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Theorizing the U.S. Supreme Court

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Summary and Keywords

We summarize the formal theoretical literature on Supreme Court decision-making. We focus on two core questions: What does the Supreme Court of the United States do, *and how can one model those actions*; and, what do the justices of the Supreme Court want, and *how can one model those preferences*? Given the current state of play in judicial studies, these questions then direct this survey mostly to so-called separation of powers (SOP) models, and to studies of a multi-member ("collegial") court employing the Supreme Court's very distinctive and highly unusual voting rule.

The survey makes four main points. First, it sets out a new taxonomy that unifies much of the literature by linking judicial actions, modeling conventions, and the treatment of the status quo. In addition, the taxonomy identifies some models that employ inconsistent assumptions about Supreme Court actions and consequences. Second, the discussion of judicial preferences clarifies the links between judicial actions and judicial preferences. It highlights the relationships between preferences over dispositions, preferences over rules, and preferences over social outcomes. And, it explicates the difference between consequential and expressive preferences. Third, the survey delineates the separate strands of SOP models. It suggests new possibilities for this seemingly well-explored line of inquiry. Fourth, the discussion of voting emphasizes the peculiar characteristics of the Supreme Court's voting rule. The survey maps the movement from early models that ignored the special features of this rule, to more recent ones that embrace its features and explore the resulting (and unusual) incentive effects.

Keywords: U.S. Supreme Court, collegial courts, multi-member courts, appellate decision-making, case space, separation of powers, non-median judge, judicial preferences

Introduction

This essay surveys the theoretical literature on the U.S. Supreme Court.

Several considerations render this task difficult. First, much of the theory that has been developed is, in fact, a theory of U.S.-style appellate courts generally and not a theory of the Supreme Court of the United States most particularly. A survey of all aspects of appellate courts is too bulky a task in the few pages allotted. Second, though judicial politics and behavior have been areas of intensive empirical research for over 70 years, the modern approach to institutional analysis—which we would characterize as in-depth understanding of institutional rules and actor motivations, combined with rational choice analysis and formal game theoretic modeling—was surprisingly slow to arrive.[1] To a degree, this slow arrival reflected the commitment of the dominant school of judicial studies, attitudinalism, to psychology and social psychology. This commitment largely precluded efforts to theorize institutions in the same way that proved so productive in the study of legislatures, electoral systems, and (to a lesser degree) executives and bureaucracy. Progress has been swift of late, but fundamental conceptual issues—for example, what do courts really do, and what do judges really want?—remain surprisingly unsettled.

To resolve the first problem, we present a very selective review of possible topics. For example, we ignore the rich theoretical literature on the judicial hierarchy; interested readers are urged to consult Kastellec (2016) which offers a sophisticated review. We further ignore the politics of Supreme Court nominations, though this area has stimulated a small formal literature (Anderson, Cottrell, & Shipan, 2015; Cameron & Kastellec, FORTHCOMING, and provide recent entries). We say very little about litigants, or how to scale judicial votes, or many other interesting topics.

Instead, we focus on two core questions: What does the Supreme Court of the United States do, *and how can one model those actions*; and, what do the justices of the Supreme Court want, and *how can one model those preferences*? Given the current state of play in judicial studies, these questions then direct this survey mostly to so-called separation of powers (SOP) models, and to studies of a multi-member ("collegial") court employing the Supreme Court's very distinctive and highly unusual voting rule.

To resolve the second problem, we concentrate on formal models of courts, which began to appear about 1990. So, we neglect vast literatures in Political Science, Law, and Economic Analysis of Law that offer keen insights on what the Supreme Court does and what the justices want, but stop short of crystalizing those insights into formal models. No doubt this is our loss! But again, compression requires focus.

In short, this survey highlights the development of formal frameworks that capture the peculiarly judicial features of courts, especially those of the U.S. Supreme Court.

What Does the Supreme Court Do and How Can One Model Those Actions?

The U.S. Supreme Court is a distinctive court, but nonetheless and above all *it is a court*. This fact means that, like almost all courts, the Supreme Court resolves disputes. To do so, it "applies the law" to the "facts."

This bare description requires considerable unpacking. First, the Court is, in a certain sense, passive. Before the Court can act, a litigant, disappointed in the outcome in the intermediate courts of appeal or a state high court, must ask the Court to review the decision below.[2] Then, because the Supreme Court has an almost entirely discretionary docket, it chooses freely from among the appealed decisions. Second, the selected litigants present a *case*; that is, a concrete, fact-ridden dispute between two (or perhaps more) parties. Third, the Court must resolve this concrete dispute: It determines which party prevails. Dispute resolution is not optional; it is obligatory in every instance.[3] So, the Court cannot hold "don't know" or "it's a tie." It is this *disposition* of the case that "resolves" the dispute and thus is a necessary feature of adjudication. Fourth, the Court must resolve the dispute by applying law in the form of a *rule* to the facts in the case. Finally, a high appellate court like the Supreme Court may go beyond the simple disposition of the case and make "policy" of a kind. We shortly return to exactly what kind of policy it makes.

Modeling the actions of the Supreme Court requires, minimally, a mathematical vocabulary that instantiates the concepts of *cases*, *facts*, *rules*, and *dispositions*. Beginning in the early and mid-1990s, judicial theorists developed this vocabulary. It is increasingly used to model courts of all kinds both theoretically and empirically (see Kornhauser, 1992A, 1992B; Lax, 2011 provides a thoughtful overview).

Cases, Dispositions, and Rules

We introduce some simple notation that allows a unified presentation of judicial action and preferences.

To begin, consider a set X of cases. A particular case is $x \in X$. A disposition of a case assigns to the case a value $d(x)$ in an outcome or disposition space $O = \{0, 1\}$. We may interpret $d(x) = 0$ as a disposition in favor of defendant ("not liable") and a disposition $d(x) = 1$ as a disposition in favor of plaintiff ("liable").

A *legal rule* is a function that maps cases into dispositions, that is, $r : X \rightarrow O$.[4] In words, a legal rule indicates the disposition to be associated with any case.

This formulation is very abstract. Most analyses adopt a more geometrical (and restricted) characterization. Typically, analysts assume a one-dimensional case space, say the unit interval. So $X = [0, 1]$.[5] They then restrict the set of legal rules to a set of cut-point rules. A rule with cut-point y has the form:

$$r(x; y) = \begin{cases} 1 \text{if } x < y \\ 0 \text{if } x \geq y \end{cases} (1)$$

A universally familiar example is a speed limit. Here, a case is the speed of a car; the legal rule is a cut-point rule in which a driver is not speeding if the speed of the car is below the speed limit, while the driver is speeding if the speed of the car is above the speed limit.[6]

Let R_X be the space of cut-point rules over the case space X. Notice that R_X is a set of *functions* from X into O. Analysts, however, typically index these functions by the value of the cut-point y; this practice, though handy, can lead to a confusion of the case space X (e.g., possible speeds of the car) and the space of rules or policies R_X (e.g., possible speed limit rules).

