Permitting prohibitions*

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February 2022

Abstract

We propose a model where the probability that courts will enforce a statute is endogenous to the statute itself. We obtain, first, that the enactment of legislation prohibiting something might raise the probability that courts will allow related things not expressly forbidden. We call that a 'permitting prohibition' and discuss examples that are consistent with the model. Second, we obtain that dispersion of court decisions might be greater with legislation that commands little court deference, than with legislation that commands none. Thus, within a certain range, legislation improvement might trade-off with court predictability.

Keywords: adjudication; courts; prohibitions; legal uncertainty.

Jel Classification: K41, K22, K12.

*We thank the editor William Hubbard, one thoughtful anonymous referee, Paulo Azevedo, Klenio Barbosa, Laurence Claus, Robert Cooter, Juan Dubra, Jeff Gordon, Zohar Goshen, Kate Judge, Adi Leibovitch, Caio Machado, Mariana Pargendler, Katarina Pistor, Ariel Porat and seminar participants at the 28^{th} Annual Meeting of the American Law and Economics Association, UC Berkeley, Columbia, U Montevideo, U San Diego and Sao Paulo School of Economics – FGV for helpful comments and suggestions. We also thank Mark Leinauer for excellent research assistantship. Guimaraes gratefully acknowledges financial support from CNPq.

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1 Introduction

Legislative activity and common law developments often complement each other in the same policy space. Consider the problem of restricting the exercise of freedoms – of creating prohibitions, which is our focus in this article. On the one hand, legislation may impose relevant prohibitions. For instance, it can prohibit charging interest above a certain limit, collecting payments during a pandemic, or disclosing embarrassing private facts about other people. On the other hand, even in the absence of such types of legislation, courts may resort to Common Law doctrines and principles to impose the same kinds of prohibitions. For instance, they may deem that charging interest above a certain threshold is "unconscionable", that collecting payments during a pandemic is barred by the doctrines of "impracticability" or "impossibility", or that certain disclosures of private information offend the subjects' "right to privacy".

At the same time, courts sometimes compete with, rather than complement, legislators in the given policy space. That happens in particular when courts tussle with the legislation, rather than enforce it. For instance, courts can overturn legislation (through judicial review) or interpret it out of existence – but then neutralize it while updating textual meaning, narrowing the interpretation, imposing overly burdensome thresholds, raising restrictive standing rules, deciding it to be merely declaratory, and so on. As can be seen, courts evaluate the legislated 'rules of the game' before applying them to concrete cases, and therefore deference to legislators is not automatic. Thus, legislation is less likely to be enforced when courts strongly disagree with it.

The fact that courts meddle with public policy is well documented; the focal question in law and economics is whether courts do so in light of strictly legal reasons, or are motivated by ideology, self-interest or politics. Across the board, however, the assumption is that in forming their conviction, judges are simply deploying their prior knowledge, which remains intact throughout. Learning – the idea that courts preferences can be completed or changed – is hardly a part of the conversation. As such, the prevailing models do not concern themselves with how preferences form, and tend to focus upon those votes for which courts actually have a preferred outcome prior to the case (should schools be desegregated? Do corporations have the right to religious freedom? Etc.).

However, there are many cases in which the boundaries within which a freedom can be exercised are highly subjective, and judges do not have a clearly defined, preferred outcome. For instance, most judges may well believe that charged interest becomes unconscionable at some point, but they have no clearly defined preference for the exact value of that point. When courts do not have clearly defined priors, how do they arrive at their preferred

estimation of the boundary? And what difference does that make?

This paper studies these questions. Our starting point is that judges not only react to, but also learn from, legislation. This means that each statute contains useful information for courts to decide whether to defer to the legislator or not. Legislation thus signals to courts something about its own appropriateness. Accordingly, courts learn from the legislation. The learned lessons are however unclear. Legislation is often crafted by experts and reflects a tolerable balance of powers and views in society. But sometimes legislation crosses certain lines and should not be enforced. To tell one situation from the other, judges have to decipher the signal begotten from the statute. Hence the probability that a statute will be enforced in court is endogenous to the statute itself. This framework 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 to the courts whether it has been appropriately designed.[1] Adjudicators use their knowledge to assess the legislation. Formally, they learn about the 'type of legislator': legislation from the 'good legislator' should always be followed but the 'bad legislator' is misinformed. The larger the distance between the legislation and what an adjudicator would expect from a 'good legislator', the larger is the likelihood that the statute was enacted by a 'bad legislator' and should be rejected. As a result, the weight of the legislation on the adjudicator's decision decreases in the distance between the legislation and the adjudicator's prior beliefs. In equilibrium, the adjudicator will often enforce legislation as intended by the legislators even if it does not reflect the adjudicator's preferred policy choice; occasionally, however, the adjudicator will find the statute unconstitutional, or read an exception into the statute, or find an alternative interpretation with the practical effect of bypassing the legislator.[2]

If the average error from bad legislators is sufficiently large, the model yields a non-monotonic relation between legislated prohibitions and prohibitions effectively imposed by adjudicators. Hence the enactment of a more restrictive statute might lead adjudicators to uphold a more lenient rule. For instance, the enactment of a statute that prohibits smoking beyond a certain point can make it more likely that adjudicators deem smoking before that same point as permitted. Similarly, a statute that caps interest rates in private contracts at $x\%$ reduces the odds that courts will find unconscionable those contracts bearing interest rates of $(x - \varepsilon)\%$. In short, the enactment of a certain cutpoint by the legislator can in

[1] We are thus assuming away the problem of statutory ambiguity. On that topic, see Farnsworth et al. (2010).

[2] We realize that courts sometimes 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.

practice have the effect of causing courts to start permitting certain things that are below the legislated cutpoint and that were previously considered illegal by the courts. We call situations of that sort as 'permitting prohibitions', because the permission is implicitly created by the enactment of a prohibition.

