

Coordination and Innovation in Judiciaries: Correct Law vs. Consistent Law

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Abstract

We identify the coordination consideration among judges who do not have formal authority over each other, and investigate its consequences for their decisions and legal innovations. Coordination concerns arise because judges value the consistent application of law. To mitigate their strategic uncertainty, judges overweight interpretations that are visible throughout the judiciary (e.g., prominent judges' opinions) because their visibility facilitates coordination. This creates a tradeoff between the consistent and correct application of law—the two desiderata of judicial decisionmaking. In particular, anticipating overreactions to their opinions, some prominent judges refrain from expressing their informed opinions. Paradoxically, the propensity to refrain is strongest in prominent judges who care most about the correct application of law. From their perspective, excessive concern for uniformity in judiciary overrides the informational value of expressing informed opinions. We provide concrete examples from contract, property, and tort law that support our theoretical mechanisms.

Keywords: Non-hierarchical judiciary, judicial decision making, legal innovation, coordination, public information, McPherson, Escola, Javins.

1 Introduction

As judges create and apply law, two considerations weigh heavily: (1) correctness: the law should yield good results, in the sense of fairness, efficiency, and conformity to legal norms, and (2) consistency: the law should be applied uniformly, so throughout the judiciary judges dispose of similar cases similarly.¹ Often times, the correctness and consistency criteria go hand in hand, for example, when all agree on what constitutes the best doctrine and all know that others will apply it too. But sometimes the correctness of prevailing doctrine becomes uncertain, for instance in the face of rapid social change. Then, some judges may begin to see other doctrinal possibilities as superior. In turn, uncertainty about correctness generates strategic uncertainty about consistency because judges cannot be sure which doctrine other judges will find correct. Judges then face difficult decisions. In this paper, we explore the consequences of these twin uncertainties for the decisions of judges as well as the spread of legal innovations among judges who do not have formal authority over each other. Because the bulk of American judges operate in such settings (e.g., in different state jurisdictions) the analysis has wide applicability in the United States; it also applies to other countries that combine common law jurisprudence with federalism (e.g., Canada and Australia).

How do common law judges decide when faced with uncertainty about the correct law? According to Judge Benjamin Cardozo, a judge “must get his knowledge just as the legislator gets it, from experience and study and reflection; in brief, from life itself” (1921, 113). That is, judges use their experience and legal skills to apply laws correctly. But because their knowledge and experiences differ, so do their assessments of the correct law. These differences might undermine the consistent application of law. Thus, when rendering decisions, judges may modify their own assessments to make their judgments closer to what they expect other judges will do.² They want to target the correct law, but they also want to target the same law.

Because judges care about legal consistency, their decisions involve a strategic element of estimating what others will do. We argue that a key consequence of this strategic environment is that judges overreact to public information about the correct interpretation of the law—e.g.,

¹Judges care about both considerations, and each consideration has had its advocates in different times. For example, a concern for correctness is reflected in Justice Holmes’s famous declaration that the law should reflect “the felt necessities of the times” (Holmes 1881, 1), and consistency is reflected in Justice Brandeis’s statement that “in most matters it is more important that the applicable rule of law be settled than that it be settled right” (*Burnet v. Coronado Oil & Gas Co.*, 285 U.S. 393, 406 (Brandeis, J., dissenting) (1932)).

²Talley (1999) examines (and dismisses) the possibility of information cascades among non-hierarchically arrayed judges even when they hear cases sequentially.

the opinion of a prominent judge (like Benjamin Cardozo of the New York Court of Appeals) who is very visible in the judiciary. Judges overreact in the sense that they put more weight on public information than they would if they only cared about evaluating what the correct law should be, and not also about getting their decisions close to each other to increase consistency in the judiciary. They put more weight on public information because it allows them to coordinate better. The reason is that public information is common knowledge: Everyone observes it, and everyone knows that everyone observes it, and so on. Thus, to bring their decisions closer together, judges downplay their private information, which others cannot see and hence cannot use to predict a judge's decision, and emphasize their public information instead. In a sense, because visible opinions about the law function as a focal point, judges put more weight on them than is merited by the information they communicate about the correct law, thereby partially sacrificing correctness to consistency.