The Supreme Court considers a case (a particular x characterized by facts), applies a legal rule to the case (employs a particular $r(x; y)$), and thus generates a disposition of the case (a $d(x)$ indicating the prevailing litigant). In this sense, the Supreme Court is like all other Anglo-American courts and most civil law courts.[7]

Supreme Court Policy-Making: Rules, Vetoes, and Block-Vetoes

But, the Supreme Court is unlike other courts in the U.S. judicial hierarchy in that its primary business is not disposing of cases—though it must always do that—but rather creating policies. What are these policies and how can they be modeled?

Broadly speaking, the Supreme engages in policy-making in three distinct modes: (1) statutory interpretation; (2) administrative law, particularly the review of agency rule-making; and (3) constitutional review, particularly of federal statutes, state statutes, and executive actions. The Court's policy-making actions in these venues are somewhat distinct from each other and need to be modeled in somewhat different ways.[8]

Table 1 provides information about Supreme Court decision-making in each decisional mode, further distinguishing between review of administrative rules on procedural grounds and their review on substantive grounds. The second column indicates typical

players in game theoretic models of the decisional mode. For example, models of substantive review of agency rules typically include players such as the House, the Senate, the President, an Agency and the Court. On the other hand, models of bargaining on the Court itself focus on the nine justices themselves. The third column in Table 1 indicates the nature of the Supreme Court decision, for example, a disposition plus the creation of a new rule or a disposition and the veto of a proposed rule. The fourth column indicates the modeling convention associated with the judicial action employing the notation just introduced. Finally, the fifth column indicates the role of the status quo ante in each mode, a somewhat vexed question.

Table 1. Supreme Court Actions in Four Decisional Modes.

Decisional Mode	**Typical Actors**	**Judicial Action**	**Modeling Convention**	**Role of Status Quo**
1. Statutory Interpretation	H,S,P, J; or, J^1–J^9	Disposition + Rule	$d(x)$, y^J	None once J moves, because no other player has a veto over y^J
2a. Administrative Law —Procedural Review of Rules	A,J	Disposition (effectively a judicial veto)	$d(x)$	Judicial veto of the rule reestablishes the rule prior to y^A
2b. Administrative Law —Substantive Review of Rules	A, J; or, H, S, P, A, J	Disposition + Block-Veto (prohibited class of rules)	$d(x)$, $\check{y}^J$ (floor) or $\hat{y}^J$ (ceiling)	Judicial veto reestablishes the rule prior to y^A but blocks some rules
3. Constitutional Review of Statutes or Executive Action	J, C; or J, L; or J, P	Disposition + Block-Veto (prohibited class of rules)	$d(x)$, $\check{y}^J$ or $\hat{y}^J$	Judicial veto reestablishes the rule prior to y^C, y^L, or y^P but blocks some rules

Notation: H = House of Representatives, S = Senate, P = President, A = Agency, C=Congress, J = Supreme Court, L = state or local government, J^i =Justice i. $d(x)$ =disposition of case x, y^J = judicially created cut-point, $\tilde{y}^J$ = floor on allowable cut-points, $\hat{y}^J$ =ceiling on allowable cut-points.

Statutory Interpretation and Judicial Rule-Making. Here is a definition of statutory interpretation that captures current modeling practice: A court engages in statutory interpretation when it alters or modifies a policy or rule created by a legislature. This is a very broad definition, which covers mild forms such as disambiguation of unclear statutory language, all the way to deliberate substitution by the Court of a new rule for the statutorily mandated one.

In models of statutory interpretation, such as Ferejohn and Weingast (1992), Schwartz et al. (1994), or Iaryczower et al. (2002), the Court creates a policy. In the formalism introduced above, the Court creates its own cut-point y^J for use in Equation (1), which it then applies to the instant case to derive $d(x)$. Presumably the Court will use this rule to dispose of future cases, unless Congress overrules the Court's rule by enacting a new statute. A subtlety, indicated in the last column of Table 1, is that Congress has no mechanism simply to veto the Court's rule $r(x; y^J)$ and thereby reestablish the original statutory rule $r(x; y^C)$. Rather, Congress must enact a new statute articulating a new rule $r(x; y^{C'})$; the original statutory rule $r(x; y^C)$ is thus irrelevant once the Court acts. The Court's rule becomes the effective status quo, much as the president's unilateral action becomes the effective status quo in models of unilateral executive action (Howell, 2003; Moe & Howell, 1999).

Administrative Rule-Making, Rule Vetoes, and Block-Vetoes. The Supreme Court reviews rules promulgated by administrative agencies. There are a variety of grounds on which it may do so. However, it is useful to distinguish *procedural review* from *substantive review*. The former determines whether the administrative agency properly followed the procedures specified in the Administrative Procedures Act. The latter typically hinges on whether the agency's interpretation of a statute was proper, that is, whether the agency actually had legislative authority to formulate the rule that it issued.[9] For example, does the Environmental Protection Agency have the authority under the Clean Air Act to regulate carbon emissions from power plants?

In terms of the notation introduced above, procedural review is straightforward. The case space X can be viewed as "extent of procedural regularity in rule-making," the Agency's rule is a point in this space, and the cut-point y in Equation (1) indicates an obligatory level of procedural regularity. If the Agency's rule-making failed to meet or exceed the obligatory level of procedural regularity, the rule fails on procedural grounds. Thus the disposition $d(x) = 0$ denotes a decision in favor of complainant and *effectively vetoes the instant rule*, while the disposition $d(x) = 1$ denotes a decision in favor of the agency and effectively accepts the instant rule, at least on procedural grounds. Arguably, there is no substantive policy-making by the Court at all, but simply enforcement of the Administrative Procedures Act.[10] A judicial veto of the instant regulation restores the

status quo prior to the issuance of the Agency's regulation. A nearly equivalent formalization would have the Agency propose a policy, and the Court veto or accept the policy (see, for instance, Ferejohn & Shipan, 1990; or Gely & Spiller, 1990, discussed below).

Substantive review is a more complex matter. The Agency establishes a rule $r(x; y^A)$ that it intends to use to regulate the conduct of some entities, for example, firms, individuals, or state or local governments. (The conduct of these entities becomes the cases x feeding into the Agency's rule.) The Agency justifies its rule via an interpretation of a statute, such as the Clean Air Act or the Food and Drug Act. When the Court reviews the rule on substantive grounds, it may review the Agency's interpretation of the statute, not just the agency's rule-in-hand.[11] Rejecting the Agency's statutory interpretation naturally rejects the Agency's rule-in-hand—but it often implicitly or explicitly rejects many other possible rules as well. And conversely, accepting the Agency's statutory interpretation accepts the Agency's rule-in-hand but may implicitly accept a variety of other possible rules as well.

Using the formal notation, the action by the Court imposes restrictions on the set of possible Agency rules, the set R_x. This restriction may be quite complex. But in the simplified setting of one-dimensional cut-point rules like Equation (1), the Court's actions often take the form of a floor on allowable cut-points $\tilde{y}^J$, or a ceiling on allowable cut-points $\bar{y}^J$. In either case, the Court vetoes not a single proposed rule but a block of possible rules; hence its action is a *block-veto*.[12] If the Court strikes down the Agency's rule using a block-veto then, just as in a rule-veto, its action reestablishes the status quo ante. Of course, Congress can legislatively reverse the Court's block-veto, by giving the Agency new statutory authority or by asserting that the Agency's understanding of its prior authority was correct.