In order to understand the mechanism behind permitting prohibitions, consider the case of statutory interest caps, popularly known as "usury laws". Absent usury laws, very high interest rates are not prohibited. But a credit contract bearing interest rates of, say, 1000%, will probably be considered 'unconscionable'. In the terminology of our model, the legislated policy that "anything goes" (which arises in light of the absence of an interest rate ceiling) will be deemed to be that of a 'bad legislator'. In considering certain levels of interest rates as 'unconscionable', courts will in practice establish the maximum acceptable interest rate. Suppose they do that at the rate of, say, 40%, which then becomes the effective cap. Now, contrast that with a scenario where Congress enacted a usury law at 50%. If (as we have assumed) originally the court's best judgment is that the appropriate interest rate cap is 40%, a legislated cap of 50% raises little disagreement. Hence the same court that would impose a 40% interest rate ceiling if legislation allowed any interest rate, would uphold the legislated 50% interest rate cap.

This usury law thus works as a permitting prohibition. In both cases, legislation permits the 45% contract (in the first case implicitly 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 celling changes how courts regulate transactions that are not expressly forbidden. This is how the enactment of a statutory prohibition can create a court permission.

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 look for legal interpretations that allow it to in effect rule against the legislator and apply their best judgment so as to place the threshold again at 40% (a related, real-world example can be found in *Marquette*, a 1978 Supreme Court decision).[3] But suppose the legislature replaces the 3% with a 35% interest cap, a generous legislative permission. Now the legislated

[3] See Marquette Nat'l Bank of Minneapolis v. First of Omaha Service Corp., 439 U.S. 299 (1978) (holding that the relatively low state interest caps could not be enforced on national banks that were based in other states).

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.

		Permitting prohibition	
Legislated ceiling	Prevailing ceiling	Legislated ceiling	Prevailing ceiling
None	40%	50% (down)	50% (up)

		Prohibiting permission	
Legislated ceiling	Prevailing ceiling	Legislated ceiling	Prevailing ceiling
3%	40%	35% (up)	35% (down)

Figure 1: Example of a permitting prohibition and a prohibiting permission

The second insight from the model is that the dispersion of court decisions may be greater with legislation that earns little deference from courts, than with legislation that earns 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 might be non-monotonic. Assuming that greater judicial dereference is a proxy for better legislation, the implication is that within a certain range, legislative improvement may trade-off with legal certainty. As before, this result requires a potentially large error from bad legislators.

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 find legal justifications to deny the practical effects intended by the legislation (the likelihood that the legislation is appropriate will be considered too low). Thus the ceiling will in effect 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. Whether through judicial review or more subtle interpretive processes, the legislator ends up overruled and a court-imposed interest rate cap arises as a byproduct of the court decisions. By allowing for disagreement between different courts, 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).[4] 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: Example of statutory improvement raising legal uncertainty

Generalizing, when legislation is completely within the zone of acceptance, no judge refrains from enforcing it so the variance of court decisions is "small". When the legislation is completely outside the zone of acceptance, every judge finds legal grounds to discard it and the variance is "large". And when the legislation is considered acceptable by few judges only, the variance might be even greater, "very large", since some but not all judges enforce it. 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 independent from other branches of government.

The rest of this article is divided as follows. The literature review comes next. Section 2 describes our model and demonstrates its implication for the enforcement of legislated prohibitions and dispersion of court decisions. Section 3 discusses examples of permitting prohibitions and prohibitting permissions from the real world. Section 4 concludes.

[4] 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).

1.1 Related Literature

The fact that courts exercise judgment and some level of discretion has been known for a long time. However, 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, authors started to embrace richer versions of judicial utility. Richard Posner, for example, 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 and Cover, 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.

Our approach is more closely related to Baker and Kornhauser (2022). They study

whether an appellate court wants to impose its judgment over a trial court that has more factual information, whereas we study whether courts want to impose their judgements over legislators. Both models are essentially about communication and explore the effects of differences in information across players. However, Baker and Kornhauser (2022) are concerned with disagreement over method (agents might give different weights to each piece of evidence), while here facts are known and the question is whether the legislation is appropriate. The model structure and take-home points are thus very different. Our approach also bears similarity to Baker and Malani (2015) but in their model, judges learn from judges on sister circuits whereas here judges learn from legislators.

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

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; Salama, 2012; Ramseyer and Rasmusen, 2013), 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.[5] 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 and impacts of institutional constraints on courts. This literature misses the fact that judges not only react to, but also learn from legislation, which is the aspect we wish to address.

[5] 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 Model

The model concerns court cases characterized by an object such as the interest rate in a credit contract, decibels of noise, alcohol consumption by a driver, or even things harder to quantify such as intensity of outrage in public speech, and so forth.

There exists a 'true' maximum admissible value of that object, denoted by $\omega \in \mathbb{R}$, drawn by nature. This may be an interest rate ceiling (to detect unconscionability), maximum permitted noise level (to detect a nuisance), maximum blood alcohol concentration (to detect driving under the influence), or even a test for offensive language (to detect intentional infliction of emotional distress), and so on.[6]

There are 3 agents in the model: a good legislator (indexed by G), a bad legislator (indexed by B) and an adjudicator (indexed by A). They all share the same utility function

$$u_i(x, \omega) = -(x - \omega)^2$$

for $i \in \{A, B, G\}$, where x is the maximum value of the variable effectively enforced by courts. Legislators and adjudicators share the same objective. They all want the effective threshold x to be as close as possible to the socially desirable threshold ω.

The sequence of events is as follows:

1. ω is drawn by nature. The legislator receives a signal about ω.
2. The legislator chooses the legislated cap, denoted by $\bar{x}$. The statute does not contain any information on the variance of the legislator's evaluation.
3. The adjudicator receives a signal about ω, observes $\bar{x}$, and chooses the effective cap, denoted by x.

Agents have different information about ω:

- Good legislator: he knows the socially optimal threshold ω. His signal $g = \omega$.
- Bad legislator: he gets a signal b, where $b \sim N(\omega, \sigma_B^2)$. The variance σ_B^2 is common knowledge, but he does not know ω. Knowing b and σ_B^2, he can infer a distribution for ω. A large σ_B^2 indicates large expected deviations from ω.
- Adjudicator: she gets a signal s, where $s \sim N(\omega, \sigma_s^2)$. The variance σ_s^2 is common knowledge, but she does not know ω. Knowing s and σ_s^2, she can infer a distribution of ω. A large σ_s^2 indicates that the signal s is not very informative about ω.

[6] In most practical cases, the set of admissible values for an object is bounded, but nothing changes in the model if ω represents the state of nature and the variable of interest (say, the interest rate ceiling) is a monotonic function of ω with bounded support (for example, logit or probit transformations of ω).

