, 226 Ky. 597, 11 S. W. 2d 417 (1928); *Ladwig v. National Guardian Life Ins. Co.*, 247 N.W. 312 (Wis. 1933); and *Muzenich v. Grand Carniolian Slovenian Catholic Union*, 154 Kan. 537, 119 P 2d 504 (1941). But see *Strasberg v. Equitable Life Assur. Soc. U.S.*, 281 App. Div. 9, at 13-14 (1952); *Dent v. Virginia Mut. Benefit Life Ins. Co.*, 226 A. 2d 166, at 167 (D.C. App. Ct. 1967) (holding a presumption of sanity and ascribing to the plaintiffs the burden of proving insanity of the deceased).

<sup>26</sup> *Mutual Life Insurance Co v. Terry*, 15 Wall. 580, at 591 (1872); *Knickerbocker Life Ins. Co. v. Peters*, 42 Md. 414, at 421 (1875); and *Ladwig v. National Guardian Life Ins. Co.*, 247 N.W. 312, at 314 (Wis. 1933).

<sup>27</sup> See *Equitable Life Assur. Soc. v. Bailey*, 284 S.W. 403, at 404 (1926); and *Christensen v. New England Mut. Life Ins. Co.*, 197 Ga. 807, at 809-812 (1944).

<sup>28</sup> In a few states the legislated exception covers only one year and in a few others there is no such legislation.

<sup>29</sup> See *McKinnon v. Lincoln Benefit Life Company*, 162 Fed. Appx. 223, at 227 (2006); *Mitchell v. American General Life Insurance Company*, 2014 U.S. Dist. LEXIS 93742, at 5-6, 8 (2014); and *Collins v. Unum Life Insurance Company of America*, 2016 U.S. Dist. LEXIS 60628, at 31, 34, 37 (2016).

early 20th century are a case in point. In the context of the ascendance of finance in the 19th Century, in 1854 the British Parliament had passed the Usury Laws Act abolishing all interest rate ceiling in the United Kingdom (Geisst, 2013, pp. 131-133). Yet moved by alleged abuses against debtors, in 1897 the House of Commons appointed a committee to investigate moneylending (Goode, 1982). The report was finalized in 1898 and contained several anecdotal evidences used to substantiate the conclusion that moneylenders were abusing their permission to price credit on market conditions (Goode, 1982, p. 44).<sup>30</sup> In response, parliament enacted the Money-Lenders Act of 1900, which expressly authorized courts to reopen credit transactions when interest or other charges were considered excessive or the terms of the transaction were deemed harsh, unconscionable or inequitable. The Act of 1900 also required moneylenders to be registered with (but not licensed by) the Customs and Excise (Goode, 1982).<sup>31</sup>

The Money-Lenders Act of 1900 was largely ineffectual, first because registration was not followed by any kind of supervision and second because statutory authorization for courts to reopen loan transactions was unnecessary, as history books are full of references to discussions over the legality of interest rates before the enactment of the Act of 1900 (Geisst, 2013, p. 177, noting that interest rates became usurious beyond some “flexible” point even in the absence of a statutory cap). After a brief amendment in 1911, the Money-lenders Act of 1900 was more substantively amended by Money-Lenders Act of 1927. This is where the model advanced in the present article can be useful to reassess history.

The conventional wisdom is that the Moneylenders Acts of 1900 and 1927 are part of a single regulatory wave of anti-usury, pro-debtor policymaking in the United Kingdom (Goode, 1982; Crowther Report, 1972; Geisst, 2013, p. 177). Yet only the Act of 1927 did contain an explicit interest rate threshold, which the Act of 1900 did not, which means that the effects, and perhaps even its motivation, of the 1927 Act may have been different from those of the Act of 1900. The 1927 Act is said to have strengthened the anti-usury objectives of the previous Act of 1900 by requiring licensing (instead of only registration) and by imposing requirements and restrictions as to the seeking of business, formalities of contract and enforcement by moneylenders. Moreover, and crucially for present purposes, the Moneylenders Act of 1927 introduced a presumption that interest rates over 48% were *prima facie* unconscionable. Although this was not a full-fledged interest rate prohibition, it meant that whenever interest rates were above 48% per year the moneylender had the burden of proving that the loan was neither harsh nor unconscionable.

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<sup>30</sup>The report famously included a testimony from a moneylender admitting to have charged 3,000% interest, and of another one that provided credit under 34 different aliases to avoid the notoriety of being an abusive lender (Goode, 1982).

<sup>31</sup>The Money-Lenders Act did not affect clearing banks but only other financiers.



Our model permits to hypothesize that the inclusion of this 48% threshold in the Money-Lenders Act of 1927 may have in fact served, willfully or not, to enlarge credit markets and consolidate market pricing of credit in Britain. The main reason is that before 1927 courts did “reopened” contracts and sometimes upheld standards of fairness in interest rate charges below 48% (Meston, 1968), so it is not unreasonable to imagine that this quasi-interest rate ceiling in fact swayed courts into accepting higher interest rates in money lending transactions. To be true, after 1927 courts did not simply invalidate every contract with interest rates above 48%; there were cases where courts upheld contracts with interest rates as high as 177% (Meston, 1968), so the 48% threshold was indeed read as a presumption and not as a prohibition. But historians recognize that market rates did prevail in money-lending transactions even after 1927, and that the Money-Lenders Act did little to reduce prevailing interest rates (Geisst, 2013, p. 178), which does not demonstrate but is consistent with our model of legislated “prohibitions that permit”.

A similar analysis can be replicated with present-day cases where usury ceilings are first eliminated and subsequently reinstated. For instance, the wave of consumer protection as of the 1960s decade has led several countries in Europe to reinstate usury ceilings for certain kinds of transactions. Examples include overdraft credit and protected housing loans in Spain, credit unions in Ireland, and non-banks in Greece, but there are others. The exact implications of such legislation are unclear, but the conventional wisdom that they in practice served to curb lending has never been demonstrated (Reifner and Schröder, 2012). One of the reasons may be that researchers have consistently failed to take into account the interplay between courts and legislation.

