

Bargaining on Appellate Courts

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Abstract

We present a sequential bargaining model of a multi-member appellate court that extends similar models developed to study legislatures. In the model, judges decide a case and announce a legal rule compatible with the case decision. They employ a unique voting rule common to U.S. appellate courts: a compound rule in which all members of the Court vote on the case disposition using pure majority rule, but only the members of the majority dispositional coalition vote on policy. To achieve a definitive rule, the policy vote must reach a threshold equal to a numerical majority of the entire court. We model policy voting as a sequential bargaining game with random recognition, and allow strategic voting at the dispositional stage. The model offers new insights on strategic dispositional voting, and the impacts of case importance, ideal point distributions, and case locations on case dispositions and the content of majority opinions.

JEL Codes: C78, H8, K40

I. Introduction

American appellate courts employ four procedures that distinguish them from other multi-member political institutions such as legislatures, juries, administrative agencies, or committees.¹ First and foremost, appellate courts jointly produce a case disposition and a rule. Judges both render judgment, disposing of the case before them, and give reasons for their judgment in an opinion that typically announces a rule or policy.² Second, and as a consequence of the first, the members of appellate courts employ a unique compound voting rule to jointly determine the case disposition and policy content of the majority opinion. In particular, majority rule with "universal suffrage" determines the disposition of the case. But a radically different rule governs rule-making: only those judges in the dispositional majority participate in determining the policy the Court will announce in the majority opinion. Moreover, a definitive policy requires the assent of a majority of the *court*. Consequently, when the dispositional vote is non-unanimous, the voting rule on policy is a super-majority rule, indeed, in some cases, a unanimity rule.³

Third, although a particular member of the dispositional majority is tasked with authoring an initial opinion articulating a rule justifying the disposition, his or her opinion may face considerable competition or demands from other members of the dispositional majority. This bargaining is quite unstructured.⁴ Fourth, the initial division over the case disposition may reflect strategic voting. Strategic dispositional voting attempts to alter the subsequent bargaining over the opinion. In other words, justices may vote insincerely on the case disposition in order to change the identity of the opinion bargainers and thus the content of the majority opinion. Whether they do so presumably depends on the costs and benefits of sincere versus strategic voting.⁵

In this paper, we present a model of multi-member decision-making that incorporates all four of these distinctive features. Thus the model analyzes an appellate court, not a re-labeled model of a legislature (which announces a policy but does not dispose of a case) nor a re-labeled model of a jury (which disposes of a case but does not announce a policy). In order to

incorporate the disposition-rule dichotomy, the model is set in case space (Kornhauser 1992a and Kornhauser 1992b, Lax 2011) so case dispositions follow logically from the application of general rules to specific cases. The model has two broad stages that correspond to the two decisions required of the Court. The initial stage consists of a vote on the case disposition; the next stage consists of a non-cooperative game-theoretic model of bargaining within the dispositional majority over the content of a majority opinion consistent with the majority's disposition. Hence, the model distinguishes voting on the case disposition from voting (via so-called joins and concurs on the US Supreme Court) on a policy to be announced in a majority opinion. The outcome of the first stage determines the identity of the second-stage bargainers and places bounds on the possible policy decision, and strategic dispositional voting may further link the two parts of the game.

The model adapts the sequential bargaining approach developed by Baron and Ferejohn and others to study legislatures (Baron and Ferejohn 1989, Banks and Duggan 2000, Jackson and Moselle 2002, McCarty 2000, Kalandrakis 2010, *inter alia*) to the study of appellate courts. We know of no prior application of sequential bargaining models to institutions that use the peculiar voting rule that U.S. appellate courts commonly use: pure majority rule over the disposition followed by k -majority rule over policy with an electorate restricted to the members of the dispositional majority.

In the model there are n judges, with $n > 1$. Each judge has consequential preferences over policies or opinion content. We also include as a parameter an expressive preference for the correct disposition, given the judge's policy preferences. We provide a comprehensive, qualitative account of all equilibria when this expressive value is zero; and a complete characterization of equilibria when the expressive value is sufficiently high to ensure sincere dispositional voting in all cases. The game has three periods. In period 0, a case arrives at the court according to some exogenously given probability distribution over a one-dimensional case space. In period 1, judges vote on the disposition of the case and thereby determine the dispositional majority. As the dispositional vote is dichotomous, exactly one possible

disposition receives k or more votes, where k is the smallest integer greater than or equal to $n/2$. In period 2, the dispositional majority selects a policy. We model this policy selection as a sequential bargaining game among the members of the dispositional majority. A potentially infinite number of rounds of bargaining may ensue in the policy determination phase of the game. At the outset of each round, some member of the dispositional majority is designated to circulate a draft opinion. If that opinion attracts at least k joins, the game ends. If the opinion fails to attract sufficient joins, a new stage begins with the designation of an opinion writer. This approach to opinion competition reflects the relatively unstructured bargaining protocols typically employed on appellate courts. These protocols specify opinion assignment within the majority dispositional coalition but eschew amendment trees, closed or open rules, gate-keeping, and most other procedures familiar from legislative bargaining.

The model assumes the Court is composed of three blocks of judges, Liberal, Moderate, and Conservative. We assume the n justices are allocated over the three blocks. We pay particular attention to the case of $n = 9$, so we have in mind a stylized model of the U.S. Supreme Court. The model also embeds a complete analysis of a three-judge court; thus, as an immediate consequence, we also provide a model of decision making on the U.S. Courts of Appeals.⁶

Restricting the players to three weighted blocks is a strong simplification but it brings powerful advantages.⁷ In particular, some dispositional coalitions lead to a bilateral bargaining game within the dispositional majority, so we can derive strong results employing only sequential rationality (see Binmore 1987, Rubenstein 1982). This is not the case for unanimous dispositions, which may involve bargaining among all three blocks. As is well-known, with sufficiently patient players a folk-theorem construction will support many policy outcomes in this setting (Sutton 1986). We follow Baron and Ferejohn 1989 and subsequent papers and focus on stationary subgame perfect equilibria. These equilibria are typically unique and, arguably, have a focal quality. We are able to completely characterize stationary subgame perfect policy offers and policy voting strategies for all ideological make-ups of

all Courts and all discount rates, conditional on the majority dispositional coalition.

As in Rubenstein 1982, Binmore 1987, and Baron and Ferejohn 1989, an important parameter is $\delta \in [0, 1]$, typically interpreted as the bargainers' impatience during bargaining. In the judicial context, we think δ is better understood as a *toughness* parameter that measures the parties' willingness to compromise. High levels of δ lead to "tough" bargaining in which non-writers demand compromises from the opinion author if they are to join the majority opinion. Low levels of δ lead to softer bargaining in which non-writers are willing to join opinions with few compromises. Plausibly, δ rises with a case's importance, and with greater resources per case. Thus, changes in δ are readily interpretable as changes in substantively important attributes of cases such as their importance, or attributes of different courts such as case load and resources.

The model makes four substantive contributions to our understanding of appellate adjudication, as well as offering a novel application of the sequential bargaining approach to political institutions.

First, the model analyzes the impact of *strategic dispositional voting* on opinion content and case dispositions. Because strategic dispositional voting appears to be common in some appellate courts such as the U.S. Courts of Appeals, this analysis is arguably important.⁸ In the model, strategic dispositional voting can be quite consequential for opinion content. However, when the location of the case before the court lies within the interval spanned by the judges' ideal points, strategic dispositional voting does not alter the winning disposition. On the other hand, if the case is extreme (but not too extreme) and δ is sufficiently small, strategic dispositional voting may actually change the disposition of the case. Under strategic dispositional voting, unanimous dispositions are the predominant outcome (as they are on the U.S. Courts of Appeals).

Second, the *toughness or case importance* δ strongly affects the character of the bargaining. Although agreement is immediate, many values of δ lead ex ante to a *distribution of opinion locations* rather than a single location. The distribution reflects probabilistic opin-

ion assignment during the bargaining game over policy and the fact that values of δ even modestly lower than 1 lead to a pronounced first-mover advantage for the realized assignee. Indeed, for sufficiently low values of δ , the assignee is able to impose her most-preferred policy on the majority coalition. However, as δ goes to 1, the distribution of equilibrium opinion locations converges to a single point, so the first-mover advantage degrades. This convergence point and, when $\delta < 1$ the expected policy location, tend to be in the "center" of the dispositional coalition in a sense made precise below. Summarizing broadly, low values of case importance (δ) lead to policy outcomes reflecting the particularizing tendency highlighted by author-influence models of courts (e.g., Lax and Cameron 2007); high values of case importance (δ) lead to policy outcomes reflecting the centralizing tendency highlighted by median judge models (e.g., Hammond et al 2005). We emphasize, however, that the "center" reflected in the limit and in the expected policy, may deviate from the ideal point of the median judge on the Court, the ideal point of the median judge in the join coalition, or the ideal point of the median judge in the dispositional majority.