Constitutional Review and Block-Vetoes. Supreme Court review of statutes or executive action on constitutional grounds strongly resembles substantive review of Agency rules, with the obvious difference that Congress cannot legislatively reverse the Court's ruling.[13]

Must We Really Distinguish Dispositions from Policies?

Scholars trained in legislative studies or voting theory often feel some mental strain upon encountering models that take judicial activities seriously. After all, when modeling congressional voting or voting in referenda, one need only represent policies; there are no case dispositions. Thus legislative or electoral scholars frequently ask, if I am just interested in policy, do I really need to bother with case dispositions?

The answer is a resounding, “It depends.” More specifically, *it depends on whether dispositions interact with policy-making*. If they do not, then dispositions may be ignored, at least conceptually. For example, we suggested above that in the review of an administrative regulation on procedural grounds, the distinction between the case disposition (government prevails vs. challenger prevails) and the policy action (a veto of the regulation) is slight. On the other hand, if dispositions and policy-making do interact, then a formal model restricted to policy is apt to be misleading. An example discussed below concerns contemporary models of intra-court bargaining. In some of these models, case dispositions and policy-making interact profoundly—members of the Court in the minority dispositional coalition do not participate in the bargaining over the policy content of the majority opinion. If so, one cannot get very far in understanding policy without incorporating dispositions. One might also imagine models of statutory interpretation in which the Court modifies a legislative rule only when confronted with particular cases, since often the Court could dispose of the case as it wishes without modifying Congress’s rule. Finally, most empirical studies rely on data about judicial case dispositions (which are abundant), not data about judicial policies (which are difficult to devise). If the empirical work is to be grounded in theory, the theory needs to incorporate the entity actually employed in the empirics.

What Do Justices Want and How Can One Model Their Preferences?

“What do judges want?,” is one of the most vexed questions in the study of courts. Nonetheless, every formal model of Supreme Court behavior must answer the question and do so explicitly. A variety of answers have been offered, which we review.

What Goes in a Judicial Utility Function?

The following point is fundamental: *The judicial utility function must connect to judicial actions*, such as those indicated in Table 1. Otherwise, the posited utility function is useless for modeling the choices justices make. So, if one is interested in the justices’ choices about policy, the utility function must incorporate policies, in some fashion. If one is interested in the justices’ choices about case dispositions, the utility function must incorporate or link to dispositions. And if one is interested in both, perhaps because they interact, the utility function must address both.

As a practical matter, analysts have attributed one other domain of preference to judges aside from policy and dispositions: self-interest (Ash & MacLeod, 2014; Epstein et al., 2013; Posner, 1993). Models in this vein assume judges face an effort-cost of decision, or a subjective cost of reversal. At present these models do not seamlessly integrate policy preferences or dispositional preferences with effort-costs though there is no fundamental barrier to doing so (see, e.g., Spiller & Vanberg, 2003).

Consequential vs. Expressive Preferences

Preferences over dispositions and policies may be in either of two modes. The preferences may be *expressive*. Or they might be *consequential*. When a justice has an expressive preference, she cares about *her* decision; when she has a consequential preference, she cares about the decision *of the Court* (or of another body like Congress). Thus, when a justice has expressive preferences over dispositions, she suffers a loss (or incurs a gain) when she endorses the incorrect (correct) disposition. When a justice has a consequential preference over dispositions, she suffers a loss (or incurs a gain) when the final disposition of the Court differs from (agrees with) the disposition she thinks correct.

Distinguishing between these two modes is important because consequential preferences easily lead to models with strategic (insincere) voting or other actions. For example, the Chief Justice may vote the "wrong" way on a case disposition in order to assign the case to the most favorable member of the dispositional majority coalition. Or, the Court may modify its most-preferred policy from statutory interpretation (y^J in Table 1) in order to preclude Congress from establishing a worse policy legislatively. Conversely, assuming expressive preferences often precludes strategic behavior of this kind.

Formalizing Judicial Utility

Return to Equation (1). This definition of a legal rule identifies a formal connection between dispositions ($d(x)$) and policies (y). From this formal connection, we may also derive a substantive connection between preferences over dispositions and preferences over policies.

Consider the policy space R_x of cut-point rules. Suppose Judge J has a most-preferred or ideal cut-point rule $r(x;\bar{y}^J)$. For instance, liberals may prefer one rule while conservatives may prefer another. Given an ideal rule, we can represent Judge J's preferences over dispositions with a utility function of the form

$$u(d,x;\bar{y}^J)=\begin{cases}h(d,x;\bar{y}^J)\text{if } d=r(x;\bar{y}^J)\\ g(d,x;\bar{y}^J)\text{if } d\neq r(x;\bar{y}^J)\end{cases} \quad (2)$$

In words, Judge J receives the payoff $h(\cdot)$ from the correct disposition of the case (the disposition that application of her ideal rule would yield) and the payoff $g(\cdot)$ from the incorrect disposition (a disposition contrary to that resulting from application of her ideal rule).[14]

Specifying the $h(\cdot)$ and $g(\cdot)$ functions creates families of dispositional utility functions. Obviously, a key assumption is that $h(d, x; \bar{y}^J) > g(d, x; \bar{y}^J)$, that is, the correct disposition of a case is better than the incorrect disposition of the same case (except possibly at $x = \bar{y}^J$ where the justice may be indifferent between the two dispositions). An assumption that is often made, and which frequently proves extremely consequential, is that $h(\cdot) - g(\cdot)$ is increasing in the distance of the case from the cut-point. Roughly speaking this assumption means, incorrectly deciding "easy" cases is worse than incorrectly deciding "hard" cases.

Table 2 indicates the more common dispositional utility functions employed in formal models of judicial action, along with a sample of papers using the function.

Table 2. Examples of Dispositional Utility Functions Employed in Recent Formal Models of Courts.

Type	**Utility Function**	**Employed In**
Constant Loss	$u(d; x) = \begin{cases} 0 \text{if correct} \\ -\lambda \text{if incorrect} \end{cases}$	Badawi and Baker (2015)
Constant Gain	$u(d; x) = \begin{cases} 1 \text{if correct} \\ 0 \text{if incorrect} \end{cases}$	Cameron and Kornhauser (2006); Cameron et al. (2000); Carrubba and Clark (2012)
Linear Loss	$u(d; x) = \begin{cases} 0 \text{if correct} \\ -\lvert\bar{y}^J - x\rvert \text{if incorrect} \end{cases}$	Cameron and Kornhauser (2013); Fischman (2011)
Linear Gain	$u(d; x) = \begin{cases} \lvert\bar{y}^J - x\rvert \text{if correct} \\ 0 \text{if incorrect} \end{cases}$	Lax (2007)
Symmetric Linear	$u(d; x) = \begin{cases} \lvert\bar{y}^J - x\rvert \text{if correct} \\ -\lvert\bar{y}^J - x\rvert \text{if incorrect} \end{cases}$	Beim et al. (2014); Callander and Clark (2016)

Notation: x=case, d=disposition of the case, $\bar{y}^i$ =Player i's most-preferred cut-point.