The overreaction of judges to public information has important consequences for the spread of legal innovations. Some judges, by virtue of their skillful reasoning and their positions, are more visible than others. They are leaders in one field of the law or another, not because they have formal authority to overrule or reverse other judges, but because their opinions are informative, persuasive, and visible. As a *Washington Post* editorial said of Learned Hand, the preeminent judge of the Second Circuit Court of Appeals during the early and mid twentieth century, "He has won recognition as a judges' judge. His opinions command respect wherever our law extends, not because of his standing in the judicial hierarchy, but because of the clarity of thought and the cogency of reasoning that shape them" (quoted in Gunther 1994, 574). Leader judges' opinions, books, and law review articles become public information among judges facing similar cases. Judges see these leaders' views of the correct law and, critically, know that other judges see those views as well. That is, the views of leader judges become common knowledge among judges who face similar decisions. But as we discussed above, because judges care about legal consistency, they overweight all public information, including leader judges' opinions. As a result, leader judges who care more about the correct application of the law may counterintuitively refrain from expressing opinions which contain valuable information for finding the correct law. They would rather wait to make their views more accurate so that the gains from additional information outweigh the overreaction to public information.

An example of such restraint can be seen in a bankruptcy decision by Judge Henry Friendly of the Second Circuit, who was considered "the greatest judge of his era" (Dorsen 2012).

Friendly acknowledged that in making a narrow decision the court was “not giving bankruptcy judges the guidance which they doubtlessly desire and it is our duty to provide if we properly can.” “But,” he continued, “it is better to fail in this respect than to attempt to give guidance without having seen the variety of factual situations, having heard from the adversarial presentations, and having the benefit of the scholarly community which time will undoubtedly afford.” *In re B.D. Int’l Disc. Corp.*, 701 F.2d 1071, 1077 (2d Cir. 1983). Friendly was building on other judges’ similar reluctance to issue noisy opinions, quoting Justice Harlan that such opinions “suffer the danger of pitfalls that usually go with judging in a vacuum ... they are apt in their application to carry unintended consequences which once accomplished are not always easy to repair.” *Id.* (quoting *Sanders v. United States*, 373 U.S. 1, 32 (1963) (Harlan, J., dissenting)). We identify one such “unintended consequence”: the overreaction of other judges, who are not bound by the decision, to the public information produced by the decision, stemming from the desire for legal consistency.

The literature that studies the interactions among judges in different courts focuses primarily on judicial hierarchy, studying a variety of topics including strategic auditing (Cameron, Segal, and Songer 2000), breaking with precedent (Bueno de Mesquita and Stephenson 2002), whistle-blowing (Beim, Hirsch, and Kastellec 2014), and doctrinal compliance (Westerland et al. 2010).³ However, the vast majority of judges do not have authority over each other, and in this sense are placed horizontally in the pyramid of judicial authority. Our focus is on the interaction among these judges. Our key insight is to identify the coordination consideration and its consequences for decisionmaking among the multitude of judges who do not have formal authority over each other. We make use of the advances in the literature on coordination with incomplete information to capture the nature and consequences of these interactions. In particular, our formalization adapts the framework of Morris and Shin’s (2002) seminal paper, “The Social Value of Public Information,” which has been applied widely in finance. This paper is the first to adapt their insights to the study of judiciaries.

We next discuss examples from contract, property, and tort law to demonstrate uncertainty and legal innovations. Then, we present a stylized model to formalize the logic and intuitions.

³More broadly, there is a vast literature on various aspects of the judiciary, including the evolution of precedent (Baker and Mezzetti 2012), judicial review (Fox and Stephenson 2011), opinion obfuscation (Staton and Vanberg 2008), and decisionmaking in collegial courts (Kornhauser 1992).

2 Examples

Before we proceed to the model, we provide three examples to illustrate the horizontal spread of legal innovations. All three innovations reviewed below were successful and widely emulated, so there is a temptation in hindsight to view them as obvious. At the time, however, the correct choice of law as a matter of policy and interpretation was uncertain,⁴ and the opinions reviewed below contributed greatly to judicial coordination in the face of uncertainty.

Example 1: *McPherson v. Buick Motor Co.* Does a lawsuit arising from injuries sustained by defectively manufactured products belong in (or, as the lawyers says, “sound in”) contracts or torts? If the action sounds in contracts, then liability can attach only to a person with whom the injured party has a contract (the “privity of contract” requirement); but if it sounds in torts, then no privity of contract is required, and the manufacturer of a defective product may be liable to anyone who uses the product in a reasonable way. Thus, when deciding cases regarding injuries from defective products, judges must choose a location on a spectrum with contract requirements toward one end and tort requirements toward the other. The traditional view had been closer to the former. The contract-tort distinction assumed special importance in the early twentieth century with the rise of mass-produced goods. In a landmark opinion, Judge Benjamin Cardozo of the New York Court of Appeals rejected the old common law notion that the duty of guarding against the dangers attendant to manufactured products “grows out of contract and nothing else,” and “put the source of the obligation” in tort law (*McPherson v. Buick Motor Co.*, 217 N.Y. 382, 390 (1916)). The manufacturer of a negligently made product is thus liable to one who is injured by it, “irrespective of contract” (*id.* at 389-90). In the context of the case, this new interpretation allowed a person who was injured while driving a Buick car to sue the Buick Motor Company itself, rather than being limited to suing the dealer from whom he had bought the car (and with whom he was in privity of contract).