A final point is that the courts’ judgment calls and statutory interpretations can also change over time, and usury provides again a telling example. Many states in the United States have strict usury laws in their books, but based on a Supreme Court decision of 1978 courts now permit nationally chartered banks to apply the lawful interest rate of the lender’s home state independently of the usury laws where the borrower is domiciled. Yet a 2016 decision by the U.S. Court of Appeals for the Second Circuit reversed in part this longstanding position. It held that if a debt is assigned by a national bank to an entity that is not a national bank, then borrowers can raise state usury laws in their favor.<sup>32</sup> This highly publicized decision created much legal uncertainty for lenders and other financial industry firms whose businesses rely on securitizations and bundling of debt. The decision is valid only in the states of the Second Circuit – New York, Connecticut and Vermont – and a pressing question concerns whether other states will follow suit. This court debates

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<sup>32</sup>See *Madden v. Midland Funding, LLC*, 786 F. 3d 246 (2015). The Supreme Court denied certiorari.

illustrate the problem of dispersion in court decisions, to which we now turn.

## 6 Rules and legal uncertainty

We now use our model of contingent judicial deference to study the interaction between a legislated ceiling  $\bar{X}$  and the dispersion of judicial decisions, which is a measure of legal uncertainty. The model in Section 3 implies that adjudicator  $i$  defers to legislation and follows the legislated cap  $\bar{x}$  as long as  $\bar{X} \in (X_{Li}, X_{Hi})$  and decides according to a cap  $\bar{X}_i^* = X_{0i}$  if  $\bar{X} \notin (X_{Li}, X_{Hi})$ . We now parameterize these three thresholds so that, for adjudicator  $i$ ,

$$\begin{aligned} X_{Lid} &= x_{L0} + \varepsilon_i + \nu d \\ X_{Hid} &= x_{H0} + \varepsilon_i + \nu d \\ X_{0id} &= x_{00} + \varepsilon_i + \nu d \end{aligned}$$

where  $x_{L0}$ ,  $x_{H0}$  and  $x_{00}$  are the thresholds that characterize the decision of the ‘median adjudicator’ at an initial point in time ( $d = 0$ ),  $\varepsilon_i$  is an adjudicator’s specific term, distributed with full support between  $-\bar{\varepsilon}$  and  $\bar{\varepsilon}$ ,  $\nu > 0$  is a positive constant and  $d \in \mathbb{R}$  is a preference shifter, common to all adjudicators. We assume that  $x_{L0} - \bar{\varepsilon} > 0$ , so that all adjudicators agree that sufficiently low values of  $x$  should be allowed.

This specification has two important features. First, there is dispersion among adjudicators’ judgements, given by the term  $\varepsilon_i$ , that does not vary in time. Second, there is a preference shifter that does not affect the variance of adjudicator’s opinions, only its mean. One interpretation is that as time goes by, judgments change, and this is captured in the model by the variable  $d$ . The question then is how the legislation affects decisions for different values of  $d$ .

A statute imposes a ceiling on  $x$  denoted by  $\bar{X}$ . For  $d = 0$ , all adjudicators follow the rule as long as  $\bar{x} \in [x_{L0} + \bar{\varepsilon}, x_{H0} - \bar{\varepsilon}]$ . This condition is satisfied by the top line in the example in Figure 9, that shows the bounds for  $X_{Li0}$  and  $X_{Hi0}$ . For any adjudicator  $i$ ,  $\bar{X} \in (X_{Li0}, X_{Hi0})$ .

For a given  $d$ , an adjudicator’s decision can be summarized by her effective threshold for  $x$ , denoted by  $\bar{X}_{id}^*$ , which is the maximum value of  $x$  that adjudicator  $i$  deems acceptable given  $d$  ( $\bar{X}_{id}^*$  may be different from  $\bar{X}$ ).

Naturally, for larger  $d$ , some adjudicators start to reject the rule and follow their own judgment. This generates dispersion in  $\bar{X}_{id}^*$ . The interesting implication of this model is that the dispersion in  $\bar{X}_{id}^*$  is non-monotonic in  $d$ . This result is stated in Proposition 4.

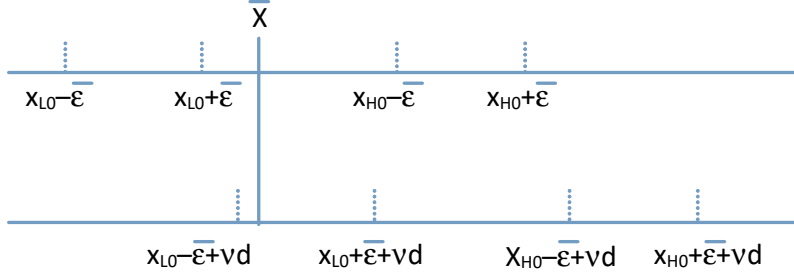


Figure 9: Changing judgments and a fixed rule

**Proposition 4** Assume  $\bar{X} \in [x_{L0} + \bar{\epsilon}, x_{H0} - \bar{\epsilon}]$ . It follows that:

1. For  $d = 0$ , the variance of  $\bar{X}_{id}^*$  is 0, since  $\bar{X}_{id}^* = \bar{X}$  for all  $i$ .
2. For sufficiently large  $d$ , the variance of  $\bar{X}_{id}^*$  equals the variance of  $\varepsilon_i$ , since all adjudicators choose to ignore the rule.
3. For some intermediary value of  $d$ , the variance of  $\bar{X}_{id}^*$  is larger than the variance of  $\varepsilon_i$ , implying that the rule induces dispersion.