A legislator is good with probability π. The good and bad legislators in the model capture, in a simple way, the idea that adjudicators evaluate the legislation using their own information about the problem, trying to infer whether the legislation was guided by good and accurate information. In the model, this is represented by the adjudicator using her signal s and the legislation cap $\bar{x}$ to infer the type of the legislator.

All agents mazimize expected utility

$$E\left[u_i\left(x,\omega\right)\right] = -E\left[\left(x-\omega\right)^2 | I_i\right]$$

where I_i is the information set available to the player i.

2.1 The effective cap

The following proposition establishes how legislators and adjudicators behave in the equilibrium we are interested.[7]

Proposition 1 *There is a Perfect Bayesian Equilibrium where:*

1. *A good legislator chooses $\bar{x} = \omega$.*
2. *A bad legislator chooses $\bar{x} = b$.*
3. *Adjudicators follow an effective threshold x given by:*

$$x\left(s,\bar{x}\right) = p\bar{x} + \left(1-p\right)\frac{\bar{x}+Vs}{1+V} \tag{1}$$

where

$$p = \frac{1}{1+\frac{(1-\pi)}{\pi}\frac{1}{\sqrt{1+V}}\exp\left\{\frac{(s-\bar{x})^2}{2\sigma_s^2}\frac{V}{1+V}\right\}} \tag{2}$$

and

$$V = \frac{\sigma_B^2}{\sigma_s^2}$$

Proof. *See the appendix.* ■

The adjudicator selects x to maximize

$$E\left[u_A\left(x,\omega\right)\right] = -E\left[\left(x-\omega\right)^2 | s,\bar{x}\right]$$

[7] There are many uninteresting equilibria in this model. For example, suppose legislators always choose random numbers, unrelated to ω or b, and adjudicators always ignore the legislation. This is an equilibrium, nobody has incentives to deviate, but not an interesting equilibrium. Alternatively, suppose the good legislator always chooses $\bar{x} = \omega + \kappa$, where κ is a constant, and the bad legislator always chooses $\bar{x} = b + \kappa$. The adjudicator would always subtract κ from $\bar{x}$ and everything would work exactly as in Proposition 1, but legislators would be communicating in a rather strange language. Our analysis focuses on the equilibrium characterized in Proposition 1.

and given the choices of legislators, this leads to

$$E\left[u_A\left(x,\omega\right)\right] = -pE\left[\left(x-\omega\right)^2|s,g\right] - (1-p)E\left[\left(x-\omega\right)^2|s,b\right]$$

where p is the probability that the legislator is good given her two pieces of information, s and $\bar{x}$. The first term is minimized by $x = E\left[\omega|s,g\right] = g$: if the legislator is good, his signal reveals ω. The second term is minimized by $x = E\left[\omega|s,b\right] = (b+Vs)/(1+V)$: if the legislator is bad, a weighted average of $\bar{x}$ and s is the best choice. The weight on the private signal s is given by V, which is the ratio between σ_B^2 and σ_s^2. The ratio V is a measure of the expected amount of error in the legislation relative to the expected amount of noise in the adjudicator's information. If σ_s^2 is relatively large, then the statute is likely to be based on sound knowledge, hence the weight on the adjudicator's signal is small. This reasoning leads to (1).

Crucially, p is not an exogenous parameter: the adjudicator uses Bayes rule in order to calculate this probability, given by the expression in (2), derived in the appendix. The probability that the legislator is good reaches its maximum value at $s = \bar{x}$ and goes towards zero as s moves away from $\bar{x}$ (note that as $s-\bar{x}$ increases, the second term in the denominator grows exponentially). This happens because the difference between the signal of the court and the signal received by the bad legislator has variance $\sigma_B^2 + \sigma_s^2$; whereas the difference between the signal received by the court and the proposal enacted by the good lawmaker has variance σ_s^2.[8] Intuitively, the misinformed legislator adds an extra disturbance to $\bar{x}$. Hence, if s and $\bar{x}$ are close to each other, it is more likely that this extra disturbance was not added, i.e., it is more likely that the legislator is good.

Proposition 1 leads to our main result, summarized in Proposition 2.

Proposition 2 *If V is sufficiently small, x is always increasing in $\bar{x}$.*

However, if V is sufficiently large, x is not monotonically increasing in $\bar{x}$. For some values of $\bar{x}$, a stricter legislated cap (lower $\bar{x}$) leads to a more lenient effective cap (larger x). These are permitting prohibitions. In this case, there are also prohibitting permissions, as a more lenient legislated cap (larger $\bar{x}$) leads to a stricter effective cap (smaller x).

Proof. *See the appendix.* ■

In order to understand the effects of the legislated cap $\bar{x}$ on the effective cap x, suppose that $\bar{x}$ is larger than s (the reasoning for $\bar{x} < s$ is analogous). An increase in $\bar{x}$ has two effects: it increases the expected value of ω for a given probability that the legislator is good; but it raises the probability that the legislator is bad, and thus reduces the weight attributed to $\bar{x}$. Permitting prohibitions may occur if the second effect is strong enough.

[8] The variance of the difference between two normally-distributed variables equals to the sum of their variances; the variance of a variable is unaffected if a constant is subtracted.

When V is sufficiently small, there is relatively little potential for errors in the statute. Hence, from the adjudicator's point of view, a larger cap $\bar{x}$ is more likely to reflect a larger ω rather than a bad legislator. However, if V is large, as the cap $\bar{x}$ moves away from s, the adjudicator starts to attribute a larger probability of a bad legislator. This may lead to permitting prohibitions.

The numerical example in Figure 3 helps to illustrates the results. The signal s is set to zero, the variance σ_s^2 is normalized to 1 and $\pi = 1/2$. The horizontal axis shows legislated caps $\bar{x}$ from -4 to 4.[9] The dotted lines correspond to $x = 0$ (the legislation is completely ignored) and $x = \bar{x}$ (the adjudicator follows the legislation strictly). The different panels consider difference values of σ_B, thus reflecting different average errors (in absolute value). In this case, $V = \sigma_B^2$.