Third, the distribution of ideal points in the dispositional majority affects the location of both the expected policy in less important cases and the compromise policy in high importance ones. When one block contains k or more members (a "dominant" block) the compromise policy is the median of the dispositional majority. This is also true when the dispositional majority consists of two non-dominant but very unequally sized blocks, so one is "near-dominant." Otherwise, however, the compromise policy approximates the mean ideal point of the dispositional majority, as do expected policies. We note that because the model provides an explicit link between the ideological make-up of the Court and the expected policy outcomes flowing from it, the model has strong implications for theories of nominations and appointments. Although a full discussion is beyond the scope of this paper, the sequential bargaining model implies that Supreme Court nominations are a block-building/block-breaking game rather than a move-the-median game (Lemieux and Stewart 1990, Moraski and Shipan 1999, Krehbiel 2007, Cameron et al 2009).

In a block-building game appointments are often consequential, in contrast to a move-the-median game where they rarely are.

Fourth, the *location of the selected case* affects both the disposition of the case and the content of the majority opinion under both sincere and strategic voting. Hence, the model suggests that case selection matters in appellate jurisprudence because some cases conduce to particular policy outcomes rather than others. Again, a full discussion is beyond the scope of this paper, but a "bargaining vehicle" theory of case selection is quite different from current theories of certiorari highlighting control or learning in the judicial hierarchy (Cameron et al 2000, Carrubba and Clark 2012, Beim 2013).

The paper is organized in the following way. Section II presents the model. Section III examines policy bargaining within the dispositional majority. For clarity of exposition, we focus on bargaining majorities created by sincere dispositional voting. Section IV analyzes sophisticated dispositional voting. Section V concludes. Most formal results are relegated to Appendices.

II. The Model of a Multi-member Court

The players are three blocks of justices – liberal, moderate, and conservative – with respective block sizes L , M , and C . (Without undue confusion, we also denote actions of the blocks using superscripts L , M , and C). The total number of judges $n = L + M + C$. An example of $n = 9$ is the U.S. Supreme Court; in the U.S. Courts of Appeals $n = 3$. The task of the justices is twofold: *first*, to dispose of the case in hand using pure majority rule, and *second*, to propose and pick a legal rule using a k -majority rule within the dispositional majority coalition. A policy is a proposal (a “draft opinion”) from a judge in the majority dispositional coalition; a successful policy proposal thus attracts an endorsing vote (a “join” versus a “concur”) from at least k justices in the majority dispositional coalition. The case disposition and the chosen rule must be consistent in a sense to be made precise shortly, but broadly speaking the disposition must follow logically from application of the rule to

the case in hand. Following the procedure of the U.S. Supreme Court, k corresponds to a bare majority of the *entire* Court regardless of the number of justices in the majority dispositional coalition. So, $k = 5$ on a 9-member court like the U.S. Supreme Court while $k = 2$ on a 3-judge court like a U.S. Court of Appeals. Because the dispositional majority may vary in size from a bare majority of the Court to its entire membership, the k -majority rule for policy-making may be effectively a simple majority rule, a super-majority rule, or a unanimity rule, depending on the size of the dispositional majority.

A. Cases and Opinions

Cases correspond to legally relevant incidents that have transpired. We define the case (or fact) space as the interval $\widehat{X} = [-b, b]$, with $b \geq 1$. An element of this space thus characterizes a situation that has occurred, e.g., the level of care exercised by a manufacturer or the intrusiveness of a search conducted by the police. A legal rule specifies a response of the legal system to transpired incidents, so a legal rule is a function that maps cases into indicated case dispositions, $r : \widehat{X} \longrightarrow \{0, 1\}$. (On an appellate court, the disposition typically affirms or reverses the judgment of a lower court. As a practical matter, the disposition resolves the legal dispute between the litigants – in stylized form, it determines which of the two opposing litigants prevails in the litigation.) We call the application of a rule to a particular case $r(\widehat{x}, x)$; application of the rule yields an indicated disposition $(0, 1)$ of the case \widehat{x} given the content of the rule, indexed as x . Generally, a legal rule partitions a case space into two or more subsets.⁹ We restrict our attention to a subset of all legal rules, those which have two connected sets in the partition. These rules take the form of *standards* or *cut-points*. Thus a legal rule has the form

$$(1) \quad r(\widehat{x}, x) = \begin{cases} 0 & \text{if } \widehat{x} < x \\ 1 & \text{otherwise} \end{cases}$$

Many, though hardly all, legal rules have this general form.¹⁰

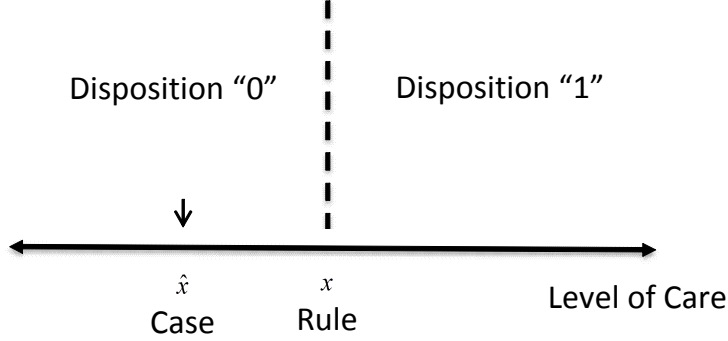


Figure 1: Cases and rules. A case (\hat{x} in the figure) is a transpired event, e.g., the level of care exercised by a manufacturer. A rule partitions the space of cases so that each case is associated with a disposition. When rules have the form of a standard (x in the figure) one can index the rule by the level of the standard. A familiar example is a speed limit such as the 55-mph speed limit.

Figure 1 illustrates a case space and a rule of this form. The labels on the dispositions are arbitrary; for convenience we employ the normalization in Equation 1.

Given that a rule takes the form specified in Equation 1, we can index rules simply by the standard x . Because the standard x is also an element of the fact space, to avoid confusion we refer to elements of the *fact* space with a circumflex, while the rule index is free of the circumflex.

The majority opinion offers a legal rule that yields the majority disposition when applied to the case. Bargaining on the Court concerns the best rule to announce in the opinion. Importantly, any proposed rule must also yield the majority's disposition when applied to the case: it must be *disposition-consistent*. For example, if a majority of the Court finds that "1" is the correct disposition for the instant case \hat{x} , it must be true of any proposed rule x' that $r(\hat{x}, x') = 1$.

Disposition-consistency has an important implication for majority opinions. In particular, the case location \hat{x} partitions the *rule* space X , the set of allowable rules, into two disjoint sub-sets $[-b, \hat{x})$ and $[\hat{x}, b]$. If the judges opt for the "0" disposition then disposition-consistency requires selecting the rule from the second partition; if the judges opt for the "1" disposition they must select the rule from the first partition. In this way, application of the

general rule to the case in hand yields the favored case disposition. Disposition-consistency has important implications for strategic dispositional voting, explained in Section 4 below.

Finally, if the opinion is to have precedential value, it must receive k endorsements (joins) from judges on the Court.

B. Sequence of Play

The sequence of play is shown in Figure 2.

First, Nature selects a case $\hat{x} \in \hat{X}$, the case space. A case automatically partitions the rule space into two partitions, $[-b, \hat{x})$ and $[\hat{x}, b]$.