With the simple apparatus of Equations (1) and (2), one can easily derive induced preferences over policies rather than dispositions per se. To evaluate how J compares a rule with arbitrary cut-point y to her ideal rule employing $\bar{y}^J$, note that J's utility differs only when the disposition dictated by the policy y is "incorrect" according to J's ideal policy $\bar{y}^J$. Her utility then is just the integral of the losses $g(d, x; \bar{y}^J)$ over the set of incorrectly decided cases.[15] By artful choice of $g(d, x; \bar{y}^J)$ and the distribution of cases, one may derive very simple expressions for policy utility. For example, integration of the linear loss (dispositional) utility function in Table 2 over a uniform distribution of cases on the interval $\left[-\frac{1}{2}a, \frac{1}{2}a\right]$ yields as policy preferences the scaled quadratic loss function $-\frac{1}{a}(y-\bar{y}^J)^2$. Similarly, integration of the constant-loss dispositional utility function in Table 2 over cases uniformly distributed on this interval yields as policy preferences the scaled tent utility function $-\frac{1}{a}|y-\bar{y}^J|$. Since policy loss functions of this sort have been widely used, for example in the separation of powers models, one may view Equations (1) and (2) as supplying micro-foundations for this line of inquiry.

The Supreme Court in Government: The Separation of Powers Models

In the early 1990s a group of policy-minded economists and rational choice political scientists—mostly congressional scholars—recognized an intellectual opportunity: By placing Congress, the Supreme Court, the President, and executive agencies in a common policy space, they could analyze legislating, rule-making, and judicial action in a unified and logical way. These "Separation of Powers" (SOP) models were a significant theoretical advance. These papers had the incidental effect—entirely unintentional it seems—of bringing modern institutional analysis to the study of courts.

Table 3. Separation of Powers Models by Decisional Mode: Selected Papers.

Decisional Mode	Typical Actors	Selected Papers
1. Statutory Interpretation	H, S, P, J	Ferejohn and Weingast (1992); Iaryczower, Spiller, and Tommasi (2002); Schwartz, Spiller, and Urbiztondo (1994); Stephenson (2006)
2a. Administrative Law—Procedural Review of Agency Rules	A, J	Bueno de Mesquita and Stephenson (2007); Cohen and Spitzer (1994); Eskridge and Ferejohn (1992); Ferejohn and Shipan (1990); Gely and Spiller (1990); Givati and Stephenson (2011); Stephenson (2007); Tiller and Spiller (1999)
2b. Administrative Law—Substantive Review of Agency Rules	A, J; or, H, S, P, A, J	
3. Constitutional Review of Statutes or Executive Action	J, C; or J, L; or J, P	Clark (2009); Fox and Stephenson (2011); Rogers (2001); Spiller and Spitzer (1992); Stephenson (2003); Vanberg (2001)

Notation: H = House of Representatives, S = Senate, P = President, A = Agency, C=Congress, J = Supreme Court, L = state or local government.

Table 3 indicates a selection of SOP models (broadly conceived), arrayed by the decisional modes of Table 1. Close inspection reveals two distinct waves of development. The first lasted from about 1990 to about 1995. Papers in the first wave typically treated SOP players as simple policy proposers or policy vetoers, assumed complete and perfect information, and highlighted particular sequences of moves across the branches of government. This sequence was seen as “a ‘natural’ sequence induced by the Constitutional structure of American government and the organizational practices of Congress” (Ferejohn & Shipan, 1990, p. 2).

The second wave began in the mid-2000s and continues today. Papers in the second wave were strongly influenced by the 1990s development of Contract Theory in economics (see, e.g., Bolton & Dewatripont, 2005). Second-wave papers tend to see Congress and the president as principals, and agencies and courts as agents. They often incorporate incomplete information and thus feature moral hazard, adverse selection, and signaling.

And, the second wave begins to explore differential expertise across the branches, a rational division of labor, and thus delegation from principals to agents, as well as the incentive effects of design decisions.

SOP Models of Administrative Review of Regulations

Somewhat curiously the SOP breakthrough occurred in the area of administrative law. Two notable papers, Ferejohn and Shipan (1990) and Gely and Spiller (1990), essentially created SOP models.[16]

We briefly sketch the model in the former paper. There is a unidimensional policy space. Each actor has an ideal policy (a point on the line) and suffers a loss linear in distance between the ideal point and the final policy in effect at the end of the game.[17] In addition, each actor suffers an epsilon loss from having its policy overturned. The actors include H (House, essentially the median congressman in a unicameral legislature[18]), C (a single-actor committee with gatekeeping power[19]), A (an agency, assumed to have the same ideal point as the president), J (a judge engaged in administrative review of Agency regulations), P (the President), and V (the key veto override player). A preexisting status quo is assumed. The sequence of play is: (1) Agency moves by setting policy; (2) Judge may veto Agency's policy, reestablishing the status quo [recall Table 1]; (3) Committee may release a bill to the floor of the House; (4) H, the median member of the House may modify the bill to any point she wishes; (5) the President may veto H's bill; (6) V may override the veto.[20]

Action in the model is rather complex, due to the many possible configurations of ideal points. But a few points stand out. First, the general idea for the Agency is to exploit the "gridlock region." The gridlock region is the portion of the policy space in which policies are invulnerable to change, due to the interlocking and cross-checking vetoes of the other players. The Agency should identify the policy within the gridlock region that it finds most attractive, and set its policy there. Second, the effect of judicial review (when it has an effect) is to shrink the gridlock region. In essence, if the Agency goes "too far" for the Judge, the court can strike down the regulation and thereby allow the legislative process to proceed based on the original and possibly vulnerable status quo. This will benefit the median congressman, at least in some configurations.

It is worth contrasting the basic SOP framework with the delegation model made famous by Epstein and O'Halloran (1999) and used in many other settings (see Bendor & Meirowitz, 2004; Huber & Shipan, 2002). In the delegation model, Congress delegates policy-making authority to an Agency, but only within a "zone of discretion." A policy set within this zone would correspond (in some sense) to the Agency following congressional

intent. Of course, it may well be that the Agency would prefer to act aggressively, ignoring congressional intent and exploiting the gridlock region to force an unwelcome policy on Congress, just like in the SOP model. But, in the Epstein-O'Halloran framework it is assumed a court reviews the Agency's actions and determines whether it acted within the zone of discretion. In essence, the judge reviews the Agency's statutory interpretation. This threat of judicial review forces the Agency to adhere to the zone of discretion—and often allows Congress to delegate in circumstances that otherwise would preclude it. Critically, the court is assumed to act as a mechanically faithful agent of Congress. In some sense, then, Congress delegates policy-making to a possibly unfaithful Agency but also delegates policing the Agency to an utterly faithful court. It is the second delegation (not much emphasized in Epstein & O'Halloran, 1999) that allows the first one to work.

In the SOP framework, however, the judge is a policy maximizer, not a mechanically faithful agent. J doesn't review the Agency's compliance with congressional intent; the judge simply evaluates whether she prefers the Agency's regulation to what will ultimately result if she strikes it down. The presence of a non-faithful judge also renders a congressional expression of a "zone of discretion" entirely nugatory since the only enforcer of congressional intent is Congress itself.[21] Not surprisingly, there is no real delegation or interpretation of congressional intent in the SOP models, only a struggle of wills.