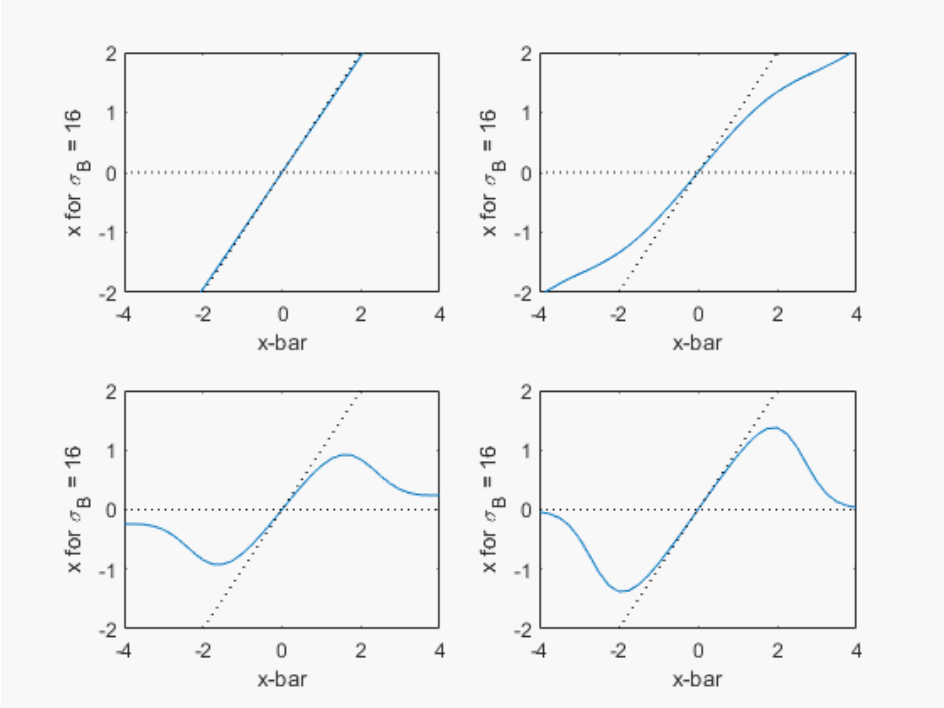

Figure 3: Effective threshold x as a function of the legislated threshold $\bar{x}$ in case $s = 0$, $\sigma_s = 1$ and $\pi = 1/2$ for different values of σ_B.

In the top left panel, σ_B is 0.25, so legislative errors are usually very small in comparison to σ_s. This captures a situation where either the adjudicator is not very well informed or the legislator is very well informed. For an adjudicator, a large distance between s and $\bar{x}$ is more likely to have occurred because s happened to be far from ω. A legislative mistake is an unlikely cause of the discrepancy. Since the adjudicator knows less than the legislator

[9] In case the legislator is good, this horizontal axis considers signals from -4 to 4 standard deviations from the mean, so a tiny minority (around 0.01%) of signals will be outside this range.

about ω, if $\bar{x}$ is far from what the adjudicator expected, it is more likely that her expected value of ω was far from the truth. The implication here is that x closely follows $\bar{x}$. The adjudicator defers to the legislation.

In the top right panel, σ_B is 1, which is equal to σ_s. Now, differences between s and $\bar{x}$ could be due to a bad legislator or to noise in the adjudicator's signal. The adjudicator is unsure. Hence the effective threshold x will be somewhere in between her signal ($s = 0$) and the legislated threshold $\bar{x}$. In the picture, for a given $\bar{x}$, the value of x will be between the horizontal and the inclined dotted lines. Still, x is always increasing in $\bar{x}$.

In the bottom left panel, σ_B is 4 times larger than σ_s. For low values of $\bar{x}$, x is close to $\bar{x}$. Intuitively, the bad legislator might be very far off, so an $\bar{x}$ coming from a bad legislator will usually be far from s. Therefore, an $\bar{x}$ close to s indicates that the legislator is probably good. Intuitively, if mistakes are potentially large and the legislation is in line with what the adjudicator would expect, the legislation has likely been enacted by a good legislator. Hence for $\bar{x}$ close to s, the adjudicator will attribute a high weight to the legislation. However, if $\bar{x}$ is, say, 3 standard deviations away from s, it is unlikely that the legislator is good. It is much more likely that $\bar{x}$ has been picked by a bad legislator. Hence x gets closer to s.

Permitting prohibitions occur in the regions of the graph where x is decreasing in $\bar{x}$. In the bottom left panel of the Figure, as $\bar{x}$ goes from 1.5 to 3, the probability that the legislator is good goes from reasonably large to quite small. In consequence, when $\bar{x} = 1.5$, the adjudicator attributes a relatively large weight to the legislation; but when $\bar{x} = 3$, the weight on the legislation is much smaller, so x is actually close to the adjudicator's signal, which is zero in the example.

Finally, the bottom left panel shows a case where σ_B is 16 times larger than σ_s. This captures a situation where the adjudicator is very well informed in comparison to the bad legislator. If the distance between $\bar{x}$ and s is between -1 and 1 standard deviation, the adjudicator is quite sure that the legislator is good. The legislated threshold $\bar{x}$ is around what she would expect, a bad legislator would likely choose a very different $\bar{x}$. Hence she ignores her own information and defers to the legislation. However, this changes when the distance between $\bar{x}$ and s gets closer to 2, as the suspicion that the legislator is bad starts to kick in. From then on, increases in $\bar{x}$ only reinforce this suspicion, leading to lower values of x. When the distance between the legislated cap and the signal is close to 4 standard deviations σ_s, the effective cap x is very close to s. In this case, the adjudicator is completely ignoring the legislation and using her signal only.

2.2 Discussion

Permitting prohibitions are likely to occur when the adjudicator has better information than the bad legislator but the good legislator has even better information. Intuitively, permitting prohibitions take place when the adjudicator has reasons to follow the legislation when it is deemed good, but reasons to ignore it when it is deemed bad.

For the sake of tractability, we have assumed that the good legislator is sure about ω and the bad legislator knows nothing besides b. In reality, bad legislators are likely to have more information about ω and good legislators might make mistakes as well. Still, as long as bad legislators act differently from good legislators, the main insights from this model should still apply to more complicated cases: changes in $\bar{x}$ would affect the probability of the legislator being good (from the point of view of an adjudicator), and this could open door to permitting prohibitions. Future research might explore the implications of more complicated information structures.