Second, the justices engage in a pure-majority dispositional vote. As discussed above, the policy effect of the dispositional vote is to select one of the two sub-sets of the rule space in which to set the rule. The dispositional vote also splits the members of the Court into two distinct coalitions, a *dispositional majority* favoring one sub-set of the rule space, and a dispositional minority favoring the other sub-set. (In a unanimous dispositional vote, all members of the Court favor one sub-set over the other.) Formally, let $q^j(\hat{x})$ denote the dispositional vote of block j on case \hat{x} , either 0 or 1. Let the number of votes for disposition "1" be $\#q \equiv Lq^L + Mq^M + Cq^C$. Let $m(\#q)$ be the disposition favored by the majority, so $m(\#q) = 1$ if $\#q \geq k$ and 0 otherwise. Block j is part of the dispositional majority coalition if and only if $q^j(\hat{x}) = m(\#q)$. As shown in Figure 2, the dispositional majority may be composed of one, two, or three blocks. The dispositional majority must produce an opinion whose content is x , an element of the winning interval. (Formally, if $m(\#q) = 0$ then $x \in [\hat{x}, b]$ but if $m(\#q) = 1$ $x \in [-b, \hat{x})$). The selected rule thus rationalizes the majority's disposition, since the disposition of the case follows logically from the application of the rule to the case. Of course, *any* rule from the winning sub-set rationalizes the disposition equally well, so the dispositional vote is *not* a vote between two distinct policies, but rather a vote between two distinct *sets* of possible policies.

Third, one block in the dispositional majority randomly receives the opinion assignment.

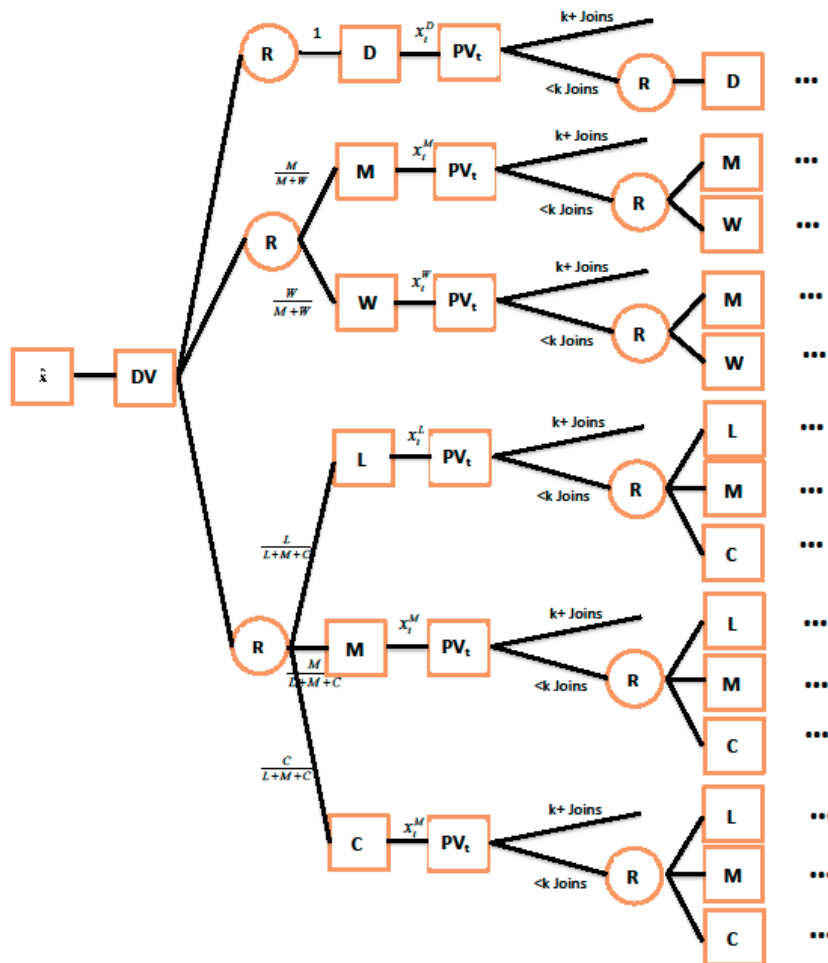


Figure 2: The Judicial Process on a Multi-Member Court. A case \hat{x} arrives. There is a dispositional vote (DV), which induces a dispositional majority. Within the dispositional majority, case assignment to a block is random, with probabilities reflecting relative block size. Opinion assignment yields a proposed opinion rationalizing the disposition, e.g., x_t^D . The blocks in the dispositional majority then vote to endorse the proposed opinion or not (the policy vote, PV). If the proposed opinion garners k or more "joins," the opinion becomes the opinion of the Court. If not, random assignment within the dispositional majority occurs again. The process continues until k members of the dispositional majority join a proposed opinion, which become the opinion of the Court.

That block proposes a policy from the winning sub-set. The assignment probabilities reflect the relative size of the blocks within the dispositional majority and are thus independent of the round of play. E.g., if the majority dispositional coalition is composed of 3 moderate judges and 2 conservative judges, the probability the moderate block receives the assignment is 3/5 while the probability the conservative block receives it is 2/5.

Fourth, the assigned block i drafts and circulates a proposed opinion x_t^i . (We denote the assignee block using superscripts and the round of the proposal using subscripts.)

Fifth, the blocks in the majority dispositional coalition – and those blocks alone – vote on the proposed opinion in a policy vote ("PV" in Figure 2). In effect, a block endorses the proposed opinion by casting a “join” or declines to endorse the opinion by casting a “concur.” Denote a join vote as $w_t^j(x_t^i) \in \{0, 1\}$ where the superscript j denotes the block casting a vote in round t on the proposal made by block i in round t . We let $w_t^j(x_t^i) = 1$ indicate that block j in the dispositional majority has joined the proposed opinion x_t^i by casting its J votes in favor of block i 's proposed opinion. If the proposed opinion receives k or more joins, it becomes the Court's majority opinion and the game ends. Note that k is independent of the size of the majority dispositional coalition so the voting rule requires a different proportion of joins depending on the size of the majority dispositional coalition.

Sixth, if the proposed opinion fails to gain at least k joins, Nature again randomly assigns the opinion among the blocks within the dispositional majority. The game continues until a proposed opinion receives at least k joins and thus becomes the "opinion of the Court." The game may continue infinitely.

We should note the role of the “legal status quo” within the bargaining game, as this point has engendered some controversy among judicial scholars. Although there is a prior legal policy, this policy effectively reverts to a null policy when the Court takes the case – policy is in limbo until the Court resolves the case. In fact, the only way for policy to revert to the status quo ante is for the Court to re-enact it anew in the majority opinion. So, the players do not receive a “status quo” payoff during rounds of bargaining, but rather zero

each round there is no agreement on a new policy (see "Utilities" below). We finesse the issue of whether the Court would ever take another case in a policy area, that is, whether the announced policy is actually time-consistent and renegotiation-proof. In effect, we assume the Court commits to its announced policy, but we do not study the commitment mechanism. None of the current models of collegial courts address the time-consistency of the bargaining outcome (but note Rasmusen). Recent legislative models of sequential policy making with evolving status quos determined by earlier rounds of policy-making are suggestive (Baron 1996, Kalandrakis 2010) but we do not pursue this point any farther in this paper.

C. Utilities

Following Carrubba et al and MCC3, we distinguish the utility received from casting dispositional votes from the utility derived from the content of majority opinions.¹¹

We first define per-period utilities over opinions. We assume each block j has an ideal point \bar{x}^j , its most-preferred standard for the rule. In addition we normalize $u^j(\bar{x}^j) = 1$ and require $u^j(x) \geq 0$ for all $x \in [-b, b]$ so that future utility may be discounted appropriately. More concretely, we assume triangular utility functions and ideal points $\bar{x}^L = -1$, $\bar{x}^M = 0$, and $\bar{x}^C = 1$.¹² The utility of block j from policy x_i^m proposed by block m in round i is thus:

$$u_i^L(x_i^m) = \begin{cases} \max\{1 - \frac{1}{2}|-1 - x_i^m|, 0\} & \text{if } k \text{ or more justices join the opinion} \\ 0 & \text{otherwise} \end{cases}$$

$$u_i^M(x_i^m) = \begin{cases} \max\{1 - \frac{1}{2}|0 - x_i^m|, 0\} & \text{if } k \text{ or more justices join the opinion} \\ 0 & \text{otherwise} \end{cases}$$

$$u_i^C(x_i^m) = \begin{cases} \max\{1 - \frac{1}{2}|1 - x_i^m|, 0\} & \text{if } k \text{ or more justices join the opinion} \\ 0 & \text{otherwise} \end{cases}$$

In words, if the proposal in round i fails to garner k or more joins, all the judges receive

a value of 0 in that round. If the proposal does gain k or more joins, the policy is enacted and valued according to the distance of the proposal from a block's "ideal policy." The ideal policy of the Liberal block is -1 , that of the Moderate block is 0, and that of the Conservative block is 1. For each block, the value of receiving its ideal policy is "1," and utility declines at a marginal rate of $\frac{1}{2}$ as distance from the ideal policy increases up to a distance of 2, after which utility is uniformly 0. Per-period utilities extend straightforwardly to expected utilities.