**Proof.** See the appendix. ■

The first statement follows from the assumption that  $\bar{X} \in [x_{L0} + \bar{\epsilon}, x_{H0} - \bar{\epsilon}]$ . The second statement is a direct implication of the assumptions that  $x_{L0} - \bar{\epsilon} > 0$ , since for large enough  $d$ ,  $X_{Lid}$  will be larger than  $\bar{X}$  for all  $i$ , so all adjudicators will follow their own judgment,  $\bar{X}_{id}^* = x_{0id} + \varepsilon_i + \nu d$  for all  $i$ . Hence, the dispersion in  $\bar{X}_{id}^*$  will be equal to the dispersion in  $\varepsilon_i$  (since  $x_{0id}$  and  $\nu d$  are the same for all  $i$ ).

The interesting result is the third statement of Proposition 4. For some intermediary values of  $d$ , the existence of a rule actually makes adjudicators' decisions *more* disperse. Figure 10 shows dispersion of  $\bar{X}_{id}^*$  as a function of  $d$ .

The bottom line of Figure 9 helps to explain the intuition for this increase in dispersion. In this case, the lowest value of  $X_{Lid}$ ,  $x_{L0} - \bar{\epsilon} + \nu d$ , is just a little bit smaller than  $\bar{X}$ . Hence  $X_{Lid} > \bar{X}$  for the majority of adjudicators. For them,  $\bar{X}_{id}^* = x_{0id}$ . However, for the few agents with  $X_{Lid} < \bar{X}$ , the rule is deemed reasonable, so  $\bar{X}_{id}^* = \bar{X}$ . Since their  $X_{Lid}$  is very close to  $\bar{X}$ , their effective threshold  $\bar{X}_{id}^*$  is smaller than  $x_{0id}$ . Since the agents with the lowest  $x_{0id}$  are the ones whose decisions follow an even lower effective threshold,  $\bar{X}$ , we get that the dispersion in effective thresholds is higher than in the case  $t$  is very large.

In words, in the situation depicted in the bottom line of Figure 9, most adjudicators are ignoring the rule and following their own judgment. However, those who would choose

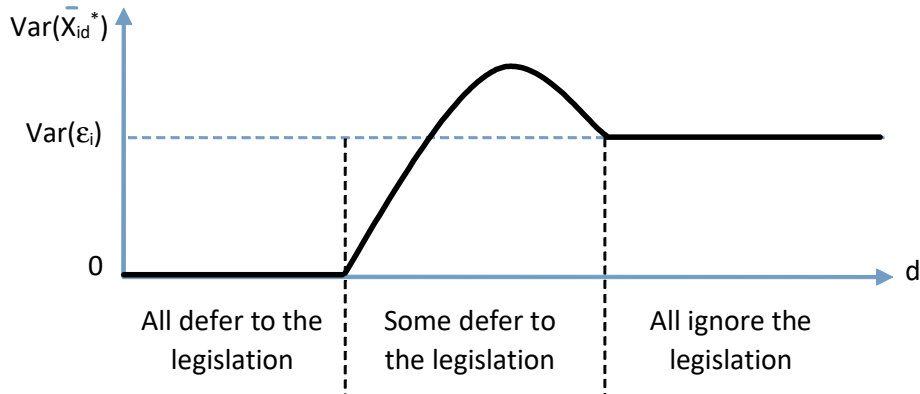


Figure 10: Legal uncertainty as a function of  $d$

the lowest thresholds for  $x$  in the absence of a rule still find the rule reasonable, though more strict than what they would choose in the absence of a rule. Hence the legislation is inducing those with a preference for a lower  $\bar{X}_{id}^*$  to choose an even lower threshold without affecting those who prefer a larger  $\bar{X}_{id}^*$ .

When  $X_{Lid} > \bar{X}$  for some but not all adjudicators, so that some apply the legislation and others don't, two effects are in place: (i) the rule induces conformity within those who follow the rule; (ii) the rule might increase the gap between those who follow the rule and those who choose to ignore it. When  $X_{Lid} > \bar{X}$  for very few adjudicators, the former effect dominates. However, when  $X_{Lid} > \bar{X}$  for the vast majority adjudicators, the second effect dominates, so the variance of  $\bar{X}_{id}^*$  is certainly larger than the variance of  $\epsilon_i$ . Intuitively, inducing conformity within those who follow the rule has a negligible effect on the dispersion of  $\bar{X}_{id}^*$  if too few agents follow the rule.<sup>33</sup>

## 7 Final remarks

Legislation that seems to have been enacted by well-informed and well-intentioned legislators is more likely to be followed by courts. Building on this simple premise, we proposed a model of judicial deference and derived implications about the effect of legislation on the probability of statutory enforcement and on the dispersion of judicial decisions within a legal system. The key result of the model is the non-monotonic relation between legislated bounds and bounds effectively imposed by courts.

This non-monotonicity resonates with the empirical findings in Bindler and Hjalmarsson (2016). They study the effects of changes in criminal legislation in the United Kingdom

<sup>33</sup>In an intermediary region, any effect can dominate. Hence, the variance of  $\bar{x}_{it}^*$  may be larger than the variance of  $\epsilon_i$  for a large set of values of  $t$ .

(and in particular the abolition of capital punishment in the 1800s) on the behavior of juries. Their main result is that reductions in punishment severity lead to increases in the chances of conviction. Hence the expected punishment might be non-monotonic in the legislated punishment. Similarly, experimental research has shown that the enactment of caps on the amount that juries can establish as damages increases the awards in low-value cases that would otherwise generate smaller awards (Hinsz and Indahl, 1995; and Robbennolt and Studebaker, 1999).<sup>34</sup>

The model raises additional theoretical and applied questions. One theoretical question concerns the dynamics of courts and legislatures concerning prohibitions. We showed that once courts are considered, the enactment of a prohibition to contract can create a permission to contract. However, our model is static, while the examples discussed suggest that there may be a dynamic component in the interplay of courts and legislatures.