In our model, the legislator moves before the adjudicator and has no information about her preferences. This arguably fits well cases where future developments might shift opinions in unpredictable ways (so legislators cannot anticipate what adjudicators will think) and situations with dispersed preferences among judges such that the latter cannot infer legislators' strategic reasoning. But in other cases, legislators might have useful information about judges' preferences.

Here, we assumed that all agents share the same objectives, but one wonders what would happen in situations where legislators have incentives to game the legislation to raise the odds judges will apply it. While a thorough evaluation of this interaction is left for future research, we believe the key mechanisms emphasized here would still play a role. A legislator with preferences for a strict prohibition might enact a milder statute based on the understanding that a strict rule would likely be ignored.

In the model, no cost to ignore the legislation is imposed. Instead of assuming imperfect information, one could build a model on the premise that judges have ideal thresholds but face a fixed cost if they ignore the legislature. Importantly, permitting prohibitions would not naturally arise in this environment. Consider an adjudicator with an ideal interest rate cap of 50% a year. Say the cost of ignoring the legislation would make her willing to accept interest rate caps up to 80% – her effective cap. There is no reason to think that a change in the legislated cap from 80% to 100% would lead her to reduce her effective cap from 80% to, say, 70%. Her decision about a contract with interest rates of 75% should be the same in both cases, since neither her disutility from allowing this contract nor the cost from ignoring the legislation have been affected.

2.3 Rules and court predictability

In the absence of any legislation, an adjudicator would have no information other than her signal s. Hence the cap effectively imposed by the adjudicator x would be equal to s. In consequence, the standard deviation of x would be equal to the standard deviation of s, which is σ_s. Hence, with no legislation, the dispersion of decisions would mirror the dispersion in adjudicators' opinions.

In contrast, if a statute determining a cap $\bar{x}$ were followed by all adjudicators, we would have $x = \bar{x}$ always. The standard deviation of x would be zero. A clear rule that is always followed eliminates legal uncertainty regardless of whether it is a good or a bad rule. In the model, this is basically what happens when V is very small.

But what if V is large? How would a rule establishing a cap $\bar{x}$ affect the dispersion of effective thresholds x?

It is perhaps not surprising that if V is large, some dispersion in x would remain, as adjudicators would not simply follow the statute. However, it is actually possible that the existence of a statute might increase the standard deviation of x: certain rules might actually raise legal uncertainty. This section shows this by means of an example.

Consider an example with a large V, similar to the case plotted in the bottom right graph of Figure 3. The variances are $\sigma_s = 1$ and $\sigma_B = 16$, and $\pi = 1/2$. The ideal cap ω is normalized to 0. There is a continuum of adjudicators, each with a signal s_i, where $s_i \sim N(\omega, \sigma_s^2)$, as before. Conditional on ω, the signals are independent from each other. One adjudicator is randomly selected.

Each signal s_i implies a different probability p from (2) and hence a different effective cap x from (1). Using these expressions, we can compute numerically the probability distribution of x. Figure 4 shows the distribution of the effective cap x for three different values of the legislative cap $\bar{x}$.

The top chart in Figure 4 shows the case where $\bar{x} = \omega = 0$. The legislation is correct and adjudicators should follow it. The solid curve shows the equilibrium distribution of x while the dashed curve shows the distribution of s – which would be the distribution of x in the absence of legislation. Although strictly speaking adjudicators deviate from the legislation, the deviations are small. Around 93% of the adjudicators follow an effective cap x that is in the interval $[-0.5, 0.5]$. In the absence of legislation, less than 40% of them would follow a cap in this interval. In this case, a good statute is inducing better decisions and raising court predictability.

The bottom chart in Figure 4 shows the case where $\bar{x} = 16$. The legislation is very far from adjudicators' signals – which are normally distributed with mean zero and standard

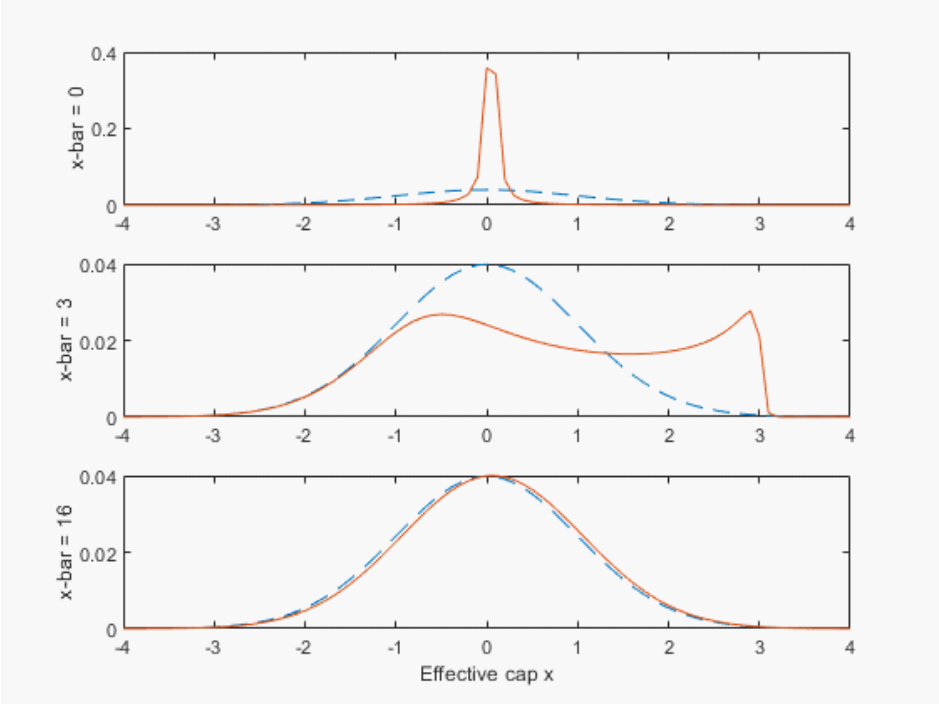

Figure 4: Distribution of the effective cap x for legislated caps $\bar{x} = 0$, $\bar{x} = 3$ and $\bar{x} = 16$ in case $\sigma_s = 1$, $\sigma_B = 16$ and $\pi = 1/2$.

deviation 1. The dashed curve shows the distribution of s – which would be the distribution of x in the absence of legislation. It is exactly the same as in the top graph – the scale of the y-axis is very different. The solid curve shows the equilibrium distribution of x. They are almost identical. Adjudicators are convinced the legislation is bad and are simply ignoring it. As a result, adjudicators behave almost as if there was no legislation.