Importantly, policies received in future rounds are discounted with common discount rate $\delta \in [0, 1]$. For example, at round i , the value of receiving one's ideal policy in round $i + 1$ is δ . Substantively, δ indicates the impatience of the justices or the toughness of the bargaining. It is useful to think of δ as an attribute of a case, e.g., its *importance*, so that high δ (near 1) corresponds to an important case engendering patient justices and tough bargaining, while a low δ (near 0) indicates a more routine case, impatient justices, and rather desultory bargaining.

We may now define the *dispositional utility* $d^j(q^j; \hat{x})$ of block j . Suppose the court must dispose of case \hat{x} . Recall that block j 's dispositional vote is q^j and the treatment of a case indicated by a legal rule x is $r(\hat{x}, x)$. If block j could unilaterally set policy, it would set it to \bar{x}^j , and the treatment of case \hat{x} using this rule would be $r(\hat{x}, \bar{x}^j)$. Block j 's dispositional utility from its dispositional vote is:

$$d^j(q^j; \hat{x}) = \begin{cases} D & \text{if } q^j = r(\hat{x}, \bar{x}^j) \\ 0 & \text{if } q^j \neq r(\hat{x}, \bar{x}^j) \end{cases}$$

In words, a block receives a gain from casting a "sincere" dispositional vote; it does not receive this gain if it casts an insincere or "strategic" dispositional vote. Note that dispositional utility arises from voting the "correct" way; it is independent of the Court's actual disposition of the case, given by $m(\#q)$. Hence, switching from one dispositional vote to another necessarily brings a change in utility even if one's dispositional vote is not pivotal

in Court's disposition of the case.

D. Strategies and Continuation Values

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Because this is a potentially infinite horizon bargaining game, strategies can be quite complex as they may reflect the entire history of the game up to the current round. A history h_t of the game up to time t is, first, an indication of the composition of the dispositional majority coalition and then a specification of which block received the opinion assignment in all previous rounds, the offer made by the block with the assignment in those rounds, and the join votes following each offer in those rounds. A pure strategy s_t^i at time t in the bargaining component of the game is a prescription of what offer to make given receipt of the assignment and how to vote on any offer made by any offerer. So if H_t is the set of possible histories, a pure strategy $s_t^i : H_t \rightarrow X$ is a map if t is the beginning of the round and block i is recognized, and is $s_t^i : H_t \rightarrow \{join, concur\}$ if t is an opportunity to vote on a proposal. A strategy s^i of block i is a sequence of functions s_t^i mapping H_t into the block's available actions at time t (that is, either a vote or a proposal and a vote). Whenever a member is to take an action, he or she knows which history has occurred, so the game is one of perfect information.

We require equilibria to be sub-game perfect. An equilibrium configuration of strategies is sub-game perfect if the restriction of those strategies to any subgame constitutes a Nash equilibrium in that subgame.

In games with three blocks we further require strategies to be stationary, that is, we require players to use the same strategies in structurally equivalent sub-games irrespective of the history of the game. This precludes complex nested punishment strategies; rather, stationary strategies are chosen in response only to the incentives presented to the blocks by the play in future rounds. Two sub-games are structurally equivalent if the members who can be recognized in each round, and their recognition probabilities, are the same, and if the

strategy sets of the blocks are the same. It will be seen that the beginning of each round of bargaining is structurally equivalent.

The value and continuation value of sub-games play an important role in the analysis. For any particular sub-game perfect equilibrium, the *value* $v_t(g)$ of sub-game g after t rounds of bargaining is defined as the vector of values $v_t^i(g)$ (where i denotes the block (l, m, c)) to the blocks that results from the play of that sub-game perfect equilibrium strategy profile. The *continuation value* of the game $\delta v_t^i(g)$ to block i is the "time discounted" value if the Court moves to sub-game g . More precisely, $\delta v_t^i(g)$ represents block i 's reservation rule in the negotiation. Any rule must yield block i at least that amount. An equilibrium is stationary if the continuation values for each structurally equivalent subgame are the same.

III. Bargaining over Policy within the Dispositional Majority

We consider equilibria and the comparative statics of offers in the subgames induced by the dispositional vote. In terms of Figure 2 we analyze play in the top, middle, and bottom tiers of the figure following "DV." For clarity and ease of exposition we focus on bargaining following sincere dispositional voting; we discuss the impact of strategic voting over dispositions in Section IV.

A. Constructing Equilibria

In the infinite horizon sequential bargaining game, players evaluate offers by comparing the value of the current "bird in the hand" with that of the future "bird in the bush," that is, they compare the value of the offer circulated by the current assignee with the expected value from the offers and votes that will follow if the current offer fails to receive five join votes. The latter creates a reservation value for each judge, against which they weigh current offers. In calculating this reservation value, the judges take into account the likelihood of future offers from each of the ideological blocks as well as equilibrium voting strategies. Because the opinion assignment probabilities for blocks are proportional to the relative block sizes,

the assignment probabilities do not depend on the round of play. Delay in reaching an agreement is costly due to the discount or toughness factor δ , so the value of the same offer accepted earlier is greater than that of same offer accepted later (except when $\delta = 1$ or the value of an offer is 0). Thus, each assignee has an incentive to immediately make the offer she finds most attractive from among those that five or more judges in the majority dispositional coalition would be willing to join. When the dispositional majority is composed of two blocks, these facts allow calculation of equilibrium offers using subgame perfection. When the dispositional majority is composed of three blocks and the offering and voting strategies of the players depend only on the current offer and not on the history of the game, equilibrium offers and voting strategies can be calculated in a very similar fashion.

Example.—A simple example may be helpful. Consider a unanimous disposition on the three judge court (1,1,1) composed of one liberal, one moderate, and one conservative judge, a "trilateral balanced" configuration in the dispositional majority. Such a disposition would be induced by a case located at a point less than -1 or greater than 1, given sincere dispositional voting. What constitute equilibrium offers for proposed majority opinion and voting strategies within the dispositional majority (joins versus concurs)?

An obvious equilibrium occurs at very low δ so players who are "soft" bargainers heavily discount the value of future offers – e.g., the case is relatively unimportant. In this equilibrium, a "wing" judge (the liberal or conservative judge) offers his most-preferred policy if he receives the opinion assignment, and the moderate judge accepts such an offer thereby ending the game. And, the moderate judge does the same thing: she offers her most-preferred policy, and both of the wing judges accept this offer. In this equilibrium, for the conservative judge the continuation value of the game following a rejected offer is

$$\begin{aligned}
 & \delta \left(\frac{1}{3} \left(1 - \frac{1}{2} |1 - (-1)| \right) + \frac{1}{3} \left(1 - \frac{1}{2} |1 - 0| \right) + \frac{1}{3} \left(1 - \frac{1}{2} |1 - 1| \right) \right) \\
 = & \delta \left(\frac{1}{3} 0 + \frac{1}{3} \frac{1}{2} + \frac{1}{3} 1 \right) \\
 = & \frac{1}{2} \delta
 \end{aligned}$$

and (via similar calculations) $\frac{1}{2}\delta$ for the liberal judge and $\frac{2}{3}\delta$ for the moderate judge. (Note the implicit use of the equilibrium offering and voting strategies, which imply that the game will end in the next period should it be reached.) For the moderate judge, the value of the specified offer from the conservative judge is $1 - \frac{1}{2}|0 - 1| = \frac{1}{2}$. The moderate judge will be willing to accept this offer from the conservative judge if and only if $\frac{1}{2} \geq \frac{2}{3}\delta$, that is, if $\delta \leq \frac{3}{4}$. A simple calculation shows that the liberal and conservative judges will follow the prescribed strategies for all $\delta \leq 1$ so the moderate's willingness to accept wing offers is the critical constraint. Because a majority is willing to accommodate opinions that offer the author's ideal point, we call this an "accommodating" equilibrium.