The New York Court of Appeals was the leading state court during Cardozo’s tenure, with several prominent judges on its bench (Posner 1990). Moreover, Cardozo was involved in founding the American Law Institute, and his innovations appeared in the Institute’s restatements

⁴For example, although Justice Traynor in *Escola* made powerful arguments in favor of strict liability based on information allocation and risk reduction, on the other side was the powerful consideration that the notion of liability without fault is both alien to standard tort law and seemingly contrary to basic fairness. Similarly, although Judge Skelly Wright in *Javins* explained how the property-centered view of leases had worked great abuses upon the urban poor, on the other side was the consideration that allowing tenants to raise defenses based on the condition of premises would prolong legal proceedings and inhibit landlords from evicting nonpaying tenants, thereby disrupting the rental market and raising prices.

of tort law. A judge who was interested in advances in tort law would thus naturally turn to the New York Court of Appeals for guidance. Indeed, Graham's (2015) study shows that Cardozo's opinion in *McPherson* had a significant impact on tort law as it was adopted by judges throughout the country.

Example 2: Escola v. Coca Cola Bottling Co. When should a manufacturer be held liable for an injury caused by its products? What should be the test of liability and who should carry the burden of proof? Toward one end of the spectrum, negligence is required for fault, and the burden of proving negligence is on the injured party. Toward the other end of the spectrum, the manufacturer is strictly liable: negligence is irrelevant, and the manufacturer must pay for injuries from the reasonable use of its products. In a concurring opinion on a 1944 case, *Escola v. Coca Cola Bottling Co.*, Roger Traynor of the California Supreme Court argued that "a manufacturer of goods [should] be responsible for their quality regardless of negligence" (24 Cal. 2d 453, 463). Traynor justified his stance on the grounds that the manufacturer is in the best position to know about the dangers inherent in its products and how to reduce such dangers. "As handicrafts have been replaced by mass production," wrote Traynor, an ordinary customer has lost the ability to "investigate for himself the soundness of a product" (467). "Manufacturing processes, frequently valuable secrets, are ordinarily either inaccessible to or beyond the ken of the general public" (467). Therefore, fixing the responsibility for injury solely on the manufacturer "will most effectively reduce the hazards to life and health inherent in defective products that reach the market" (462). The majority had relied on a doctrine in tort law (*res ipsa loquitur*) that placed a *presumption* of liability on the manufacturer. But Traynor argued that such doctrines were insufficient because the manufacturer could rebut the presumption by introducing evidence that it took proper care in manufacturing the product, and "An injured person ... is not ordinarily in a position to refute such evidence or identify the cause of the defect, for he can hardly be familiar with the manufacturing process as the manufacturer himself is" (463).

Traynor made his arguments for strict liability again in 1949, 1958, and 1960. By the 1960s, California had become the leading state supreme court (Dear and Jessen 2007; Friedman et al. 1981), and Traynor was a prominent and visible judge, soon to become chief justice of the California Supreme Court. Finally, in the 1963 landmark case, *Greenman v. Yuba Power Products*, the court as a whole adopted strict liability. Soon thereafter, the American Law Institute's *Restatement (Second) of Torts* (1965) adopted Traynor's arguments in *Escola*. Graham's (2015) data show that after Traynor's innovation was adopted in California, it spread rapidly to other

states. According to Bird and Smythe (2012, 568), it has now been adopted in almost all states.

Example 3: *Javins v. First National Realty Corp.* Can a tenant be evicted for not paying rent even if the nonpayment is due to the landlord’s failure to make the rented premises habitable? Is the lease of a residential unit the conveyance of an interest in land, subject to the peculiar requirements of real property law, or is it a contract that should be construed like any other contract? In the pure property interpretation, the landlord has little obligation beyond physically delivering the unit to the tenant; he need not make the unit habitable, and his failure to provide such essentials of daily life as heat and sanitation does not excuse the tenant’s failure to pay rent. E.g., *Hoy v. Holt*, 91 Pa. 88 (1879). In a middle-ground interpretation, located somewhere between property and contract law, the landlord does have a duty to make the premises habitable, but the tenant cannot raise the landlord’s breach of this duty as a defense in an action for eviction for nonpayment of rent; rather, he must bring a separate suit against the landlord to vindicate his right to a habitable unit. E.g., *Posnanski v. Hood*, 46 Wis. 2d 172 (1970). In a more contract-centered view, not only does the landlord have an obligation to make the premises habitable, but “the tenant’s obligation to pay rent is dependent upon the landlord’s performance of his obligations,” so the court in an action for eviction must consider whether the tenant’s nonpayment of rent was justified by the failure of the landlord’s duties. E.g., *Javins v. First National Realty Corp.*, 428 F.2d 1071 (D.C. Cir. 1970). Early American caselaw advocated a property-centered interpretation, under the assumption that what matters is the land itself, not the condition of the dwelling constructed on the land (see generally 1 American Law of Property § 3.78). That assumption might have been reasonable for an agrarian society, but in time it became disconnected from a reality in which apartments were leased primarily as places to live in, not as structures on land to be tilled. In response, courts toward the middle of the Twentieth Century came to place greater obligations on landlords and to conceptualize a residential lease less as a conveyance of an interest in land than an ordinary contract.