Things are more interesting in the middle chart of Figure 4. The statute prescribes $\bar{x} = 3$, which is seen as too large by most adjudicators, but not too far off by several of them. Again, the dashed curve shows the distribution of signals and the solid curve shows the distribution of effective caps. Clearly, the latter exhibits a substantially larger dispersion. The existence of a rule is actually raising legal uncertainty. How can this happen?

When $\bar{x} = 3$, adjudicators with low signals (say, $s_i < -1$) will ignore the legislation; adjudicators with intermediate signals will be somewhat affected by the legislation; and adjudicators with high signals (say $s_i > 1$) will act according to a threshold x that is very close to 3. Since those who would choose a relatively low x are not affected and those who would choose a relatively high x choose an even larger one, the dispersion in x is larger than it would be in the absence of legislation.

Legislation deemed good by adjudicators leads to a reduction in the dispersion of effective caps, as shown in the top graph of Figure 4. Legislation that is simply ignored has no effect on the dispersion of caps, as shown in the bottom graph of Figure 4. The key insight behind the result in the middle graph of Figure 4 is that a somewhat extreme statute will be followed by some who would otherwise choose less extreme caps, but will be ignored by those on the other side of the distribution.

3 Examples

The key result of the model is a non-monotonic relation between legislated bounds and bounds effectively imposed by courts. We now illustrate how this result can in practice create permitting prohibitions.

Older life insurance policies in the United States habitually contained a "suicide exclusion" whereby coverage would be denied to the beneficiaries of a deceased person who voluntarily took her life.[10][11] 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).[12]

To invalidate the suicide exclusion, courts often employed a curious line of reasoning. Under the law, suicide is the intentional act of a person enjoying all her mental faculties. The problem is that those who commit suicide are in principle insane, and the acts of the insane are not valid. As such, insurance companies could only deny recovery if they could prove that the persons who took out their lives were sane in doing so.[13] 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.[14] 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 courts would usually still void the exclusion.[15]

[10] Most of the factual background on the history of life insurance discussed in this section can be found in Schuman (1993).

[11] See Knickerbocker Life Ins. Co. v. Peters, 42 Md. 414, at 417 (1875).

[12] 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).

[13] 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).

[14] 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).

[15] 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).

Due to understandable concerns with adverse selection and moral hazard, almost all 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).[16] 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.[17] 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).

In the language of the model, say $x = 0$ means that suicide exclusions are strictly forbidden and $x = 100$ means that any suicide exclusion in a contract is valid. The initial legislation can be thought of as, say, $\bar{x} = 90$, with very few constraints on insurance contracts regarding clauses on suicide. However, courts effectively impose a much lower cap, say $x = 10$, denying coverage only in very special cases. Legislation prohibiting the exclusion when the suicidal took her life two years or more after the policy was issued is a prohibition, as it lowers $\bar{x}$ to, say, 30. However, this ends up raising the effective cap from $x = 10$ to $x = 30$, so it works as a permission.

The non-monotonic relation between legislated and court-imposed bounds also generates the opposite phenomenon. Just like a statutory prohibition can cause courts to permit things that are not statutorily prohibited (such as a suicide exclusion in an insurance policy), the enactment of legislation permitting something may cause courts to prohibit related things not expressly permitted.

To illustrate, consider the legal battles in Canada over Quebec's legislation on commercial signs. In 1977, the Charter of the French Language defined French as the official language of the provincial government.[18] That lead to a long legal battle (Richez, 2014). In 1988, the Supreme Court of Canada ruled that the sections of the Charter prohibiting the use of languages other than French on commercial signs violated freedom of expression and were unconstitutional.[19] In response, the Charter was amended, first to permit English inside (Bill 178) and later outside (Bill 86) commercial establishments, and only insofar as French remained "markedly predominant". The new wording of the statute stands as good law.

On the face of it, the Charter amendments represent a permission: the original statutory

[16] In a few states the legislated exception covers only one year and in a few others there is no such legislation.

[17] 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).

[18] See Charter of the French Language, R.S.Q., ch. 11 (1977), art. 1 (also known as Bill 101).

[19] Ford v. Quebec (AG), [1988] 2 SCR 712.

policy was 'no English'; the new one was 'English acceptable if French predominates'. However, the fact that the Charter amendments were enacted in response to a Supreme Court decision that had struck down the original wording changes their actual significance. These permissions had the practical effect of creating a prohibition over something that originally had not been expressly permitted, that is, the use of English as the predominant language. The new statute is thus a prohibitting permission.[20]

Examples can also be found in more traditional, classic topics of private law. Consider for example the issue of the remedies available to a party who is aggrieved due to a contractual breach. In France, the Napoleonic Civil Code famously ascribed the remedy of damages, not of specific performance.[21] Early on, however, courts severely restricted the application of this rule only to obligations personal in character (painting of a portrait, for example).[22] Thus, and contrary to statutory wording, specific performance was effectively the preferred remedy and was upheld by courts whenever possible.

It took 212 years for this statutory rule to be changed. While explicitly recognizing the central place of specific performance as remedy for contractual breach, the 2016 amendment to the Civil Code also established that a court should not determine specific performance in case of "manifest disproportion between [the cost of specific performance] to the promisor and the benefit to the promisee". The dynamics created by the latter statutory change resembles a prohibiting permission, because a qualified permission (for courts to determine specific performance of an unfulfilled contractual obligation) ends up restricting courts ability to do so (because now courts specific performance is no longer available as a matter of right, and can be resisted on grounds of proportionality and reasonableness).

Thus, what we have is precisely the non-monotonic relation between legislated and court-imposed restrictions. As such, the statutory authorization for specific performance is likely to cause courts to enforce specific performance less – and not more – frequently.