Suppose $\delta > \frac{3}{4}$, so the judges are tougher bargainers and the accommodating equilibrium breaks down. This could occur, for instance, in deciding policy in a more important case. What happens then? An obvious candidate equilibrium has the liberal and conservative judges make compromise offers in order to secure a join from the moderate judge, but the moderate judge offers his most-preferred policy which the two wings then join. In this equilibrium L 's offer must satisfy (using M 's utility function)

$$1 - \frac{1}{2}|0 - x^L| \geq \delta \left(\frac{1}{3} \left(1 - \frac{1}{2}|0 - x^L| \right) + \frac{1}{3}(1) + \frac{1}{3} \left(1 - \frac{1}{2}|0 - x^C| \right) \right)$$

and similarly C 's offer must satisfy

$$1 - \frac{1}{2}|0 - x^C| \geq \delta \left(\frac{1}{3} \left(1 - \frac{1}{2}|0 - x^L| \right) + \frac{1}{3}(1) + \frac{1}{3} \left(1 - \frac{1}{2}|0 - x^C| \right) \right)$$

Solving both equations simultaneously yields $x^L = -\frac{6(1-\delta)}{3-2\delta}$ and $x^C = \frac{6(1-\delta)}{3-2\delta}$. It is straightforward to show that L and M will indeed join $x^M = 0$, and neither joins the other wing's offer. In addition, it is easy to show that no other candidate equilibrium (such as, only one wing compromises, or one wing and M compromises) can be an equilibrium. Hence, we have characterized equilibrium offers and voting strategies for all values of δ in the (1,1,1) court with a unanimous disposition (under sincere dispositional voting). Equilibria

in the other dispositional majority coalitions can be constructed in a similar way.

In fact, constructing equilibria in the other 3-judge cases, or for a 9-judge court, or indeed for a court of any size, is no more difficult and generally easier. For example, one need solve simultaneous equations only for unanimous dispositions.¹³ However, there are several strategically distinct cases to consider.

B. Cases

Given three ideological blocks, there are seven possible configurations of majority dispositional coalitions: $\{L\}$, $\{M\}$, $\{C\}$, $\{L,M\}$, $\{M,C\}$, $\{L,C\}$, and $\{L,M,C\}$. Of course, some of these possible majorities are infeasible on some courts, for instance, only the $\{L,M\}$, $\{M,C\}$, and $\{L,M,C\}$ majority coalitions are actually possible in a (3,3,3) court with sincere dispositional voting: the $\{L\}$, $\{M\}$, and $\{C\}$ majorities cannot occur since the relevant blocks number less than $k = 5$, while the $\{L,C\}$ majority cannot occur with sincere dispositional voting. Similarly, in a (7,0,2) court, only the $\{L\}$ and $\{L,C\}$ majority coalitions are possible. Still, it would seem that one might need to calculate equilibria for many majority dispositional coalitions as the number of judges increases. Fortunately, the number of *strategically distinct* majority coalitions is much smaller, so that it becomes feasible to fully characterize equilibrium offers and voting.

In fact, majority dispositional coalitions fall into five distinct strategic groups:

1. *Unilateral Coalitions.* The first (and somewhat trivial) group is "unilateral" majorities composed of a single majority block that contains k or more justices. An example is the $\{C\}$ majority coalition on the (4,0,5) nine-judge court. In a unilateral majority coalition, the block proposes its ideal policy, joins it, and ends the game. There are three possible unilateral coalitions: $\{L\}$, $\{M\}$, and $\{C\}$.
2. *Bilateral Dominant Coalitions.* The second group is "bilateral dominant" majorities, in which the majority dispositional coalition is comprised of two blocks, one of which

contains k or more judges and other does not. Examples are the $\{M,C\}$ coalition on the $\{0,1,2\}$ three-judge court and the unanimous coalition in the $\{4,0,5\}$ nine-judge court. In a bilateral dominant dispositional coalition, when the dominant block receives the assignment, it proposes its ideal opinion, joins it, and ends the game. If the subordinate block receives the assignment it may have to offer a compromise opinion in order to secure joins from the dominant block. There are six possible bilateral dominant coalitions: $\{M,C\}$, M dominant; $\{M,C\}$, C dominant; $\{L,M\}$, L dominant; $\{L,M\}$, M dominant; $\{L,C\}$, L dominant; and $\{L,C\}$, C dominant.

3. *Bilateral Balanced Coalitions.* The third group is “bilateral balanced” majorities in which two blocks comprise the majority dispositional coalition, but neither block contains k or more judges. Examples are the $\{M,C\}$ coalition on the three-judge (1,1,1) court, and the $\{L,M\}$ and $\{M,C\}$ coalitions on the nine-judge (4,1,4) court. As explained shortly, blocks in a bilateral dominance coalition may be able to impose their ideal opinion on the Court, but also may be forced to offer a compromise opinion depending on the value of δ , the location of the proposer, and the block sizes. There are six distinct types of bilateral balanced coalitions: $\{M,C\}$, $M > C$; $\{M,C\}$, $C > M$, $\{M,C\}$, $M = C$; $\{L,M\}$, $L > M$; $\{L,M\}$, $M > C$; $\{L,M\}$, $L = M$; and $\{L,C\}$, $L=C$. With sincere dispositional voting, the latter can occur only on a court with an even number of judges and no moderates – with an odd number of judges, one of the blocks must number at least k .

4. *Trilateral Dominant Coalitions.* The fourth group is “trilateral dominant” majorities. Here, all three blocks are in the majority dispositional coalition but one of the blocks has k or more members. This type of majority coalition cannot occur on a three-judge court but an example on a nine-judge court is the unanimous disposition in the (2,2,5) court. As in the bilateral dominant case, the dominant block can enact its most preferred policy and end the game, should it receive the opinion assignment; the

other blocks may have to offer compromise policies to secure the votes of the dominant block. There are three trilateral dominant coalitions: $\{L,M,C\}$, L dominant; $\{L,M,C\}$, M dominant; and $\{L,M,C\}$, C dominant.

5. *Trilateral Balanced Coalitions.* Fifth, and finally, are "trilateral balanced" majorities in which all three blocks are in the majority dispositional coalition but no single block has k or more justices. Above we considered the equilibrium in the unanimous disposition on a (1,1,1) three-judge court. Examples of trilateral balanced coalitions on nine-judge courts are the unanimous dispositions $\{3,3,3\}$ and $\{4,4,1\}$. There is only one such coalition: $\{L,M,C\}$

Table 1 indicates equilibrium offers in the five strategic groups, including the sub-cases within each. Hence, there are 20 rows in the table. The table indicates the offer made by each block that could make an offer in the indicated majority. It will be seen that there are 41 cells in the table with indicated offers from a block in the dispositional majority. The formulae characterize the content of majority opinions for courts with any number of judges in three ideological blocks, conditional on the specific dispositional coalition. and the opinion assignment.

C. Realized Majority Opinions

Opinion content in the sequential bargaining model displays several notable patterns:

- Unless $\delta = 1$ (that is, unless bargaining is extraordinarily tough) or the majority is composed of a single block, bargaining yields a *distribution* of realized majority opinions rather than a single opinion proffered by all judges irrespective of their preferences.
- The location and frequency of the proffered opinions reflects the preferences of the opinion author, the value of δ (the bargaining toughness induced by, e.g., case importance), and the respective block sizes in the majority dispositional coalition.

- Dominant blocks in the majority – blocks that contain at least k members – always offer their most-preferred policy.
- Sufficiently low δ leads to an "accommodating" equilibrium: the opinion author proposes a majority opinion containing her ideal policy, which a majority of judges on the Court then accommodates by joining the opinion. Accommodating equilibria exist even though the game itself allows intense competition over the content of the opinion and no "status quo" policy affords leverage for a take-it-or-leave-it offer. Rather, accommodation reflects the unwillingness of the judges to engage in protracted haggling over a relatively unimportant case.
- Higher values of δ lead to "compromising" equilibria in which non-dominant blocks circulate a compromise opinion aimed at securing joins from an adjacent block, a block that would concur absent the compromise. However, in unanimous dispositions the moderate block remains able to offer its ideal policy, because each wing joins the moderate block's offer in order to preclude a future offer from the opposing wing.
- In a compromising equilibrium, offers in bilateral majority coalitions are responsive to block sizes in a natural way: a non-dominant block's offers get tougher as its relative size increases, and become more accommodating as its relative size decreases.
- In a compromising equilibrium, wing offers in a balanced trilateral majority (unanimous) coalition reflect the block size only of the moderate block, not that of the wings; in a dominant trilateral majority coalition, offers from non-dominant blocks reflect the block size only of the dominant block. This seemingly strange feature reflects the pivotal nature of the key block in these configurations.