As to the applied aspects, one crucial question concerns feasibility. This article should not be read as an endorsement of usury laws, but as a study of their economic effects once court discretion is factored into credit models. The exercise of judgment calls by courts can cause the enactment of usury laws to enlarge credit markets as long as market interest rates are routinely viewed by courts as “excessive”. This does not mean that the model is valid only for high interest rates jurisdictions. Japan, for instance, is worldwide famous for its low interest rates, yet usury ceilings have become highly contentious in its consumer markets (Ramseyer, 2013). Conversely, some countries with much higher interest rate levels seem to have reduced the problem of interest rate litigation by adopting flexible and higher interest rate ceilings. For instance, in Slovenia caps range from as high as 453% per year for small loans to 13.2% for long-term loans (data of 2010; see Reifner and Schröder, 2012, p. v). The message then is that circumstances matter.

Second, the success of usury laws depends crucially on legislative precision, which is difficult to attain due to the well-known problems of politicians motivation and costly information. In particular, dispersion in court decision-making can be particularly problematic where courts apply different treatment to different kinds of borrowers and transactions, because in that case a flat interest rate ceiling may curtail the lenders’ ability to charge risk-adjusted rates. An alternative to deal with this problem is to create various classes of interest rate ceilings, as is now common practice in various countries, but legislated error tends to grow with statutory complexity.

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<sup>34</sup>In the literature on damages, the non-monotonic relation between the legislated ceilings and the awards effectively imposed is attributed to anchoring, the cognitive bias of relying too much on the piece of information that is offered first (such as a statutory damage cap). However, unlike the model of legal uncertainty developed in section 6, anchoring can hardly explain by itself the result found by Robbennolt and Studebaker (1999) that the passing of a legislated cap on punitive damages can also increase the variance of court decisions.

Beyond the problem of usury ceilings, analytically similar concerns can be expected to exist with any kind of legislated prohibitions. We expect that therein lies the main value of this article.

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## A The model with an unbounded support for the ceiling

In the model of Section 3, the interest rate ceiling has to be a number between  $\bar{x}_L$  and  $\bar{x}_H$  with  $\bar{x}_H < \infty$ . This is incompatible with the fact that in some countries, there is no ceiling for interest rates in credit contracts. Here we show a simple modification of the model that would allow for beliefs with a positive mass on the ideal ceiling being infinite (and on the ideal ceiling being zero as well).

There is a one-dimensional variable  $\theta$  that summarizes what needs to be known about the issue. This variable  $\theta$  can assume values between 0 and 1. In case of interest rate ceilings,  $\theta$  would be a function of several economic and (possibly) moral factors, including the market power of banks, borrowers' propensity to take unconscionable loans, moral judgements about individuals' right to sign private contracts or about limits to interest rates, etc.

Adjudicators do not know the value of  $\theta$ . Adjudicator  $i$  is characterized by her beliefs about  $\theta$ , which depends on her information and, possibly, on her moral judgements. Her beliefs about  $\theta$  are represented by a continuous density function  $f_i$ . We assume  $f_i$  is strictly quasi-concave and the density of the median  $f_i(\theta_i^{med})$  is larger than 1 as in the model of Section 3.

Denote by  $\bar{x}$  the maximum admissible value of  $x$  (an interest rate ceiling for example). We posit that  $\bar{x}$  is an increasing function of  $\theta$ . More specifically, the ‘correct’ ceiling  $\bar{x}$  is given by:

$$\bar{x} = \begin{cases} 0 & \text{for } \theta \leq \theta_L \\ \xi(\theta) & \text{for } \theta \in (\theta_L, \theta_H) \\ \infty & \text{for } \theta \geq \theta_H \end{cases} \quad (10)$$

where  $0 \leq \theta_L < \theta_H \leq 1$ ,  $\xi' > 0$ ,  $\lim_{\theta \rightarrow \theta_L} \xi(\theta) = 0$  and  $\lim_{\theta \rightarrow \theta_H} \xi(\theta) = \infty$ .

As in Section 3, there are two types of legislators. Here, the ‘good’ legislator knows  $\theta$  and chooses  $\bar{X}$  given by (10); the ‘bad’ legislator is a clueless agent that draws a random  $y$  from a uniform distribution between 0 and 1 and chooses  $\bar{X}$  as if  $\theta$  were equal to  $y$ . All other assumptions are as in the model of Section 3.

In this model, a version of Proposition 1 also holds (the proof is available upon request). Adjudicator  $i$  will defer to the legislation whenever  $\bar{X} \in [X_{Li}, X_{Hi}]$  with  $0 \leq X_{Li} < X_{Hi} \leq \infty$  and will otherwise ignore the legislation and follow a ceiling  $\bar{X}_i^* = X_{0i}$ . Propositions 2, 3 and 4 then follow from this result.

## B A model of unconstrained adjudicators

We now modify the model from Section 3 in the following way: now, instead of defer to the legislation as long as  $\Pr(\text{good}|\bar{X}) > \alpha$ , the adjudicator calculates the probability that the transaction should be allowed, considering her own prior information and what she can learn from the legislation, and decides depending on whether the probability that the transaction should be allowed is larger than 0.5.<sup>35</sup> This is thus a model of a Bayesian adjudicator facing no institutional constraints. For the sake of simplicity, we also assume that the median of the distribution  $f_i$  coincides with the mode, i.e., the value of  $\bar{x}$  that maximizes  $f_i(\bar{x})$  is  $\bar{x}_i^{med}$ .

All other assumptions of the original model are maintained. In particular, the legislator who enacted the statute can be either ‘good’ or ‘bad’ and the legislation provides information about it. Hence as before, upon observing a legislated ceiling equal to  $\bar{X}$ ,  $\Pr(\text{good}|\bar{X})$  is given by (1). Owing to the assumption that  $\bar{x}_i^{med}$  is also the mode of the distribution of  $f_i$ ,  $\Pr(\text{good}|\bar{X})$  is maximized at  $\bar{X} = X_{0i}$ . Owing to the quasiconcavity of  $f_i$ , we have that  $\Pr(\text{good}|\bar{X})$  is decreasing in  $(X_{0i} - \bar{X})$  for  $\bar{X} < X_{0i}$  and decreasing in  $(X_{0i} - \bar{X})$  for  $\bar{X} > X_{0i}$ .