In any case, the non-monotonic relation between legislated rules and rules effectively imposed by courts is not completely new in the empirical literature. Using data from criminal cases in the United Kingdom, Bindler and Hjalmarsson (2018) study the effects of the abolition of capital punishment in the 1800s on the behavior of juries. The abolition of capital punishment is a reduction in punishment severity, not a permission as in our paper, but there might be a connection between our theory and their results. Following a reasoning

[20] In the language of the model, $x = 0$ means that any use of English is strictly forbidden and $x = 100$ means there are no restrictions to use English. The initial legislation can be thought of as, say, $\bar{x} = 10$, English is mostly forbidden. But courts disagree and strike down the statute, effectively imposing $x = 90$, with almost no limitation to the use of English. Legislators then enact a permission to use English if French predominates, which we can think of $\bar{x} = 30$. When courts defer to legislation, they are in practice prohibiting the use of English in the interval that goes from $x = 30$ to $x = 90$.

[21] Art. 1142 of the 1804 Civil Code. See Rowan (2017) for details on the evolution of French remedies for breach of contract.

[22] See Szladits (1955).

similar to that in our model, legislation prescribing capital punishment to certain crimes could be deemed excessively tough by courts. If this is the case, a reduction in punishment severity could lead to an increase in the chances of conviction. This is exactly what they find.

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). This result 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, anchoring cannot explain the result found by Robbennolt and Studebaker (1999) that the passing of a legislated cap on punitive damages can increase the variance of court decisions. An explanation along the lines of Section 2.3 cannot be discarded.

4 Final remarks

We proposed a model of the choice concerning enforcement of a statute based on the signal emitted by the statute at hand. The results crucially depend on how well-informed courts are and how misguided legislation might be. This model raises several questions beyond those specifically discussed here. A theoretical one has to do with the dynamics of courts and legislatures concerning prohibitions. We showed that once courts are considered, the enactment of a prohibition 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.

Moreover, the idea that statutory prohibitions can generate permissions helps explain an old intuition, namely that much of the existing regulatory activity aims at enlarging rather than shrinking private markets. For instance, in standard economic models usury laws reduce the amount of loans in the economy, but these models do not take into account the court activism in curbing loans deemed as 'unconscionable'. The mechanism of permitting prohibition shows that well-chosen statutory interest rate caps may reduce the probability of successful lawsuits and lead to higher effective interest rate caps – and that might explain the endurance of numerous usury laws worldwide, including in developed countries. These and other applied questions are left for future research.

A Proofs

A.1 Proof of Proposition 1

Since this is a Perfect Bayesian Equilibrium, we need to prove that players maximize their expected payoffs given the strategies of others, and the adjudicator's beliefs are derived from the equilibrium strategies of the good and bad legislator via Bayes rule.

The problem of the adjudicator We solve the problem of the adjudicator assuming the good legislator chooses $\bar{x} = \omega$ and the bad legislator chooses $\bar{x} = b$ (we will later verify these claims).

In order to minimize her loss function, the adjudicator chooses $x = E(\omega|s, \bar{x})$, the expected value of ω considering all her information. Using Bayes rule, the adjudicator calculates the probability that the legislator is good given s and $\bar{x}$. For that, we need the probability density of signal s conditional on both types of legislators. In case the legislator is good, $\bar{x} = \omega$, hence the signal $s \sim N(\bar{x}, \sigma_s^2)$, so the probability density of s is given by

$$\phi\left(s - \bar{x}; 0, \sigma_s^2\right)$$

where $\phi(a; \mu, \sigma)$ denotes the probability density of a normally distributed variable with mean μ and standard deviation σ evaluated at a. In case the legislator is bad, since $\bar{x} = b$, $\bar{x} - \omega \sim N(0, \sigma_B^2)$. Using $s \sim N(\omega, \sigma_s^2)$, we get that $s \sim N(\bar{x}, \sigma_s^2 + \sigma_B^2)$. Hence the probability density of s conditional on the legislator being bad is

$$\phi\left(s - \bar{x}; 0, \sigma_s^2 + \sigma_B^2\right)$$

Hence, the probability the adjudicator is good is given by

$$\begin{aligned} p &= \frac{\pi\phi\left(s - \bar{x}; 0, \sigma_s^2\right)}{\pi\phi\left(s - \bar{x}; 0, \sigma_s^2\right) + (1-\pi)\phi\left(s - \bar{x}; 0, \sigma_s^2 + \sigma_B^2\right)} \\ &= \frac{1}{1 + \frac{(1-\pi)}{\pi}\frac{\phi\left(s-\bar{x};0,\sigma_s^2+\sigma_B^2\right)}{\phi(s-\bar{x};0,\sigma_s^2)}} \end{aligned}$$

Using the expression for the probability density of the normal distribution, we get the expression for p in (2).

The adjudicator then calculates the expected value of ω. In case the legislator is good, $\omega = \bar{x}$. In case the legislator is bad, simple Bayes rules for normal distributions imply a conditional expected value of ω given by

$$\frac{\sigma_s^2\bar{x} + \sigma_B^2 s}{\sigma_s^2 + \sigma_B^2} = \frac{\bar{x} + Vs}{1 + V}$$

Minimization of the adjudicator's loss function leads to $x = E(\omega|s, \bar{x})$, which yields the expression in (1).

The problem of the legislators In order to prove that the good legislator chooses $\bar{x} = \omega$ and the bad legislator chooses $\bar{x} = b$, we start by noting some features of p and x that play an important role in the proof.

Lemma 3 *Let $u = s - \bar{x}$. For any $\bar{x}$, if adjudicators follow the strategy described in Proposition 1, then:*

1. *p is an even function of u:*
$$p(u) = p(-u)$$
2. *$\frac{\partial p}{\partial \bar{x}}$ is an odd function of u:*
$$\frac{\partial p}{\partial \bar{x}}(u) = -\frac{\partial p}{\partial \bar{x}}(-u)$$
3. *Let $v = x - \bar{x}$. Then v is an odd function of u:*
$$v(u) = -v(-u)$$
and $v(0) = 0$.
4. *$\frac{\partial x}{\partial \bar{x}}$ is an even function of u:*
$$\frac{\partial x}{\partial \bar{x}}(u) = \frac{\partial x}{\partial \bar{x}}(-u)$$

Proof. *Inspection of (2) shows that p is a function of $(s - \bar{x})^2$ only, which proves the first statement.*

For the second statement, note that

$$\frac{\partial p}{\partial \bar{x}} = p^2 \frac{(1-\pi)}{\pi} \frac{1}{\sqrt{1+V}} \exp\left\{\frac{u^2}{2\sigma_s^2}\frac{V}{1+V}\right\} \frac{V}{1+V}\frac{u}{\sigma_s^2}$$

which leads to the second statement.