The best-known landmark in this conceptual transformation is Judge James Skelly Wright’s opinion in *Javins*. The opinion elucidated the reasons for the move from property to contract, explaining how the principles “derived from feudal property law” had become inapposite for “the modern apartment dweller,” who seeks in an apartment a “well known package of goods and services—a package which includes not merely walls and ceilings, but also adequate heat, light and ventilation, serviceable plumbing facilities, secure windows and doors, proper sanitation, and proper maintenance” (*Javins*, 428 F.2d at 1074). The lease of an apartment is thus

like a contract for a standard manufactured good and “should be interpreted and construed like any other contract” (1075). Just like contracts for goods are subject to implied warranties of fitness and merchantability, leases should be subject to an implied warranty that the premises are habitable (1075-77). Moreover, promises in contracts are mutually dependent, such that one party’s failure to carry out her promise excuses the other party from performance. “Under contract principles,” then, “the tenant’s obligation to pay rent is dependent upon the landlords performance of his obligations, including his warranty to maintain the premises in habitable condition” (1082).

Judge Skelly Wright’s opinion in *Javins* had no binding authority beyond the D.C. Circuit, but it was immensely influential in the nationwide transformation of landlord-tenant law. It was one of the first decisions to recognize the implied warranty of habitability, and apparently the first to allow it as a defense in a landlord’s eviction action (Chused 2004, 193). State courts around the country soon adopted both holdings, often citing *Javins* as persuasive, though not binding, precedent (see, e.g., Chused 2004; Rabin 1984). Today *Javins* is viewed as a pioneering decision, and it is often excerpted in property law casebooks.

3 Model and Analysis

There are two judges indexed by $i \in \{1, 2\}$. Judge i must take an action $a_i \in \mathbb{R}$. He aims to make his action close to the state of the world $\theta \in \mathbb{R}$ (reflecting a concern for correct law), and to the other judge’s action a_j (consistency). In particular, judge i ’s payoff, u_i , from taking action a_i is:

$$u_i(a_i, a_j, \theta) = -(1 - r) (a_i - \theta)^2 - r (a_i - a_j)^2, \quad i \neq j, \quad r \in (0, 1). \quad (1)$$

The state of the world θ is unknown to judges and they have a common (improper) prior that it is distributed uniformly on \mathbb{R} . In the *McPherson* case, for example, θ captures the correct law regarding the liability issues of injuries sustained by defectively manufactured products, where lower θ corresponds to more elements of liability-in-contract and higher θ corresponds to more elements of liability-in-tort. Judge i observes a noisy private signal about the state of the world, $x_i = \theta + \epsilon_i$, where $\epsilon_i \sim N(0, \sigma_\epsilon^2)$ and ϵ_i s are distributed independently of each other and θ . In addition to their private signals, the judges observe a public signal $y = \theta + \eta$, where $\eta \sim N(0, \sigma_\eta^2)$, and η is distributed independently of θ and ϵ_i s. Given their signals, judges simultaneously choose their actions—so that they do not observe each other’s actions before they

make their decisions. The parameter r indexes how much the judges value legal consistency as compared to correctness.

Strategies and Equilibrium. A judge i 's strategy is a mapping from his information set $I_i = (x_i, y)$ to an action a_i , and the equilibrium concept is Bayesian equilibrium.

Analysis. We focus on the natural class of symmetric linear strategies

$$a_i(I_i) = kx_i + (1 - k)y, \quad k \in [0, 1], \quad (2)$$

so that higher signals x_i or y both indicate a higher value of θ , raising the judge's action, albeit possibly with different weights. To characterize the equilibrium in these linear strategies one must show that there exists a weight k that makes the corresponding strategies best responses to each other. Following the steps of Morris and Shin (2002), we show in the Appendix that such an equilibrium exists and it is unique. In fact, they show that focusing on linear strategies is without loss of generality.

Proposition 1 (Morris and Shin 2002) *There is a unique equilibrium in which a judge i with private signal x_i and a public signal y chooses an action*

$$a_i(I_i) = \frac{ay + b(1 - r)x_i}{a + b(1 - r)}, \quad (3)$$

where $a = 1/\sigma_\eta^2$ is the precision of the public signal and $b = 1/\sigma_\epsilon^2$ is the precision of private signals.