Denote by  $J_i(x)$  the probability that a contract characterized by variable  $x$  should be allowed, from the point of view of adjudicator  $i$ , based only on her prior knowledge  $f_i$ . The function  $J_i$  is given by:

$$J_i(x) = 1 - F(x) \quad (11)$$

Hence  $J_i$  is decreasing in  $x$  and  $J_i(X_{0i}) = 0.5$ .

<sup>35</sup>The probability threshold of 0.5 is without loss of generality.

Denote the legislation establishing a ceiling  $\bar{X}$  by  $\ell$  so  $\ell(x) = 1$  for  $x \leq \bar{X}$  and  $\ell(x) = 0$  otherwise. Since an adjudicator aims at making the correct decision, she deems a contract valid as long as the posterior probability that  $x$  should be allowed, given  $\bar{X}$ , is larger than 0.5, i.e., if

$$\Pr(x|\bar{X}) = \Pr(\text{good}|\bar{X}) \ell(x) + (1 - \Pr(\text{good}|\bar{X})) J(x) \geq 0.5 \quad (12)$$

For example, if  $\ell(x) = 1$ , the posterior probability that  $x$  should be allowed,  $\Pr(x|\bar{X})$ , is given by the probability that the legislator is informed (first term in the RHS of (12)) plus the probability that the legislator is uninformed but  $x$  should indeed be allowed (second term of (12)). Thus the adjudicator is effectively weighing the legislation and her own judgment. The key implication of (12) is that the weight on the legislation decreases as  $\bar{X}$  gets farther away from  $X_{0i}$ . In other words, the weights attributed to each factor depend on how the legislation fits the adjudicator's judgment.

### B.1 The adjudicator's decision

We now show that, as in our baseline model,  $\bar{X}$  has a non-monotonic effect on the threshold effectively followed by the adjudicator, denoted by  $\bar{X}_i^*$ .

Consider an adjudicator represented by  $J_i$ . In the case depicted in Figure 11, the prescription of the legislation is identical to what she would decide in the absence of any rule. Hence  $\Pr(\text{good}|\bar{X})$  is at its maximum attainable value.

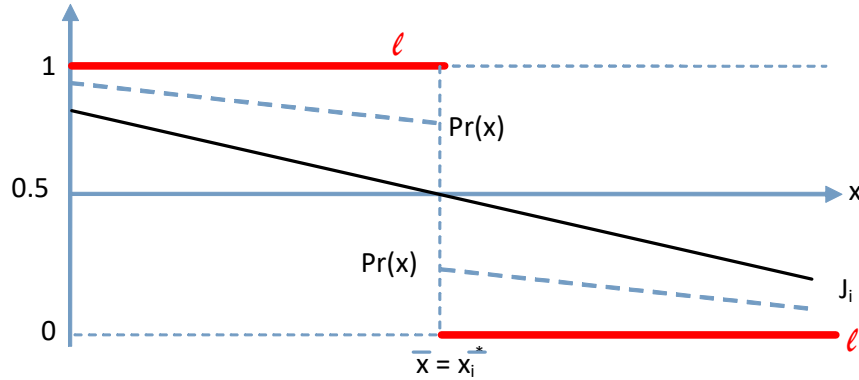


Figure 11: Legislation and judgement coincide

$\Pr(x|\bar{X})$  is a weighted average between  $\ell$  and  $J_i$ , hence it is larger than 0.5 for  $x < \bar{X}$  and smaller than 0.5 for  $x > \bar{X}$ .

Now, consider a larger threshold, as depicted in Figure 12. This cap allows for larger values of  $x$  than the adjudicator would choose, in the absence of any legislation. Here,  $\Pr(\text{good}|\bar{X})$  is smaller than in the previous case. Nevertheless, in this example,  $\Pr(x|\bar{X})$  is still larger than 0.5 for  $x < \bar{X}$  and negative for  $x > \bar{X}$ . The adjudicator defers to the legislation.



An increase in  $\bar{X}$  by  $dx$  would have two effects: (i) it would bring  $\bar{X}$  further away from  $X_{0i}$  and thus reduce  $\Pr(\text{good}|\bar{X})$  by an infinitesimal amount; (ii)  $\Pr(\bar{X} + dx|\bar{X} + dx)$  would be the average between  $J(\bar{X} + dx)$  and 1 (and not 0 as before). Since  $\Pr(x|\bar{X}) > 0.5$ , as the change in  $\Pr(\text{good}|\bar{X})$  is infinitesimal, this increase in  $\bar{X}$  by  $dx$  would raise  $\bar{X}_i^*$  by  $dx$  as well.

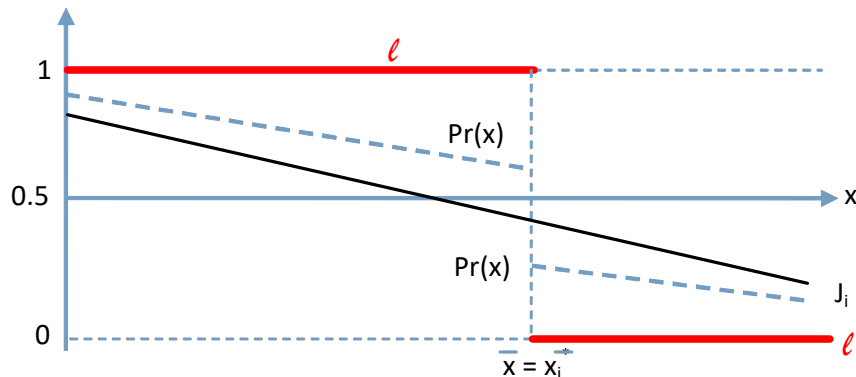


Figure 12:  $\bar{x} > x_{0i}$ ; the adjudicator follows the letter of the law

However, if  $\Pr(x|\bar{X}) < 0.5$ , an increase in  $\bar{X}$  by  $dx$  would actually reduce  $\bar{X}_i^*$ . This case is depicted in Figure 13. This legislation is more lenient than in Figure 12, so  $\Pr(\text{good}|\bar{X})$  is smaller than in the previous case. In this example,  $\Pr(x|\bar{X}) < 0.5$  for some  $x < \bar{X}$ , so the adjudicator does not follow the letter of the law.