The second-generation models do not really come to grips with this "delegation dilemma." But they are much more sensitive to the policy instruments available to agencies and the potential trade-offs they induce (Tiller & Spiller, 1999, examines this topic, pursued in Givati & Stephenson, 2011). A novel and potentially powerful insight addresses the effects of judicial review on agency incentives to work hard and invest in expertise (Stephenson, 2007). Here, the key point is similar to that of Aghion and Tirole (1997): Meddling by a principal (here, the judge) de-motivates an agent (here, the agency). De Mesquita and Stephenson (2007) explore the point with even greater nuance, noting that judicial review induces the agency to divert effort from important but relatively unobservable dimensions (e.g., quality of the regulation) to less important but easily observable ones (procedural regularity). The authors thus extend the ideas in Holmstrom and Milgrom (1991) to an important political setting.

SOP Models of Statutory Interpretation

Following the initial SOP models of agency review, several authors modified the framework to address statutory interpretation. In this context, the court is not a veto

player but an actual policy setter (recall Table 1). So, for example in Ferejohn and Weingast (1992), the sequence of play is (1) J sets policy; (2) C may release a bill to the floor; (3) unicameral H may modify the bill and establish a new policy. Comparison of this sequence of play with that in Ferejohn and Shipan (1990), discussed in the previous section) reveals that the court has simply replaced the administrative agency as the policy setter. And when acting as a policy maximizer, the court exploits the gridlock region, just like the Agency did in the SOP administrative law model.

One may question whether equating a court engaged in statutory interpretation to an agency engaged in regulation -writing actually captures what is typically meant by the phrase “statutory interpretation.” In the legal academy, judicial interpretation of statutes is seen as disambiguation of unclear language, resolution of contradictory language, or completion of incomplete or missing language. Building models that embrace that conception of statutory interpretation would probably require going beyond the “points on a line” framework of the SOP models.[22]

Second-wave models again explore perspectives incorporating incomplete information; but they retain the same basic understanding of statutory interpretation (see, e.g., Iaryczower et al., 2002; Stephenson, 2006).

Though they do not offer a formal model, later papers by a pioneer of SOP models begin to sketch a more radical departure (Ferejohn, 1998; Ferejohn & Kramer, 2002). In essence, these papers draw attention to the possible “labor contracts” between the Principal (Congress) and the Agent (the Court). They note that the Constitution severely restricts the ability of Congress to write a labor contract using high-powered incentives—wages, firing, reassignment, demotion—that would compel the agent to deliver what the principal wants. But, the judiciary itself is quite vulnerable to congressional attacks. In such an environment, how would judicial agents come to understand the job of statutory interpretation? Might they internalize a norm of self-restraint? How might such a norm operate in practice? These remain open questions.

SOP Models of Constitutional Review

Somewhat surprisingly, perhaps, constitutional review has received relatively little analysis within the SOP tradition, perhaps because of the limited options for legislative responses, at least within the stark SOP framework. However, three very interesting papers address the institution of constitutional review itself, arguing that the practice is valuable to other important players such as voters or legislators (Rogers, 2001; Stephenson, 2003; Vanberg, 2001). In addition, Clark (2009) argues that the Supreme Court responds to the introduction of court-curbing legislation, not because of the genuine

threat of its enactment but because it demonstrates a deteriorating level of public support for the Court. This conception of judicial self-restraint somewhat echoes the arguments in Ferejohn and Kramer (2002).

Empirical Explorations

We would be remiss not to mention the very small empirical literature attempting to evaluate the SOP models. This literature is comprised of Spiller and Gely (1992), Segal (1997), Bergara et al. (2003), and Segal et al. (2011).

We will not review these studies in detail but offer three observations. First, empirically placing so many actors into a common space is difficult methodologically. So, accounting for standard errors for ideal points is surely important. But none of the studies do so, or do so very explicitly. Second, a major insight of the SOP models is that courts usually are unconstrained in their actions. Finding configurations where all the branches of government lean one way ideologically and the courts another, proves difficult. So, a "small n" problem is likely to be bothersome. Finally and very significantly, the SOP models all take place in policy space and thus make predictions about the policies coming from the Supreme Court. Unfortunately, empirically measuring those policies is very difficult (but see Clark & Lauderdale, 2010). On the other hand, observing case dispositions is very easy; as a result, the empirical studies rely on case dispositions. In short, the SOP theories address cheese but the SOP empirics examine chalk. This fundamental disconnect renders the existing studies problematic. In our judgment the jury remains out on the empirical bite of the SOP models.

Theories of Dispositional Voting and Policy Choice

The U.S. Supreme Court employs a remarkable and highly distinctive voting procedure, one employed in no legislative body though it is used in some independent regulatory commissions. From a formal perspective, theories of Supreme Court decision-making are essentially attempts to analyze the properties of this unusual voting procedure. And, the history of formal theories of Supreme Court decision-making is a movement from models that assumed the Court follows congressional or congressional-like procedures, to models that take the Court's decisional procedure much more seriously.

The reason why the Court's voting procedure is so unusual is that a typical case produces not one outcome but two (recall Table 1). That is, in every case there is a case disposition, and in many cases there is a policy choice. The voting procedure must be capable of producing both outcomes.

Roughly speaking, the voting rule produces the two outcomes in the following way. First, there is a division of the Court by the favored disposition. This division employs simple majority rule. Justices in the dispositional minority coalition cast a vote of "dissent." Things are more complicated within the dispositional majority coalition. There, a majority-side justice is selected to write an "opinion" offering a policy that, when applied to the instant case, yields the majority's disposition. (This requirement is dubbed "dispositional consistency" in Cameron & Kornhauser, 2009.) The designated author is selected by the senior judge in the majority dispositional coalition, often the chief justice. However, other justices in the dispositional majority may offer opinions as well. The justices in the majority dispositional coalition (and only those justices) may then endorse one or more of the proffered policies using a "join/concur" system. That is, if a justice "joins" an opinion, the justice endorses the policy specified in the opinion. If an opinion receives five or more majority-side endorsements in the form of "joins," then it becomes the Court's opinion and its policy prescription is the Court's prescription. If no opinion receives five joins, then the Court offers no policy prescription though of course it does supply a case disposition. A justice in the majority dispositional coalition is not required to endorse any opinion (she may simple "concur" in the disposition); a justice may join several opinions; and (at least in principle) several opinions may achieve the threshold quota of joins. So, there is nothing like a primary or a runoff between contending majority opinions. Because the size of the dispositional majority coalition may range from five to nine (assuming a full nine-member Court), the required quota for endorsements (five) ranges from unanimity to simple majority.

It seems fair to say that the properties of this complex voting procedure are not yet fully understood. Indeed, there is no consensus on exactly how to model it. Still, many analysts have tried, with arguably interesting results.

We organize our review loosely around the equilibrium solution of the proposed games. This organizational structure closely parallels the historical development of the literature that, as we noted above, largely emerged from the introduction of a judicial actor into separation of powers models. The SOP models treated the court as a unitary actor, justifying that assumption by an implicit or explicit reliance on the median voter theorem. This move thus identified the policy preferences of the Court with the policy preferences of the median justice.[23] As we discuss more fully below, this assumption is probably unwarranted with respect to the policy outcome because the voting procedure almost surely yields non-median policy outcomes.

Median Justice Models

We begin with the implicit model that underlies much of the empirical work on courts as well as standard accounts in the press that emphasize the "median justice" or "swing justice." This phrasing occurs both in discussions of the likely outcome in particular cases and in the appraisal of nominations.