Proposition 1 reveals the judges' coordination incentives. If judges did not have any concern for coordination (i.e., judicial coherence or the rule of law), then $r = 0$, and $a_i(I_i) = E[\theta|x_i, y] = \frac{ay + bx_i}{a + b}$, reflecting the judges' pure consideration for legal correctness—using all their information to estimate the location of θ . But as judges value judicial coherence more (i.e., as r rises), each judge pays less attention to his private assessment of the case, which is unknown to the other judges, and puts more weight on what is common knowledge throughout the judiciary—in order to reach conclusions and take actions that are closer to other judges.

Leader Judges. This framework allows us to study some aspects of the spread of legal innovations and judicial leadership at the horizontal dimensions of the judiciary where judges do not have formal authority over each other. The leadership of a judge then corresponds to other judges' voluntary adaptation of his legal opinions; and a key aspect of the spread of legal innovations is whether and when such a leader judge tends to announce his opinions and

reasoning. To study these questions, we extend the model by positing that, in addition to regular judges discussed above, there is a prominent judge with three characteristics: (1) he is able to obtain more accurate information about the correct law (θ), at a cost, (2) his obtained information is publicly observed by other judges in the judiciary, and (3) he cares about the judiciary as a whole. We call this prominent judge the *leader judge*. Whether his information is disseminated through his written opinion on a case, a law review article, or a book, the leader judge's main concerns are about the effect of this information on the judiciary as a whole.⁵

In the modified game, first, the leader judge chooses a , the precision of the public signal y .⁶ Then, regular judges observe the public signal y and their private signals x_i , and simultaneously decide which action to take. The equilibrium concept is perfect Bayesian equilibrium. Let R be the leader judge's weight on consistency (rule of law), and $C(a)$ be the costs of obtaining the (public) signal y with precision a , with $C(0) = 0$, and $C'(a), C''(a) > 0$. The leader judge's payoff U_L , from obtaining the (public) signal y with precision a is $U_L(a_1, a_2, \theta, a) = u_L(a_1, a_2, \theta) - C(a)$, with

$$u_L(a_1, a_2, \theta) = -(1 - R) [(a_1 - \theta)^2 + (a_2 - \theta)^2] - R [(a_1 - a_2)^2 + (a_2 - a_1)^2], \quad (4)$$

where we recognize that the equilibrium actions of other judges, a_1 and a_2 , are influenced by the precision of the leader judge's public signal.

To understand the key strategic forces, we first consider the extreme cases of $R = 0$ and $R = 1$. When $R = 1$, the leader judge only cares about consistent application of the law throughout the judiciary: he simply wants all the judges make the same decision ($a_1 = a_2$), whatever that decision may be. But the judges also care about the correct (interpretation of the) law—they want their decisions to be close to θ . Critically, it is the judges' private information that causes their actions to diverge. If the judges did not have any private information, a public signal y would lead them to perfectly coordinate on action $a_i = E[\theta|y]$. Of course, the judges do have private information, but the more accurate is the public signal, the less weight the judges will put on their private information, leading to closer actions and more consistency. Thus, absent any direct cost of obtaining a precise public signal, a marginal increase in the precision

⁵That is, even when the leader judge decides a case, the value of making the correct judgment in that one case is negligible to him relative to the effect of the information on the actions of many judges in the judiciary. To simplify the exposition, our model considers only two regular judges in the judiciary, but the qualitative results extend routinely to $N > 2$ judges with $u_i = -(1 - r) (a_i - \theta)^2 - r \frac{\sum_{j \neq i} (a_i - a_j)^2}{N-1}$.

⁶One can interpret $a = 0$ as the leader judge not taking a case, not writing an article or book, or writing an opinion that provides little guidance for others, as in our example with Judge Friendly.

of the public signal is always desirable for a leader judge who only cares about consistency.

Next, consider the case of $R = 0$, in which the leader judge only cares about the correct interpretation of the law. From his perspective, the judges should use all their information to take their actions as close to the expectation of θ as possible. That is, he would have a judge i choose $a_i = E[\theta|y, x_i] = \frac{ay+bx_i}{a+b}$. For example, with a completely uninformative public signal ($a = 0$), he would have judge i choose $a_i = x_i$. But as Proposition 1 shows, the equilibrium actions of a judge i is $a_i(y, x_i) = \frac{ay+b(1-r)x_i}{a+b(1-r)}$: Because the judges also care about coordinating, they underweigh their private information, putting too much emphasis (from the perspective of a pure concern for correct law) on public information. Thus, from the leader judge's perspective, more precise public information is a double-edged sword: It is beneficial because more information allows judges to have a more accurate estimate of the law, but it can also be harmful because judges overreact to public information. As a result, from the leader judge's perspective, a somewhat informative public signal can be less desirable than a completely uninformative public signal (or no public signal) with $a = 0$, because in the latter case the judges would not underweigh their private signals and would choose $a_i = x_i$.