An increase in  $\bar{X}$  by  $dx$  would reduce  $\Pr(\text{good}|\bar{X})$  and would have no effect on  $\ell$  in a neighborhood of  $\bar{X}_i^*$  (since  $\ell(x) = 1$  for  $x$  in this neighborhood). Hence, this increase in  $\bar{X}$  by  $dx$  would decrease  $\Pr(x|\bar{X})$  for  $x < \bar{X}$ . This implies that  $\Pr(x|\bar{X})$  would cross the line  $x = 0.5$  at a smaller value of  $x$ . Therefore, in this case,  $\bar{X}_i^*$  is actually decreasing in  $\bar{X}$ .

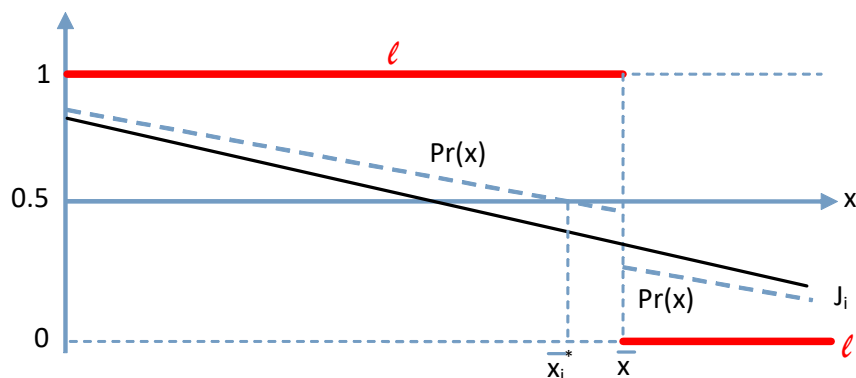


Figure 13:  $\bar{x} > x_{0i}$ ; the adjudicator does not follow the letter of the law

The following proposition summarizes an adjudicator's decision.

**Proposition 5** Consider a cap  $\bar{X} \in [\bar{x}_L, \bar{x}_H]$  so that  $\ell(x) = 1$  for  $x \leq \bar{X}$  and  $\ell(x) = -1$  otherwise.

1. The adjudicator deems  $x$  acceptable if and only if  $x \leq \bar{X}_i^*$  for some  $\bar{X}_i^* \in [\bar{x}_L, \bar{x}_H]$ .
2. The adjudicator applies the letter of the law for  $\bar{X} \in [\bar{X}_L, \bar{X}_H]$ , with  $\bar{x}_L \leq \bar{X}_L < X_{0i} < \bar{X}_H \leq \bar{x}_H$  and does not apply the letter of the law for  $\bar{X}$  outside this interval.
3. If  $\bar{X}_L > \bar{x}_L$ , then  $\bar{X}_i^*$  is strictly decreasing in  $\bar{X}$  for  $\bar{X} \in [\bar{x}_L, \bar{X}_L]$ .
4. If  $\bar{X}_H < \bar{x}_H$ , then  $\bar{X}_i^*$  is strictly decreasing in  $\bar{X}$  for  $\bar{X} \in [\bar{X}_H, \bar{x}_H]$ .

**Proof.** See the appendix. ■

The second point of Proposition 5 states that the adjudicator follows the letter of the law if the legislation is close enough to her own judgment but might not follow it the disagreement between  $\ell$  and  $J_i$  is large enough. The third and fourth points of the proposition state that outside the region where the adjudicator follows the letter of the law, the adjudicator's effective interest rate ceiling  $\bar{X}_i^*$  is actually decreasing in  $\bar{X}$ . For  $\bar{X} \notin [\bar{X}_L, \bar{X}_H]$ , a usury law with a lower interest rate ceiling actually leads to a higher effective interest rate ceiling  $\bar{X}_i^*$ .

Figure 5 illustrates how a adjudicator's effective threshold  $\bar{X}_i^*$  behaves as a function of the ceiling  $\bar{X}$  prescribed by the legislation:

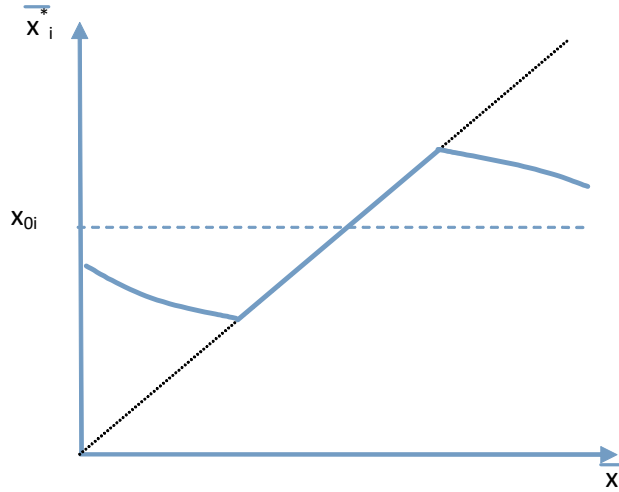


Figure 14: An adjudicator's effective interest rate ceiling

Intuitively, if  $\bar{X}$  is just a bit larger than  $X_{0i}$ , the adjudicator defers to the legislation, since the weight she attributes to the legislation is large enough to offset her mild disagreements with the statute. As  $\bar{X}$  goes up, the adjudicator gives less and less weight to the law. Once we reach the region of no deference to the legislation, the adjudicator's own interest rate ceiling  $\bar{X}_i^*$  becomes decreasing in  $\bar{X}$  because the weight on the legislation is decreasing in  $(\bar{X} - X_{0i})$ . The intuition for a smaller  $\bar{X}$  is the same.