Hammond, Bonneau, and Sheehan (2005) presented several formal models of a collegial (multi-member) Supreme Court. Their book offers several different models. We begin with what we shall call the "median judge" model, the equilibrium of which is the ideal policy of the median judge. [24]Jacobi (2009) takes a similar approach; she offers three distinct models of a collegial court, one of which (the "ideological model") yields the median judge equilibrium. We treat these models together as they share a common structure.

In these models, judges have spatial preferences over a one-dimensional policy space. These preferences are typically consequential rather than expressive. In the median judge versions, judicial preferences are exclusively over policies; adding costs to deliberation or writing converts, as we shall see, these median judge models into author-influence models.

In addition, these models assume the existence of a status quo point; thus, the typology in Table 1 would classify them as models of judicial review rather than policy choice. Yet the models assume that the Court is a policy chooser rather than a veto player. The models thus conflate two different judicial policy-making processes into a single model that appears to capture neither function accurately.

Neither author fully specifies a noncooperative game, including the sequence of play. Instead, Hammond et al. rely on the median voter theorem to conclude that the court chooses the ideal policy of the median justice. Jacobi gives a more extensive analysis tied more tightly to the characterization of judicial preferences.

These models make very strong and quite notable predictions. For example, they predict that the policy content of the majority opinion is independent of the dispositional vote on the case. So, it makes no difference whether the dispositional vote was 9-0, 5-4 with a liberal winning dispositional coalition, or 4-5 with a conservative winning dispositional coalition—the majority opinion content is always the same. In addition, the median models predict that the author to whom the majority opinion is assigned makes no difference for the opinion content. So, on the long Rehnquist Court, opinions assigned to Justice Stevens and those assigned to Justice Scalia all yielded the same policy outcome. Most close observers of the Court (including in our experience direct participants) find

these predictions strikingly counterfactual. The very scant systematic empirical evaluation of these predictions has been unrelentingly harsh (Clark & Lauderdale, 2010). And indeed they follow from assuming a counterfactual voting procedure.

Lax (2007) offers a more intriguing approach to a "median judge" result. In this model, each justice has preferences over dispositions that are separable across cases.[25] That is, Justice J's preference for one disposition over another in case x is independent of her preference for one disposition over another in case x'. Notice that, for each case, the disposition endorsed by the median judge always prevails under majority rule. As in the policy space models, Lax posits that justices vote only between two alternatives; the dichotomous nature of voting is much more plausible in the context of votes on dispositions than in the context of votes over policies. Generally, the Court has only two dispositions from which to choose; but many policies are consistent with either disposition. Choosing over policies thus generates a more complex game in which we must attend both to the nature of competition among policies and the exact voting procedure adopted.

Of course, the median judge result is neither surprising nor insightful when we focus on the results of a single case. Lax, however, asks us to consider the implicit rule or policy that the case-by-case process of adjudication yields. He proves that we may regard this implicit collegial rule (as Lax calls it) as a median rule.

To understand this claim, recall our earlier discussion concerning the relation of dispositions to rules. Rules are simply a function from the set X of cases into the outcome set O. Thus, as Lax's judges decide cases, an implicit rule emerges.[26] Unless the preferences of the judges on the court satisfy a restrictive condition, the implicit collegial will not be the rule of any judge though it will be perfectly predictable and a case-by-case median. As we will see, this result is sensitive to the structure of judicial preferences.

Author-Influence Models

A number of models have non-median equilibria. Most of these can be interpreted as author-influence models though two simply have a non-median outcome.

In an imaginative and unjustly neglected article, Schwartz (1992) offered the first author-influence model. This model predates the first median judge models by many years; it also pays closer attention to the actual decision processes of the Court than the median judge models and many non-median models of today. Schwartz attributes consequential preferences over a two-dimensional space of policy and precedential force to judges. The projection of judicial preferences on to the policy dimension is the standard spatial

preferences. Preferences over precedential force are harder to describe. Basically, as the announced policy moves further from the judge's ideal point, the less precedential force the judge would like to accord it.

Schwartz assumes that, in every case, the Court chooses between two policies. Though this assumption is central to the results, it is *not* an assumption that there is a status quo. Rather Schwartz assumes that there is a specific policy associated with affirmance and one associated with reversal. In this context, he shows that the author of the opinion can influence the location of the majority opinion. Given this influence, the judge with the power to designate the opinion author is also important.

Hammond et al. (2005) transfer Romer and Rosenthal's "setter" model from the legislative and referenda settings (Romer & Rosenthal, 1978). Again, the justices have consequential spatial preferences over a one-dimensional policy space; again the justices choose between a status quo policy and some Court-produced policy. This game thus shares the conflation of a model of a veto player in which the court may strike down a policy announced by another player with a model of the Court as a policy-maker.

In this game, further, they assume the author of the opinion presents her opinion to the Court under an exogenous legislative "closed rule" (no amendments or alternatives allowed). From this assumption the assignment of the opinion to a specific justice strongly influences the outcome. However, as we noted above, the actual voting practices of the Supreme Court are very fluid. Any justice may write an opinion that "competes" with the opinion of the justice designated to write the majority opinion. So the closed-rule assumption appears very strong.

Jacobi (2009) offers two models (her "collegial" and "strategic" models) that yield non-median results. Strictly speaking, these are not author-influence models because there are no authors in the models. Spatial preferences remain consequential and over a one-dimensional policy space. Again, the model assumes a status quo policy that suggests the Court is a veto player even though the Court chooses a policy. In the collegial model, the Court seeks to maximize the number of joins to the majority opinion. In this model, the Court rather than an actual justice apparently chooses the join maximizing opinion location. Similarly, in the strategic model, it is difficult to determine the sequence of play and which judge makes an initial proposal and who a counterproposal.

Lax and Cameron (2007) offer a somewhat more plausible model of author influence. Justices have consequential, spatial preferences over a one-dimensional policy space and choose policies, but policies differ in quality. There is no status quo point; the model is thus a consistently formulated model of statutory interpretation. In the model, high-quality opinions are more costly to produce. It is this cost, even in the presence of

potential competition from the opinion of another judge, that undergirds the author-influence result. Although only one potential entrant is considered, the model begins to capture the fluidity of the Court's actual voting procedure.

Cameron and Kornhauser (2009) is set in case space and the location of the case before the court has a significant impact on the location of the policy. The model attributes a complex set of preferences to judges: All judges have constant-loss expressive preferences over dispositions, expressive spatial preferences over a one-dimensional policy space, and incur a cost when they seek to avoid the expressive policy loss (e.g., a writing cost to dissent). The opinion writer in addition seeks to maximize the number of joins to the opinion. The model is a consistent model of statutory interpretation.

Although complex, this model has a number of interesting consequences. First, as noted above, case location strongly influences the location of the ultimate opinion. Second, a judge's dispositional vote may be strategic. She may endorse a disposition contrary to the one she thinks correct if the dispositional loss is sufficiently low and the expressive cost of dissent sufficiently high. Indeed, when expressive costs are sufficiently high, all opinions will be unanimous and located at the ideal point of the opinion writer. Thus, for non-extreme case locations, the equilibrium exhibits both strategic dispositional voting and an author monopoly. Third, opinion location is non-monotonic in the ideal point of the opinion author.