In addition:

- Agreement is immediate.

- Voting coalitions ("join coalitions") in the dispositional majority may be unanimous or minimum winning, depending on the configuration in the majority coalition and the value of δ .

Effect of δ (Bargaining Toughness).—To illustrate the effect of changing δ , the bargaining toughness parameter, we examine the distribution of offers in a single court, the (2,4,3) nine-judge court. Recall that δ increases with greater case importance, lower case loads, and more resources. The predicted realized offers in the (2,4,3) court are shown in Figure 3.

The figure shows the distribution of offers at six levels of delta (0, .6, .7, .8, .9, 1) for each of the three majority coalitions that are possible on this Court, given sincere dispositional voting. The coalitions are: the {L,M} coalition induced by sincere dispositional voting when the case lies between 0 and 1, the {M,C} coalition induced by sincere dispositional voting when the case between -1 and 0, and the unanimous coalition {LM,C} induced by a sincere dispositional voting when the case lies below -1 or above 1.). The first two are bilateral balanced coalitions, the third is a trilateral balanced coalition. Each column in the figure corresponds to one of the majority coalitions; each row to one of the values of δ .

Except at $\delta = 1$, when bargaining is extraordinarily tough, the sequential bargaining model predicts a distribution of distinct offers in each majority coalition. The distribution reflects the fact that ideologically different authors pen ideologically distinct offers that are nonetheless acceptable to a majority on the Court. Thus, in the unanimous disposition, there are three distinct offers because each of the three blocks makes somewhat different offers. The frequency of the offers reflects the respective sizes of the ideological blocks. However, as δ increases and bargaining becomes ever tougher, the location of the distinct offers shift. In bilateral majorities, the offers of the smaller block converges to that of the largest block. However, note the pattern of convergence when the majority is composed of two blocks of nearly equal size (the MC majority). In that situation, the larger block must also compromise at high values of δ (very tough bargaining) because it still requires join

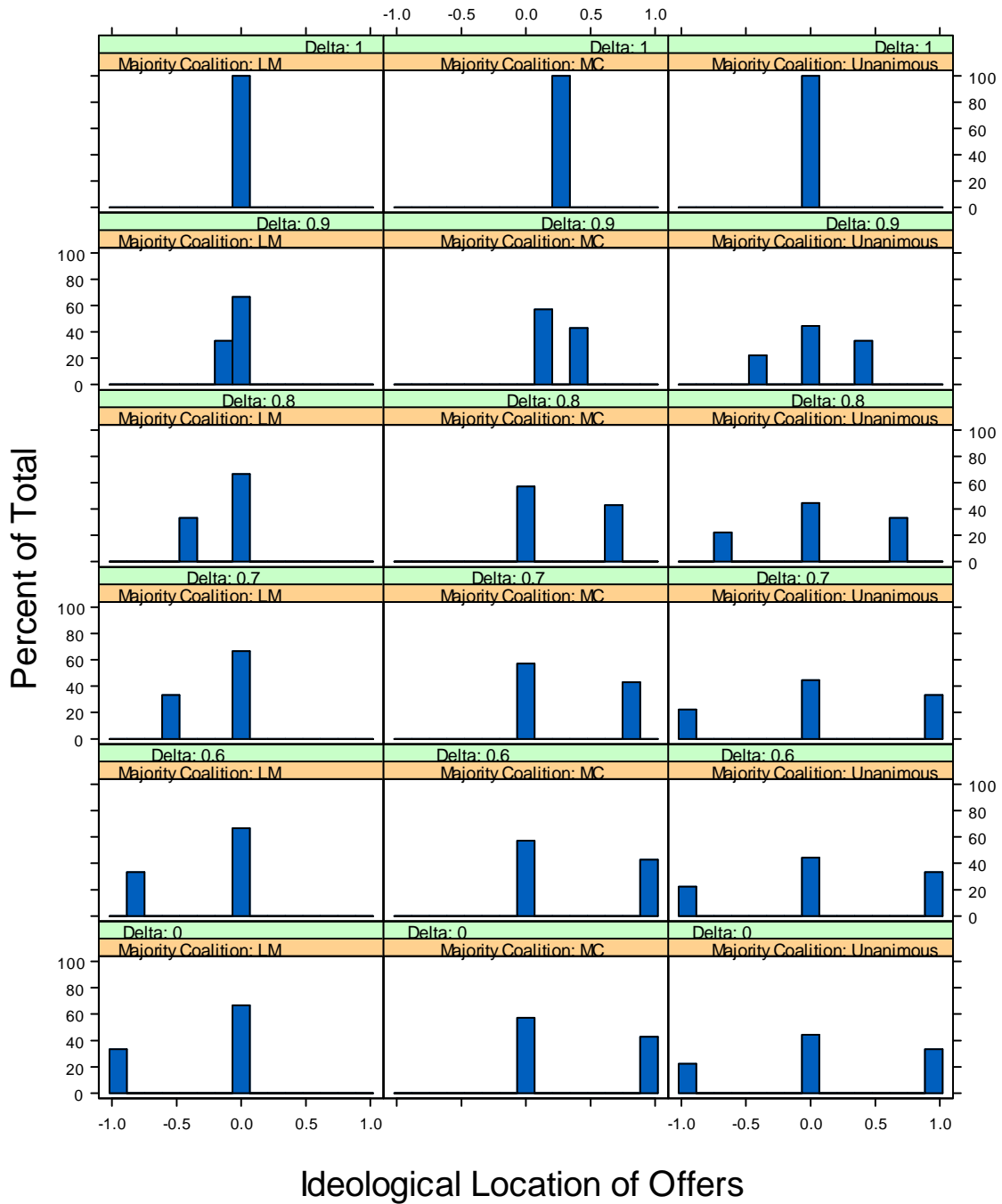


Figure 3: The Distribution of Offers in the (2,4,3) Court.

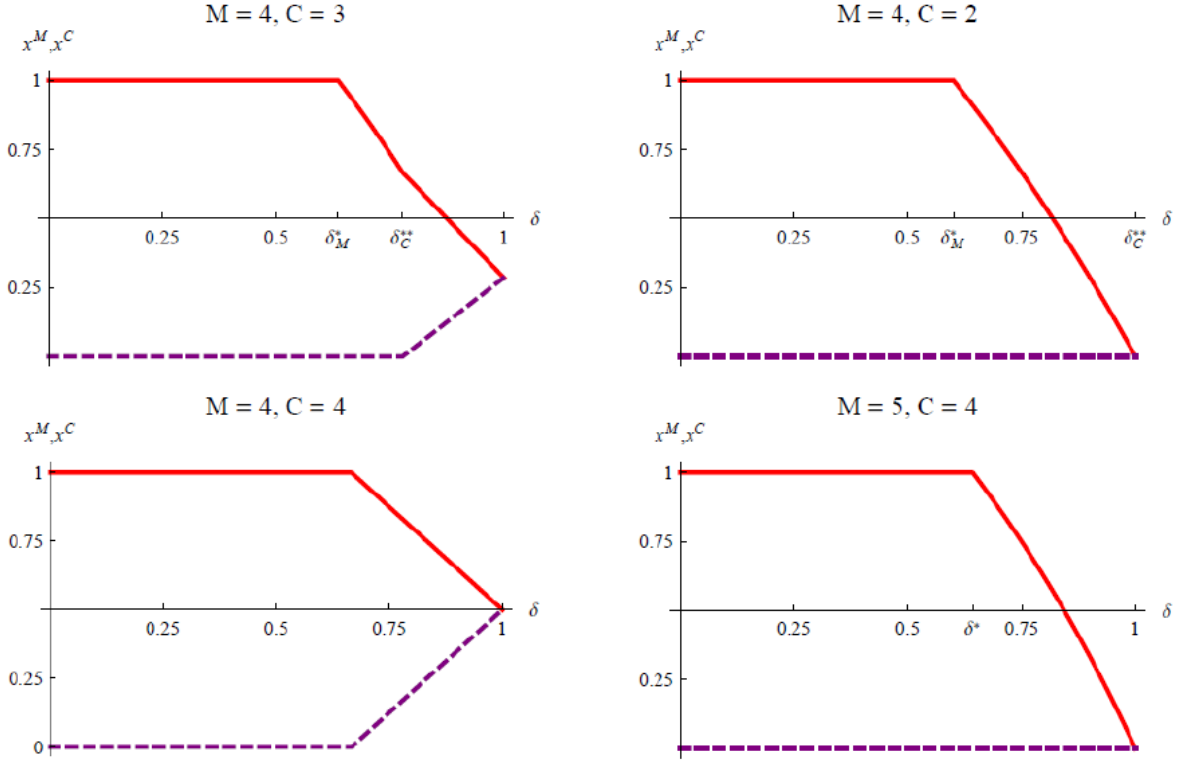


Figure 4: The Effect of Block Size on Offers. Opinions offered by the Conservative block are shown with a solid line, those from the Moderate block with a dashed line.

votes from the smaller block. In the unanimous coalition, the wings offer compromises to the moderate block, seeking its joins. However, the moderate block need not offer compromises to either of the two wings because an offer even at its ideal point is so much more attractive to a wing than the prospect of an offer from the opposing wing. At $\delta = 1$, when bargaining is bruisingly tough, the distribution of offers collapses to a single value in the interior of the space spanned by the blocks in the dispositional coalition.