For the third statement, from (1), we get to

$$v = x - \bar{x} = (1-p)\frac{V}{1+V}u$$

and since p is an even function of u, v is an odd function of u. The expression also shows that $v(u) = 0$.

Last,

$$\frac{\partial x}{\partial \bar{x}} = 1 - (1-p)\frac{V}{1+V} - \frac{V}{1+V}u\frac{\partial p}{\partial \bar{x}}$$

The first term is an even function of u (since V is a constant and p is an even function). The second term is the product of u and an odd function of u, hence it is also an even function of u. This yields the fourth claim.[23] ■

Now we solve the problem of the good legislator assuming the adjudicator follows the threshold in (1).

The good legistator chooses $\bar{x}$ to minimize $E\left[(x-\omega)^2|\omega\right]$, hence the first order condition yields

$$E\left[(x-\omega)\frac{\partial x}{\partial \bar{x}}|\omega\right]=0$$

We need to prove this holds if the legislator chooses $\bar{x}=\omega$. The term of the first order condition that must be zero can then be written as

$$\int_{-\infty}^{\infty}(x-\bar{x})\frac{\partial x}{\partial \bar{x}}\phi\left(s-\bar{x};0,\sigma_s^2\right)ds$$

and using the definitions $v=x-\bar{x}$ and $u=s-\bar{x}$ from Lemma 3, we get to

$$\int_{-\infty}^{\infty}v\frac{\partial x}{\partial \bar{x}}\phi(u)du$$

Lemma 3 shows that $\partial x/\partial \bar{x}$ is an even function of u, and since $\bar{x}=\omega$, $\phi(u)$ is an even function as well. Since v is an odd function of u, we get that $v\frac{\partial x}{\partial \bar{x}}f(u)$ is an odd function of u and the above integral must be zero indeed.

The proof for the bad legislator is similar. Assuming the adjudicator follows the threshold in (1), the bad legistator chooses $\bar{x}$ to minimize $E\left[(x-\omega)^2|b\right]$, hence the first order condition yields

$$E\left[(x-\omega)\frac{\partial x}{\partial \bar{x}}|b\right]=0$$

We need to prove this holds if the legislator chooses $\bar{x}=b$. Write $\varepsilon_B=\omega-b$ and $\varepsilon_s=\omega-s$. Then ε_B and ε_s are normally-distributed variables with mean zero and variances σ_B^2 and σ_s^2, respectively. Writing

$$s=\omega-\varepsilon_s=b+\varepsilon_B-\varepsilon_s$$

we see that s is normally distributed with mean b and variance $\sigma_B^2+\sigma_s^2$. We can thus write the term of the first order condition that must be zero as

$$\int_{-\infty}^{\infty}(x-\bar{x})\frac{\partial x}{\partial \bar{x}}\phi\left(s-\bar{x};0,\sigma_s^2+\sigma_B^2\right)ds$$

[23] Formally, define

$$w(u)=u\frac{\partial p}{\partial \bar{x}}(u)$$

Then

$$w(-u)=-u\frac{\partial p}{\partial \bar{x}}(-u)=-u\left(-\frac{\partial p}{\partial \bar{x}}(u)\right)=u\frac{\partial p}{\partial \bar{x}}(u)=w(u)$$

and then, an argument similar to the one for the good legislator implies this integral is equal to zero $\bar{x} = b$. It is thus optimal for the bad legislator given the equilibrium choices of the other players.

A.2 Proof of Proposition 2

The derivative of p with respect to $\bar{x}$ can also be written as

$$\frac{\partial p}{\partial \bar{x}} = -p(1-p)\frac{V}{1+V}\frac{(\bar{x}-s)}{\sigma_s^2}$$

We can write x as

$$x = \frac{\bar{x}+Vs}{1+V} + p\frac{V}{1+V}(\bar{x}-s)$$

hence

$$\frac{\partial x}{\partial \bar{x}} = \frac{1}{1+V}\left[1 + pV\left(1-(1-p)\frac{V}{1+V}\frac{(\bar{x}-s)^2}{\sigma_s^2}\right)\right] \tag{3}$$

It is easy to see that

$$\lim_{V\to 0}\frac{\partial x}{\partial \bar{x}} = 1$$

Since this derivative is continuous in V, we get the first claim: for sufficiently small V, the derivative of x with respect to $\bar{x}$ is always positive.

For the second claim, let's write $p(\bar{x}-s)$ as the probability the legislator is good from (2). Note that

$$\begin{aligned}\lim_{V\to\infty} p(0) &= 1\\ \lim_{\bar{x}-s\to\infty} p(\bar{x}-s) &= 0\end{aligned}$$

In words, when V is large, $p(0)$ is close to 1 and as $(\bar{x}-s)$ goes towards infinity, $p(\bar{x}-s)$ goes to zero. Hence for large values of V, there will exist some $\bar{x}-s=\Delta$ such that $p(\Delta)=1/2$. Using (2) and manipulating yields

$$\Delta = \sqrt{\frac{1+V}{V}2\sigma_s^2\left[\log\left(\frac{\pi}{1-\pi}\right)+\log\left(\sqrt{1+V}\right)\right]}$$

Using the expression in (3), we get that for large V, for $\bar{x}-s=\Delta$ such that $p(\Delta)=1/2$,

$$\frac{\partial x}{\partial \bar{x}} = \frac{1}{1+V}\left[1+\frac{V}{2}\left(1-\left[\log\left(\frac{\pi}{1-\pi}\right)+\log\left(\sqrt{1+V}\right)\right]\right)\right]$$

Taking the limit yields

$$\lim_{V\to\infty}\frac{\partial x}{\partial \bar{x}} = -\infty$$

Using continuity, for large values of V, $\partial x/\partial\bar{x}$ is negative when $p=1/2$, hence x is not monotonically increasing in $\bar{x}$.

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