The model, however, also has several implausible assumptions. First, the opinion writer and non-writing judges have different preferences. Second, the only consequential preference of any judge is the opinion writer's preference for joins. A more reasonable assumption would attribute consequential preferences for either the court's disposition of the case or its policy choice. Third, there is no opinion competition.

Finally, we consider Fischman (2008), although the model is aimed at the three-member panels of the U.S. Courts of Appeals.[27] Judges in this model have linear loss preferences over dispositions. Dissents, however, are costly to both the non-unanimous majority and to the dissenter. As a consequence, when the court decides a case that is located far from the minority justice but close to the two majority justices, equilibrium consists of a unanimous decision for the minority disposition. Such a result was impossible in Lax (2007), which produced a median rule if not always a median judge. Thus, the introduction of costs to dissent breaks the "median of dispositions" equilibrium.

Mean or Median-of-the-Majority Models

In a consistent model of statutory interpretation, Carrubba et al. (2012) develops a model in which the equilibrium is roughly the central tendency of the ideal points of the justices

in the dispositional majority. Judges in this model have both expressive and consequential preferences over dispositions and policies. Policy preferences are spatial over a one-dimensional policy space. In addition there is a cost to expression. The authors assume, however, that parameter values are such that no strategic dispositional voting occurs.

To solve the game, the authors employ a cooperative solution concept—essentially the core—to a simple voting game. The key feature and major innovation of this voting game is that it restricts the electorate to those judges in the dispositional majority. This assumption immediately implies the importance of case location to opinion location. The reason is, the case location determines the dispositional majority, with those judges whose ideal point lies to the left of the case location forming one coalition and those whose ideal point lies to the right forming the counter coalition.[28] Then, only the preferences of justices in the dispositional majority affect the location of the forthcoming policy.

This model has several important features. First, a majority opinion does not always issue. Its existence will depend on the spacing of the judges, the case location, and the costs of expression. Indeed, with sufficiently low costs of expression, there is never a majority opinion as each judge chooses to concur. Second, when a majority opinion exists it is either the ideal point of the median member of the majority opinion coalition or the point closest to that median that creates a majority opinion. When judges are equally spaced on the line the median of the coalition majority will be the median member of the majority.[29] More broadly, majority opinions cluster near the ideal point of relatively homogeneous groups of judges. The presence of blocs on the Court thus has great importance.

The result in this model depends critically on the assumption that judges do not vote strategically on dispositions. If strategic dispositional voting were possible, majority opinions might move toward the center of the Court. In addition, it would be illuminating to support the cooperative equilibrium with a noncooperative game that yielded that equilibrium. The assumption of a cooperative game exhibits the fluidity of the actual voting procedures of the court, but one might believe it does not illuminate them. It would be interesting to understand how the equilibrium in this model varies with the distribution of judicial ideal points.

Majority Sequential Bargaining

Cameron and Kornhauser (2013) offers a noncooperative bargaining model that yields as limit results many of the prior results. It too is a model of statutory interpretation. Judges

have expressive preferences over dispositions and consequential linear loss preferences over policies in a one-dimensional space.

The model marries the key insight of Carrubba et al. (2012)—that the dispositional majority determines opinion content—to the sequential bargaining apparatus of Baron and Ferejohn (1989) and Banks and Duggan (2006). In addition, it incorporates some of the features of the Court's peculiar voting rule, such as the five-vote endorsement quota for majority opinions.

The timing of the game is important. First, nature selects a case. Next the judges cast dispositional votes. Third, nature randomly selects an opinion author from the dispositional majority. The designated author proposes an opinion on which the dispositional majority votes. If the proposed opinion gets a majority of *the court*, the game ends. Otherwise, nature randomly selects another member of the dispositional majority to propose an opinion. In effect, the authors model the Court's procedure as an infinite horizon, sequential bargaining game with random recognition and a k-majority decision rule (where k is a majority of the bench, five on the U.S. Supreme Court). This structure captures most of the key features of actual procedures: a designated opinion author who faces potentially fierce opinion competition and requires five joins from ideologically heterogeneous colleagues.

Three parameters play key roles in the analysis; limit values yield some of the prior results as equilibria. As in other case space models, case location is important. When the judges vote sincerely over dispositions, the case location splits the Court into the two dispositional coalitions. Although a judge may vote strategically on the disposition in order to become a member of the dispositional majority, doing so significantly restricts the range of opinions that the judge can propose should she be the designated author. (This follows from disposition consistency: A proposed rule must yield the majority disposition when applied to the case in hand.) As in other sequential bargaining models, the discount rate—perhaps better interpreted here as a measure of bargaining toughness or case importance—also plays an important role. This parameter introduces a cost to delay and thus plays a role parallel to the cost of expression in prior models. Finally, the dispositional gain from voting sincerely plays an important role. When judges value sincere dispositional votes highly, the majority opinion coalition lies in the dispositional majority. Otherwise it need not; the equilibrium majority opinion coalition may endorse the "wrong" disposition.

The model displays a pronounced endogenous first-mover advantage that accrues to the assigned opinion author. Even so, the structure of bargaining induces judges to propose compromise opinions, particularly when the author is an ideological outlier. In unimportant cases, each judge announces her ideal point; in very consequential cases,

tough bargaining drives opinion locations toward a weighted center of the dispositional majority.

To achieve these results with closed-form solutions, the authors consider only three blocs of judges—liberal, moderate, and conservative—that may vary in size.[30] This assumption is obviously somewhat unreasonable. In addition, the structure of sequential bargaining requires a majority opinion even though in roughly 5% of decided cases, only a plurality opinion results.

Other Approaches

Iaryczower and Shum (2012) offers an unusual model of dispositional voting on a collegial court. The model is based on Condorcet Jury Theorem (CJT) models in which voters wish to achieve a correct outcome from a dichotomous choice but receive private signals about which outcome is correct. So, the model is essentially a team model of a multi-member court, because in a full information world all the judges would agree on which disposition was correct.[31] However, the model allows some judges to receive higher quality signals than others (i.e., these judges are more skilled) and also allows some judges to use an ideologically biased evidentiary threshold. A nice feature of the model is the way it translates seamlessly into an empirical structural model of scaling, allowing the recovery of skill and bias parameters from data on dispositional votes. Although the authors apply their model to dispositional votes from the U.S. Supreme Court, this Court rarely engages in purely dispositional voting (recall Table 1). The model is perhaps best seen as an innovative approach to decision-making on collegial civil law courts, which typically offer dispositions without policy-making.

A sizable literature with roots in social choice theory examines collegial court decision-making. Much of this literature addresses a new problem in social choice, paradoxes of judgment aggregation (Kornhauser, 1992b; Kornhauser & Sager, 1993). This literature is too expansive to review here but interested readers are directed to List and Puppe (2009) for a survey.

Conclusion

Modern institutional analysis was slow to come to the study of the U.S. Supreme Court. As late as 1990, even rudimentary ideas like “the median voter” were terra incognita. But then modern institutional analysis arrived with a bang. Two and one-half decades later, a survey of models of the Court in the judicial hierarchy (Kastellec, 2016), as a member of

the constitutional separation of powers system, and as a collegial decision-making body, demonstrates that theorizing about the Supreme Court arguably matches in range, depth, and insight that developed for Congress. From the least theorized branch of government, the Supreme Court and the federal courts have become one of the better theorized branches.