To extend these intuitions and make them more precise, we must investigate the effect of higher public signal precision on the leader judge's expected payoff by tracing its influence on the equilibrium behavior of other judges. One can calculate the leader judge's marginal benefit of raising the public signal's precision in the absence of precision-improvement costs (see the proof of Proposition 2 below):

$$\frac{\partial E[u_L]}{\partial a} = \frac{(1-R)b}{[a+(1-r)b]^3} \left(\frac{a}{b} - f(r, R) \right), \quad (5)$$

where $f(R, r) \equiv -\frac{1-r}{1-R} [1 - 2r + (3 - 2r)R]$.

When the information advantage of the leader judge relative to other judges is high enough (i.e., when a/b is larger than $f(r, R)$), the leader judge always benefits from revealing marginally more precise information to other judges. How high is high enough? That depends on the weights, R and r , that the leader judge and other judges put on legal consistency and correctness, as these weights determine the threshold $f(r, R)$. When $f(r, R) < 0$, even when the leader judge's information is very imprecise ($a \approx 0$), he still benefits from revealing more precise information. However, when $f(r, R) > 0$ this is not true anymore, and $f(r, R) > 0$ if and only if $R < R^*(r) \equiv \frac{2r-1}{3-2r}$. Proposition 2 summarizes these results.

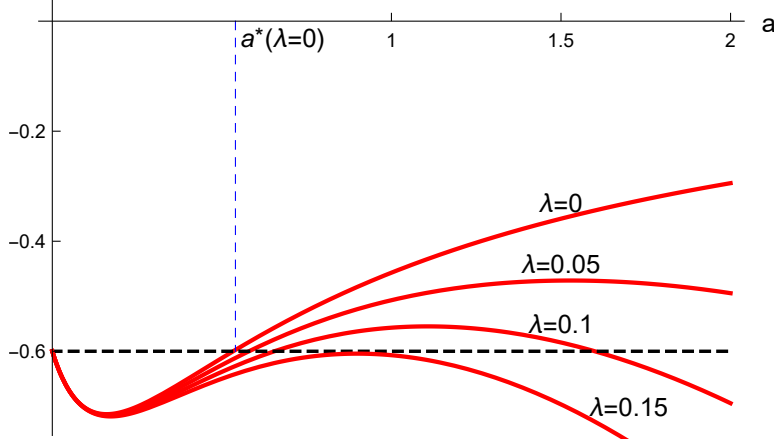


Figure 1: The leader judge’s expected payoff as a function of the precision, a , of his public signal. Different curves illustrate different costs of obtaining more precise signals: $C(a) = \lambda a^2$. Even absent any direct costs of acquiring more precise information, there is a threshold $a^*(\lambda = 0)$ such that the leader judge prefers not to disseminate an informative public signal ($a = 0$) rather than to disseminate a moderately informative public signal $a \in (0, a^*(\lambda = 0))$. Equation (6) specifies this threshold. Moreover, when $\lambda > \lambda^* \approx 0.15$, the cost of acquiring more precise information is sufficiently high that the leader judge does not acquire any informative public signal to disseminate.

Proposition 2 *Even absent information acquisition costs, revealing marginally more precise information harms the leader judge if and only if the relative precision of his information is sufficiently low. Formally,*

$$\frac{\partial E[u_L]}{\partial a} < 0 \Leftrightarrow \frac{a}{b} < f(R, r).$$

A necessary condition is that the leader judge care sufficiently more about correctness than about consistency. Formally, there is an increasing function $R^(r)$ such that, for a given r , $f(r, R) > 0$ if and only if $R < R^*(r)$.*

Proposition 2 reveals that even absent any direct costs, the leader judge would not disseminate marginally more precise (public) information whenever (1) he cares about the judiciary’s best interpretation of the law sufficiently more than he cares about its consistency ($R < R^*(r)$),⁷ and (2) he believes that his information will not be sufficiently precise relative to the information of other judges ($a/b < f(R, r)$)—even though his information may be more precise than theirs. Then, the leader judge would not like the judges to observe an informative public signal unless it is sufficiently informative. As Figure 1 illustrates, the leader judge prefers a completely

⁷That $R^*(r)$ is increasing reflects that as judges care more about consistency (as r increases), they overweight the public signal more, raising the costs (due to overreaction) of revealing public information.