## C Proofs

### C.1 Proof of Proposition 1

*First statement:* Recall  $X_{Li} = \sup \{x | \Pr(\text{good}|\bar{X}) \leq \alpha \text{ for all } \bar{X} \leq x\}$ . Hence  $X_{Li} < X_{0i}$  because:  $f_i(\bar{x}_i^{\text{med}}) > 1/(\bar{x}_H - \bar{x}_L)$  by assumption; using (1) and  $X_{0i} = \bar{x}_i^{\text{med}}$ , we get  $\Pr(\text{good}|X_{0i}) > \pi$ , and since  $\pi > \alpha$ ,  $\Pr(\text{good}|X_{0i}) > \alpha$ .

Owing to the strict quasi-concavity of  $\Pr(\text{good}|\bar{X})$ , if  $\lim_{x \rightarrow X_{Li}} \Pr(\text{good}|x) \leq \alpha$ , then  $\Pr(\text{good}|x) < \alpha$  for  $x \in [\bar{x}_L, X_{Li})$ . The strict quasi-concavity of  $\Pr(\text{good}|\bar{X})$  also implies that  $\Pr(\text{good}|x) > \alpha$  for  $x \in (X_{Li}, X_{0i})$ . Hence the likelihood of a good legislator is smaller than  $\alpha$  when  $x \leq X_{Li}$ , but is not rejected if  $x \in [X_{Li}, X_{0i}]$ .

A similar argument shows that the likelihood of a good legislator is smaller than  $\alpha$  when  $x \geq X_{Hi}$ , but not if  $x \in [X_{0i}, X_{Hi}]$ .

*Second statement:* If  $\bar{X} \notin [X_{Li}, X_{Hi}]$ , the adjudicator chooses what is more likely to be the correct decision according to her prior  $f_i$  only. The probability that a contract characterized by variable  $x$  should be allowed is then given by the function  $J_i$  in 11, so  $J_i(x)$  is larger than half if and only if  $x < X_{0i}$ .

### C.2 Proof of Proposition 2

Using Proposition 1, for  $x < \bar{X}_1 < \bar{X}_2$ , the contract will only be judged illegal by adjudicator  $i$  if (i) the legislation is rejected and (ii)  $x > X_{0i}$ . If the legislation is rejected because the cap  $\bar{X}$  is below  $X_{Li}$ , the contract will nevertheless be deemed legal because  $x < \bar{X} < X_{Li} < X_{0i}$ . If the legislation is rejected because the cap exceeds  $X_{Hi}$ , then the contract will be deemed illegal if  $x > X_{0i}$ . The probability  $p(x|\bar{X})$  is thus equal to the mass of adjudicators with  $x > X_{0i}$  and  $\bar{X} > X_{Hi}$ . This mass is weakly increasing in  $\bar{X}$ , hence if  $\bar{X}_1 < \bar{X}_2$ ,  $p(x|\bar{X}_2) \geq p(x|\bar{X}_1)$ . This inequality will be strict if there is some adjudicator  $i$  such that  $x > X_{0i}$  and  $\bar{X}_2 > X_{Hi}$  but  $\bar{X}_1 \leq X_{Hi}$ . This yields the first statement for  $x < \bar{X}_1 < \bar{X}_2$  and the second statement.

A similar argument yields the first statement for  $\bar{X}_1 < \bar{X}_2 < x$  and the third statement.

### C.3 Proof of Proposition 3

*First statement:* the condition in (4) implies that when lawsuits occur, the maximum interest rate  $R^{\max}$  is such that

$$R^{\max} > 1 + \frac{c}{p(R^{\max})}$$

Using (6), this implies that

$$p(R^{\max}) > \frac{c}{B-1} \tag{13}$$

but using (6), the condition  $R^{\max} > B$  can also be written as (13).

*Second statement:* in case interest rates are capped at  $B - c$  and (8) holds, when interest rates are equal to  $B - C$ , the condition for no lawsuits in equilibrium in (4) does not hold and is slack.

By continuity, there is some  $\epsilon > 0$  such that a cap in interest rates equal to  $B - c + \epsilon$  yields no lawsuits in equilibrium when interest rates are  $B - c + \epsilon$  (and thus no lawsuits for interest rates not larger than  $B - c + \epsilon$ ). That means that project  $j$  is financed as long as  $\rho_j \geq 1/(B - c + \epsilon)$ . In the absence of a usury law, lawsuits occur in equilibrium and project  $j$  is financed only if  $\rho_j \geq 1/(B - c)$ . Since  $1/(B - c + \epsilon) < 1/(B - c)$ , capping interest rates at  $B - c + \epsilon$  increases the volume of credit in the economy.

*Third statement:* in case interest rates are capped at  $B$  and (9) holds, the condition for no lawsuits in equilibrium in (4) does not hold for any  $R \leq B$ . This implements the equilibrium described in Section 4.1.

#### C.4 Proof of Proposition 4

The first statement follows from the assumption.

*Second statement:* for  $d > (\bar{X} - x_{L0} + \bar{\epsilon})/\nu$ ,  $X_{Lid} > \bar{X}$  for all  $i$ , hence all adjudicators reject the law, so  $\bar{X}_{id}^* = X_{0id} = x_{00} + \varepsilon_i + \nu d$ , thus  $Var(\bar{X}_{id}^*) = Var(\varepsilon_i)$ .

*Third statement:* Consider the case where  $d = (\bar{X} - x_{L0} + \bar{\epsilon})/\nu - \eta$ , for some small  $\eta > 0$ , so that  $\eta < (x_{00} - x_{L0})/\nu$ . For those with  $\varepsilon_i < -\bar{\epsilon} + \nu\eta$ , it must be that  $\bar{X} < X_{Lid}$ , so they reject the rule and decide according to  $\bar{X}_{id}^* = X_{0id}$ . For those with  $\varepsilon_i \geq -\bar{\epsilon} + \nu\eta$ , it must be that  $\bar{x} \geq X_{Lid}$ , so  $\bar{X}_{id}^* = \bar{x}$ . Since  $\nu\eta < (x_{00} - x_{L0})$ ,  $\bar{X} < x_{0id}$ . Hence the distribution of  $\bar{X}_{id}^*$  is the distribution of  $X_{0id}$  with the lowest values of  $X_{0id}$  replaced by  $\bar{x}$ , which is smaller than the smallest  $X_{0id}$ .