Effect of Block Size.—Altering the relative sizes of the blocks within the dispositional majority can have a dramatic impact on the opinions offered. First, changes in block size can alter the strategic context, e.g., changing a bilateral balanced configuration into a bilateral dominant configuration. But even within the same strategic context, a change in the relative block sizes alters the recognition probabilities of the blocks and thus changes the continuation value of the game for the players. As a result, their offers change.

Figure 4 illustrates the changes in offers as relative block sizes vary.¹⁴ In the figure, the dispositional majority is always composed of the Moderate and Conservative blocks. Each panel indicates the locations of offers on the y -axis for any value of δ , shown on the x -axis. First consider the lower left-hand panel in which the size of the two blocks are same (4 and 4). Below $\delta = \frac{2}{3}$, judges in both blocks offer their ideal policy (the accommodating equilibrium). At higher values of the toughness parameter, however, they both offer compromise opinions which converge smoothly and symmetrically to $\frac{1}{2}$ at $\delta = 1$, that is, mid-way between the two blocks.

The upper left-hand panels indicates what happens when the Moderate block remains at four but the Conservative block shrinks to just three members. The smaller Conservative block begins to make compromise offers at a slightly lower toughness level (at $\delta_G^* = \frac{7}{11}$) but the Moderate block offers no compromises until δ reaches $\delta_S^{**} = \frac{7}{9}$ (the two critical values of δ are define in Proposition 6). Above that value of δ , both blocks proffer compromise opinions when they receive the assignment. As bargaining becomes tougher and tougher, the two compromise offers converge to $\frac{2}{7}$ rather than one-half, that is, closer to the Moderate block's most preferred policy. (Note that the converge point does not correspond to the ideal point of the median member of the dispositional majority, a point we return to below).

In the upper right-hand panel, the Conservative block is yet smaller, numbering but two. The small Conservative block begins to offer compromises at $\delta_G^* = \frac{3}{5}$ but the Moderate block never offers a compromise even though it is not a dominant block and must still attract joins from the conservatives ($\delta_S^{**} = 1$). The Moderate block can behave in such a tough manner because the likelihood of it receiving the assignment in the future is so large that the Moderate block essentially capitulates. The Moderate block's disproportionate size allows it to over-power the puny Conservative block.

Finally, in the lower-right hand panel, the Moderate block numbers five while the Conservative block numbers four. The block sizes in this panel are almost the same as those in the lower left-hand panel. But the contrast between the panels is dramatic: the addition of a

single member to the Moderate block allows it to become a dominant block. This transforms its strategic position so that it never has to compromise with the other block. The Conservative block, while almost as large as the Moderate block, begins compromising at $\delta^* = \frac{9}{14}$, almost the same critical value as that governing the over-powered Conservative block in the upper right-hand panel. Though the offering behaviors in the two right-hand panels are very similar, the mechanisms behind them are distinct: a substantial size advantage resulting in favorable assignment probabilities in the top panel, versus a strategic advantage conferred by the k -majority voting rule in the lower panel.

D. Expected Policy Outcomes Across Courts

The distribution of realized opinion locations is key for understanding the operation of appellate courts. But the "average" content of opinions is also important. First, it is essential to calculate these values for an analysis of sophisticated dispositional voting. This is because a judge contemplating a sophisticated vote must be able to compare the expected value of opinions with him in and out of the dispositional majority. Second expected opinion content provides a useful summary measure of the central ideological tendency of a given Court. One can compare this central tendency across courts as their ideological make-up varies. Expected majority opinion content would appear central in evaluating the policy impact of a Supreme Court nominee, for example. Using the formulae for realized majority opinions in Table 1 and the block recognition probabilities, it is straightforward to calculate expected majority opinion content for any court (L,M,C) conditional on the majority dispositional majority and the bargaining toughness parameter δ . These expected values are also shown in Table 1

The U.S. Supreme Court.—We illustrate expected policy outcomes in the 9-member appellate courts, such as the U.S. Supreme Court.

From combinatorics, n judges may be allocated over three ideological blocks in $\binom{n+2}{n} = \frac{(n+2)!}{n!(2)} = \frac{(n+1)(n+2)}{2}$ ways. So, a court with three members has 10 distinct ideological varieties,

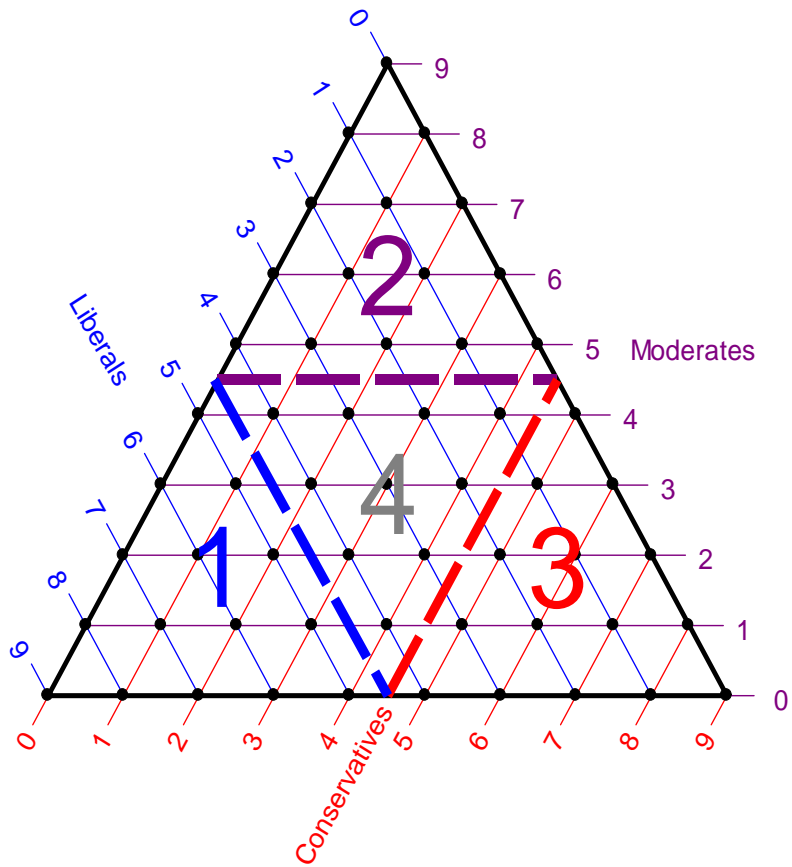


Figure 5: Ternary Graph of the 9-Member Courts. Shown as black dots are the 55 possible 9-member courts (L,M,C) (e.g., (2,4,3)). The guidelines allow the easy location of any such court. Courts in Region 1 have a dominant Liberal block, those in Region 2 have dominant Moderate block, those in Region 3 have a dominant conservative block, and those in Region 4 have no dominant block.

while a court with nine members has 55 ideological varieties (e.g., (9,0,0), (3,3,3) and so on). A convenient way to portray these 55 courts is a ternary graph, displaying the simplex of (L,M,C) courts where $L + M + C = 9$. This basic ternary graph is shown in Figure 5. Explain the figure including the four regions.

First consider the column corresponding a unanimous disposition. The effect of a dominant block in the majority coalition becomes increasingly prominent as bargaining moves from 'soft" ($\delta = 0$) to bruisingly tough ($\delta = 1$).