uninformative public signal (with $a = 0$) to any moderately informative signal with $a \in (0, a^*)$. The threshold a^* is the unique non-zero solution to $E[u_L(a)] = E[u_L(0)]$, which exists whenever $f(r, R) > 0$:

$$a^* = \frac{1 - R}{1 + R} \frac{f(r, R)}{1 - r} b. \quad (6)$$

Moreover, suppose $C(a) = \lambda c(a)$ with $\lambda > 0$, and $c(0) = c'(0) = 0$ and $c'(a), c''(a) > 0$ for $a > 0$. Parameter λ captures the “primeness” or “readiness” of the informational environment, with a high λ indicating that good information is costly to produce and a low λ indicating that it is cheap. For example, a case presenting an issue never thought of before might have a high λ whereas a case presenting an issue on which there has been much caselaw and scholarly commentary might have a low λ . (Alternatively, λ can be interpreted as capturing the competence of the leader judge, with lower λ indicating higher competence.) Focusing on the case with $f(r, R) > 0$, there exists a λ^* such that the leader judge chooses a positive a if and only if $\lambda > \lambda^*$. Figure 1 illustrates.

In sum, two broad conclusions emerge. When the leader judge cares about the correct application of law sufficiently more than the consistent application of law (i.e., $R < R^*(r)$ so that $f(r, R) > 0$), a leader judge does not reveal information (send a public signal) unless (1) the signal is sufficiently precise (i.e., we will not observe $a < a^*$); *and* (2) the informational environment is sufficiently prime (i.e., $\lambda > \lambda^*$). This is not to say that less precise public signals are not valuable to the judiciary (in the first case), or that information revelation in less prime environments (with $\lambda < \lambda^*$) cannot be valuable to the judiciary (in the second case); rather, *from the leader judge’s perspective*, the overreaction of the judiciary to his opinion outweighs the value of making informative statements. In failing to speak, leader judges deprive the judiciary of their guidance. But from the perspective of leader judges like Friendly, who put significant weight on the correctness of laws, “It is better to fail in this respect than to attempt to give guidance without having seen the variety of factual situations, having heard from the adversarial presentations, and having the benefit of the scholarly community which time will undoubtedly afford.”

4 Conclusion

Formal analysis of judiciaries has focused primarily on judges’ interactions along the vertical dimension of the judicial hierarchy, where some judges have legal authority over others (Kastellec 2017). This paper explores the interactions between the vast majority of judges, who have

no authority relationship with one another, such as judges in distinct jurisdictions. Despite the absence of formal authority, such judges interact because they face a fundamental tension present in all common law judicial systems: the desire to employ law well-suited to “the felt necessities of the times” on the one hand and the desire to maintain consistency in adjudication on the other. We studied the strategic considerations that arise from these concerns and investigated their consequences for the horizontal spread of legal innovations. In particular, we showed that a desire for coordination leads judges to overweight publicly visible legal interpretations, including those enunciated by judges in a position of (informal) leadership. Knowing this, a leader judge who is concerned about the correct interpretation of law might refrain from communication, even when he has valuable information to communicate, because regular judges would place more weight on his opinion than its informational content merits. The greater the regular judges’ concern for consistency, the greater the risk of overreliance, and therefore the larger the pool of leader judges who refrain from innovation. Our coordination approach to judiciaries is broadly applicable to judiciaries that combine common law jurisprudence with federalism, such as the United States, Canada, and Australia.

Several directions for future research stand out. One could combine the interactions of judges along both horizontal and vertical dimensions of authority, for example, among judges on different U.S. district or circuit courts of appeal. Another direction is to incorporate judicial interactions on a network. Network structure may facilitate or hinder the spread of information depending on the location of judges relative to each other (Caldeira 1985 and Bird and Smythe 2012 offer suggestive empirical findings). A third direction would endogenize the emergence of leader judges. A small literature in legal studies examines notable judges, describing their thinking (Ursin 2009), careers (Dorsen 2012), the extent of their influence (Landes, Lessig and Solimine 1998), and judicial rhetoric (Rabin and Sugarman 2003). In repeated interactions among judges, some can build professional reputation due to their skills as well as their location in the network, and obtain prominence and visibility. These directions, which can be explored theoretically and empirically, are left to the future.