But the fact of remarkable progress does not imply all is well in River City. Much remains to be done. In closing we note some of these opportunities.

The SOP models have probably reached the limits of the original framework. Further progress requires departures in at least two different directions. First, the models need to consider more explicitly the implications of the restricted labor contract between Congress and its agent, the Supreme Court. The operation and origin of internalized norms of self-restraint are not beyond the ambit of formal theory. Second, the models need to explore more seriously the division of labor between Congress and the Court and their respective specializations and expertise. This effort will almost certainly require more serious consideration of how case-by-case adjudication works.

With respect to collegial policy-making, we still lack a canonical model that can serve as the core for more extended analyses—for example, of opinion assignment, of case selection, of the effects of Supreme Court nominations—and as the driver of empirical scaling methods. Still, progress has been made and we are optimistic more lies ahead.

Finally, we have said almost nothing about litigants. The U.S. Supreme Court does not hold an unrestricted hunting license; before it can act, litigants must bring it cases. Although empirical literatures address the behavior of litigants, very little formal theory has been brought to bear on litigation strategy and its interaction with Supreme Court decision-making. This area represents a rich area for new theory.

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Notes:

(1.) As a simple example of this slow arrival, the first application of the median voter theorem to the Supreme Court that we are aware of occurred in 1990 in unpublished working papers on nominations by Stewart and LeMieux. A simple Google n-gram of “median justice” suggests that the term did not enter common usage until the early to-mid-2000s.

(2.) In a few cases, a litigant may approach the Supreme Court directly.

(3.) On very rare occasions, the Court in effect avoids a decision by stating that *certiorari* was improvidently granted.

(4.) We might understand *O* as an outcome space for judicially articulated rules; many legislative rules, such as the Internal Revenue Code, have a more complex outcome space. In the case of the IRC, the “disposition” in the outcome space is the amount of tax

owed (or if negative when the taxpayer benefits from the earned income tax credit) an amount to be received. The generally dichotomous nature of the judicial outcome space arises from the substantial discretion in determining the remedy that is given to trial court judges and finders of fact. The notation distinguishes dispositions from rules because a court may dispose of a case even when it does not announce a majority rule.

(5.) Through appropriate definition of the case space (e.g., intrusiveness of search, entanglement of church and state, likelihood of harm to returned political asylum seeker), this approach is much more flexible than it might initially appear.

(6.) We can interpret the case space in a variety of different ways. The name suggests first that it refers to the set of cases that arise in court or that the court will decide. The strategic nature of settlement means that this set of litigated cases is a biased selection from the set of disputes to which a rule gives rise. So, one might interpret the case space as the set of disputes to which the rule gives rise. More broadly, the set of cases might refer to the set of behaviors to which the rule gives rise. In the speed limit example, this set of behaviors is the distribution of speeds at which the traffic circulates.

(7.) Some European civil law systems have constitutional courts or bodies that may review the constitutionality of statutes separate from a given case. The U.S. Supreme Court has always rejected this practice as prohibited by the “cases and controversies” provision of the U.S. Constitution.

(8.) The reader should appreciate that we summarize the state of art after 25 years of development. Needless to say, along the path of development, many modeling practices were tried and consensus remains distant.

(9.) Review on constitutional grounds is also possible.

(10.) Note that the Court may also engage in procedural rule-making, a form of statutory interpretation establishing procedural standards for agency rule-making.

(11.) In *Chevron v. NRDC*, the Supreme Court instructed courts to follow a two-step procedure. In the first step, the court must determine whether congressional intent was clear. If not, the Court must defer to the agency interpretation of the statute; if congressional intent was clear, then no deference is given and the Court may provide its own interpretation of the statute.

(12.) The idea of what we dub a block-veto was introduced in an extremely creative paper, Spiller and Spitzer (1992). The small literature on policy floors and ceilings has some applicability, see Cremer and Palfrey (2000, 2006). Cameron (2005) provides a judicial application.

(13.) Current models of constitutional review do not distinguish between “as applied” and “facial” challenges to a statute.

(14.) Careful readers will note that Equation (2) is a consequential utility function since it is defined by the actual disposition of the case. But it is easily modified to become an expressive utility function if the critical entity is not the case disposition itself but the judge’s vote on the disposition. In addition, Equation (2) applies to any rule not just cut-point rules.

(15.) To be perfectly correct, in calculating this integral we should take into account that the distribution of cases may vary with the prevailing rule; that is, the set of cases arising under the policy y may differ from the set of cases arising under the policy $\bar{y}^J$. This adds a degree of complexity but, with simple assumptions about how the distributions shift, not an undue amount. For early efforts to implement this idea, see Parameswaran (2014) and Ainsley et al. (2015).

(16.) Marks 2015 (orig. 1989), a doctoral dissertation, noticed that a Court and Congress could be represented in a common policy space. However, the work does not really explore the resulting strategic interactions.

(17.) So, utility is consequential rather than expressive.

(18.) The assumption of a unicameral legislature allows the authors to side-step bargaining between the two chambers. The assumption probably underplays congressional deadlock, including through the use of the filibuster in the Senate.

(19.) The emphasis in Ferejohn and Shipan (1990) on committee power is somewhat unusual in the SOP literature.

(20.) The paper does not actually model vetoes and overrides in detail but just identifies policy proposals that will survive a veto.

(21.) If J’s ideal point is close to H’s, then it will act in H’s interest, but only because the action is in J’s interest.

(22.) As we noted earlier, analysts of presidential power employ a setup almost identical to that in Ferejohn and Weingast (1992), but view the initial mover as an activist president using executive orders or memoranda to direct the federal establishment; see Moe and Howell (1999) and Howell (2003). These models have become workhorses in presidential studies where the fit between the model and the phenomenon studied is arguably rather tight.

(23.) Ferejohn and Shipan (1990) and Gely and Spiller (1990), for example, simply treat the Court as a unitary actor. The earliest paper of which we are aware that explicitly understands the Court as a "median judge" model is Lemieux and Stewart (Working Paper, 1991). They study nominations to the Supreme Court and treat these nominations as a move-the-median game of judicial appointments.

(24.) This model appears to have been developed in 1999 and presented at an APSA meeting.

(25.) Lax does not clearly specify whether the preferences are expressive or consequential. Understanding the preferences as expressive provides the better interpretation as it ensures that the equilibrium is unique. With consequential preferences there are many equilibria, many of them quite counterintuitive (e.g., when each judge prefers disposition 1 to disposition 0, a unanimous vote for disposition 0 is a Nash equilibrium).

(26.) The separability assumption insures that the court is "committed" to the emergent rule.

(27.) The published version Fischman (2011) of this paper uses a simpler theoretical model in which the phenomenon discussed in the text cannot occur.

(28.) This conclusion about coalition formation rests on the assumption of nonstrategic dispositional voting.

(29.) For some case locations there may be multiple equilibria.

(30.) If the blocs are of equal size, the model is one of three-judge panels on intermediate appellate courts. There the results are particularly simple.

(31.) Utility is expressive so the complex strategic problems that can arise in CJT models are avoided here.

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