#### C.5 Proof of Proposition 5

*First statement:* Since  $\ell$  and  $J_i$  are both weakly decreasing in  $x$  and  $\Pr(\text{good}|\bar{X})$  is independent of  $x$ ,  $\Pr(x|\bar{X})$  is weakly decreasing in  $x$ . If  $\Pr(x|\bar{X}) \geq 0.5$  for all  $x$ ,  $\bar{X}_i^* = \bar{x}_H$ . Otherwise, call  $\bar{X}_i^*$  the maximum value of  $x$  such that  $\Pr(x|\bar{X}) \geq 0.5$  and we get that  $\Pr(x|\bar{X}) \geq 0.5$  if and only if  $x \leq \bar{X}_i^*$ .

*Second statement:* For  $\bar{X}$  in a neighborhood of  $X_{0i}$ ,  $J_i(x)$  is close to 0.5, so a continuity argument shows that the adjudicator follows the legislation, with  $\Pr(x|\bar{X}) > 0.5$  if and only if  $x \leq \bar{X}$ . Moreover, for  $\bar{X} < X_{0i}$ ,  $\Pr(x|\bar{X}) > 0.5$  since  $\Pr(x|\bar{X})$  is the weighted average between  $\ell(\bar{X})$ , which is equal 1, and  $J_i(\bar{X})$ , which is larger than 0.5.

Up to which point  $\bar{X}$  do we have  $\Pr(x|\bar{X}) \geq 0.5$ ? Owing to the quasi-concavity of  $f_i$ ,  $\Pr(\text{good}|\bar{X})$  is decreasing in  $\bar{X}$  for  $\bar{X} > X_{0i}$ . Moreover,  $J_i(\bar{X})$  is also weakly decreasing in  $\bar{X}$  for  $\bar{X} > X_{0i}$ . Hence, using (12),  $\Pr(x|\bar{X})$  is weakly decreasing in  $\bar{X}$  for  $\bar{X} > X_{0i}$ . Either  $\Pr(x|\bar{X}) \geq 0.5$  for all  $x \in [X_{0i}, x_H]$  (in which case we define  $\bar{X}_H = \bar{x}_H$ ) or there is some maximum value of  $\bar{X}$ , call it  $\bar{X}_H$ , that satisfies  $\Pr(x|\bar{X}) \geq 0.5$ .

Since  $J_i$  is decreasing in  $x$ , as long as  $\Pr(x|\bar{X}) \geq 0.5$ , it must be that  $\Pr(x|\bar{X}) \geq 0.5$  for  $x \leq \bar{X}$ . It follows that adjudicator  $i$  deems legal any  $x \leq \bar{X}$  as long as  $\bar{X} \leq \bar{X}_H$ , with  $\bar{X}_H \in [X_{0i}, x_H]$ .

For  $\bar{X} > X_{0i}$ ,  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) < 0.5$  since  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X})$  is the weighted average between  $\ell(\bar{X} + \epsilon)$ , which is equal 0, and  $J_i(\bar{X} + \epsilon)$ , which is smaller than 0.5.

Up to which point  $\bar{X}$  do we have  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) < 0.5$ ? For  $\bar{X}$  in a neighborhood of  $X_{0i}$ , the adjudicator follows the legislation, hence  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) < 0.5$ . Since  $\Pr(\text{good} | \bar{X})$  is increasing in  $\bar{X}$  for  $X_{0i} < \bar{X}$ ,  $1 - \Pr(\text{good} | \bar{X})$  is decreasing in  $\bar{X}$  for  $X_{0i} < \bar{X}$ . Moreover,  $J_i$  is decreasing in  $x$ . Using (12), we get that  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X})$  is decreasing in  $\bar{X}$  for  $\bar{X} > X_{0i}$ . Thus either  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) < 0.5$  for all  $x \in [\bar{x}_L, X_{0i}]$  (in which case we define  $\bar{X}_L = \bar{x}_L$ ) or there is some minimum value of  $\bar{X}$ , call it  $\bar{X}_L$ , that satisfies  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) \leq 0.5$ .

Since  $J_i$  is decreasing in  $x$ , as long as  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) < 0.5$ , it must be that  $\Pr(x | \bar{X}) < 0.5$  for  $x > \bar{X}$ . It follows that adjudicator  $i$  deems illegal any  $x > \bar{X}$  as long as  $\bar{X} > \bar{X}_L$ , with  $\bar{X}_L \in [0, X_{0i}]$ .

*Third statement:* For  $\bar{X} < \bar{X}_L$ ,  $\lim_{\epsilon \rightarrow 0^+} \Pr(\bar{X} + \epsilon | \bar{X}) > 0.5$ . Using (12), clearly  $\Pr(x | \bar{X}) > 0.5$  for  $x \leq \bar{X}$ . Since  $J_i$  is decreasing in  $x$ , the effective threshold  $\bar{X}_i^*$  is the maximum value that solves  $\Pr(\bar{X}_i^* | \bar{X}) = 0.5$ . We know it exists and  $\bar{X}_i^* \in (\bar{X}, X_{0i}]$ , because  $\Pr(X_{0i} | \bar{X}) < 0.5$  for  $\bar{X} < X_{0i}$  (since  $J_i(X_{0i}) = 0.5$  and  $\ell(X_{0i}) = 0$ ). Owing to the strict quasi-concavity of  $f_i$ ,  $\Pr(\text{good} | \bar{X})$  is strictly increasing in  $\bar{X}$  for  $\bar{X} < X_{0i}$ . Using (12), we get that an increase in  $\Pr(\text{good} | \bar{X})$  reduces  $\Pr(x | \bar{X})$  for  $x > \bar{X}$ , hence it decreases the value  $\bar{X}_i^*$  that solves  $\Pr(\bar{X}_i^* | \bar{X}) = 0.5$ . The proof of the *fourth statement* is analogous.