5 References

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6 Appendix: Proofs

Proof of Proposition 1: From equation (1), player i 's expected payoff given his information $I_i = (x_i, y)$ is:

$$E[u_i(a_1, a_2, \theta)|I_i] = -(1-r) (a_i^2 - 2a_i E[\theta|I_i] + E[\theta^2|I_i]) - r (a_i^2 - 2a_i E[a_j|I_i] + E[a_j^2|I_i]).$$

Player i chooses his action a_i to maximize this expected payoff. The first order condition is:

$$\frac{\partial E[u_i(a_1, a_2, \theta)|I_i]}{\partial a_i} = -(1-r) 2(a_i - E[\theta|I_i]) - r 2(a_i - E[a_j|I_i]) = 0,$$

so that player i 's best response is:

$$a_i(I_i) = (1-r) E[\theta|I_i] + r E[a_j|I_i]. \quad (7)$$

Recall that $a = \frac{1}{\sigma_\eta^2}$ is the precision of public signal and $b = \frac{1}{\sigma_\varepsilon^2}$ is the precision of private signals. Then, from the properties of Normal distribution,

$$E[\theta|I_i] = E[x_j|x_i, y] = \frac{ay + bx_i}{a+b}, \text{ for } j \neq i. \quad (8)$$

Moreover, given the linear strategy of judge j , $a_j(I_j) = kx_j + (1-k)y$,

$$E[a_j|I_i] = E[kx_j + (1-k)y|x_i, y] = k E[x_j|x_i, y] + (1-k) y = k \frac{ay + bx_i}{a+b} + (1-k)y. \quad (9)$$

Substituting from (8) and (9) into (7) and collecting the coefficients of x_i and y yields:

$$a_i(I_i) = \frac{b(rk+1-r)}{a+b} x_i + \left(1 - \frac{b(rk+1-r)}{a+b}\right) y. \quad (10)$$

By comparing the coefficients of x_i and y from equations (2) and (10), we can solve for k :

$$k = \frac{b(rk+1-r)}{a+b}, \text{ and hence } k = \frac{b(1-r)}{a+b(1-r)}.$$

Substituting for this equilibrium value of k into $a_i(I_i)$ in equation (2) and simplifying yields:

$$a_i(I_i) = \frac{ay+b(1-r)x_i}{a+b(1-r)}. \quad \square$$

Proof of Proposition 2: To ease calculations, it helps to write u_L in terms of θ and the noise in public and private signals. From equation (3), recall that, given a public signal y and his private signal x_i , judge i 's equilibrium strategy is $a_i(I_i) = \frac{ay+b(1-r)x_i}{a+b(1-r)}$. Substituting for $y = \theta + \eta$

and $x_i = \theta + \epsilon_i$ into this equilibrium strategy yields $a_i(y, x_i) = \theta + \frac{a\eta + b(1-r)\epsilon_i}{a+b(1-r)}$. Substituting from this into (4) yields:

$$\begin{aligned} u_L(a_1, a_2, \theta) &= -(1-R) \left[\left(\frac{a\eta + b(1-r)\epsilon_1}{a+b(1-r)} \right)^2 + \left(\frac{a\eta + b(1-r)\epsilon_2}{a+b(1-r)} \right)^2 \right] \\ &\quad - 2R \left(\frac{a\eta + b(1-r)\epsilon_1}{a+b(1-r)} - \frac{a\eta + b(1-r)\epsilon_2}{a+b(1-r)} \right)^2. \end{aligned}$$

Because η and ϵ_i s are independent, we have $E[\eta\epsilon_i] = E[\epsilon_1\epsilon_2] = 0$, and hence:

$$\begin{aligned} \frac{E[u_L]}{2} &= -(1-R) \frac{a^2 E[\eta^2] + b^2(1-r)^2 E[\epsilon_i^2]}{[a+b(1-r)]^2} - R \frac{2b^2(1-r)^2 E[\epsilon_i^2]}{[a+b(1-r)]^2} \\ &= -(1-R) \frac{a+b(1-r)^2}{[a+b(1-r)]^2} - R \frac{2b(1-r)^2}{[a+b(1-r)]^2}, \end{aligned} \quad (11)$$

where the second equality follows by recognizing that $E[\eta^2] = \frac{1}{a}$ and $E[\epsilon_i^2] = \frac{1}{b}$. Equation (11) allows us to study the effect of increases in the precision of the leader judge's public signal on the judiciary as a whole and hence on the leader judge's expected payoff. Differentiating $E[u_L]$ with respect to a and simplifying the result yields:

$$\frac{1}{2} \frac{\partial E[u_L]}{\partial a} = \frac{1-R}{[a+(1-r)b]^3} [a - f(r, R) b],$$

where $f(R, r) \equiv -\frac{(1-r)[1-2r+(3-2r)R]}{1-R}$. Thus, if $[1-2r+(3-2r)R] \geq 0$, then $\frac{dE[u_L]}{da} > 0$. In this case, absent the costs of acquiring more precise information, the leader judge would always like to obtain more precise information. In contrast, if $[1-2r+(3-2r)R] < 0$, then $f(r, R) > 0$, and the leader judge would like more precise public information if and only if $a > f(r, R) b$. Finally, observe that $[1-2r+(3-2r)R] < 0$ if and only if $R < R^*(r) \equiv \frac{2r-1}{3-2r}$. \square