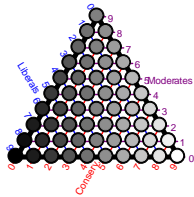
E. Comparison with Alternative Models

The sequential bargaining (SB) model embeds within it (or very nearly so) three prominent alternative models of decision-making on appellate courts. These models can thus be seen as special cases corresponding to particular parameter values. Alternatively, the SB model provides an explicit non-cooperative bargaining foundation for the other models, albeit as special cases.

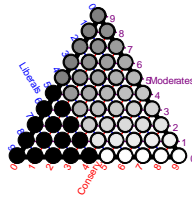
Median Judge Model.—The median judge (MJ) model is distinguished by two predictions. First, it predicts a single offer from the Court, not a distribution of offers. Second, it predicts that this offer is always and only located at the ideal policy of the median judge on the Court. As immediate corollaries, the MJ model implies that majority opinions are unresponsive to the location of the case, unresponsive to the make-up of the majority dispositional coalition, unresponsive to the identity of the opinion author, unresponsive to other attributes of the case such as importance, and unresponsive to other attributes of the Court such as case load and resource availability.

These rather remarkable predictions emerge as a special case in the SB model: a unanimous disposition induced by sincere voting coupled with extraordinarily tough bargaining ($\delta = 1$). In that special circumstance, the distribution of offers in the SB model collapses to a single offer, and that offer corresponds to the ideal point of the block containing the median judge on the Court. Because at $\delta = 1$ there is only one offer irrespective of the

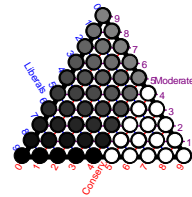
Unanimous, $\delta=0$



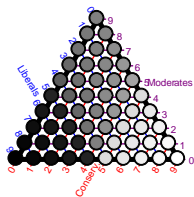
L vs MC, $\delta=0$



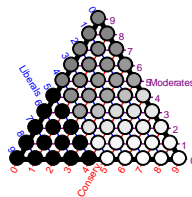
LM vs C, $\delta=0$



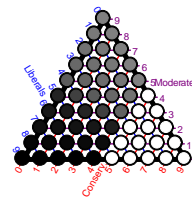
$\delta=.8$



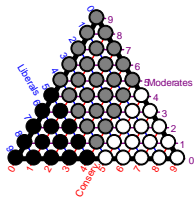
$\delta=.8$



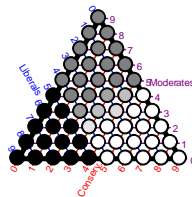
$\delta=.8$



$\delta=1$



$\delta=1$



$\delta=1$

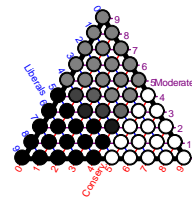


Figure 6: Expected Policy in the 9-Member Courts. Each circle in a ternary graph represents one of the 55 possible 9-member courts. The shading of a circle indicates expected policy in that court given the indicated dispositional coalition and value of delta. Darker shading corresponds to more liberal policy, lighter shading to more conservative policy. Each column corresponds to a particular dispositional coalition (L vs MC, LM vs C, and unanimous) ; each row to distinct value of delta (0, .8, and 1).

opinion assignee, realized offers and expected offers are the same. Thus, the lower left-hand panel in Figure 6 displays not just the expected policies but the realized majority opinions for every 9-judge court with three ideological blocks, and these predictions are exactly the same under the MV model. Of course, the SB and MV models diverge very sharply in their predictions for all other parameters, as suggested by the figure.

Monopoly Author Model.—The monopoly author (MA) model predicts that the location of the majority opinion in a case corresponds to the ideal policy of the opinion author. The original formulations of the MA model were silent about opinion assignment. And, since the model was essentially legislative, case location played no role. A "friendly amendment" to the MA model might restrict opinion assignment to members of the dispositional majority, since (after all) dissenters are not allowed to pen the majority opinion. A second natural extension would allow opinion assignment in the majority to be identical over the members of the court, resulting in assignment probabilities to ideological blocks proportional to block size.

With these modifications, the predictions of the MA model emerge as an important case in the SB model, namely, when the bargaining toughness parameter δ is sufficiently low that the "accommodating equilibrium" emerges. In this case, both realized opinions and expected policy are the same in the two models. Hence, the top row in figure 6 indicates expected policy in both the SB and MA models. However, both realized opinions and expected policy in the two models diverge sharply at higher levels of δ .

It is worth noting that even when the predictions of the MA and SB models coincide, the mechanisms behind the predictions are quite different. The MA model envisions a monopoly agenda setter who faces no opinion competition whatever, and who can leverage his opinion against a "status quo" policy via a single take-it-or-leave-it offer. In contrast, the SB model portrays a situation in which the judges' reservation values are very low, because (for instance) the case is relatively unimportant or they have few resources to devote to it. The assigned opinion author can then exploit the other judges' eagerness to strike a deal

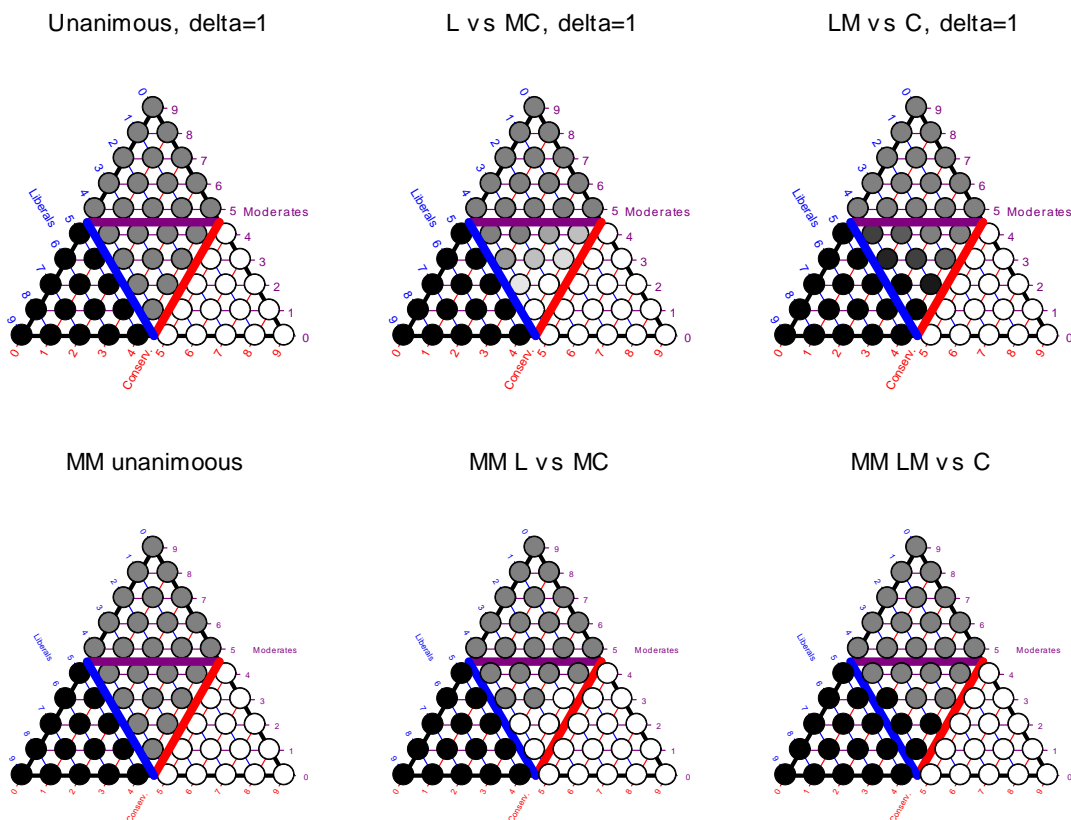


Figure 7: Opinion Locations in the Majority Median and Sequential Bargaining Models When $\Delta = 1$. The predictions of the two models coincide in the unanimous disposition and in courts with dominant blocks (Regions 1-3 in the ternary graphs). Predicted locations vary slightly in non-unanimous dispositions in most courts without a dominant block (Region 4 in the ternary graphs).

and gain acceptance of a very favorable opinion.

Majority Median Model.—The majority median voter (MM) model is distinguished by three predictions. First, it predicts a single offer from the Court, not a distribution of offers, once one controls for the make-up of the majority dispositional coalition. Second, it predicts that this offer varies with the make-up of the majority dispositional coalition. Third, it predicts that the location of the opinion from a given dispositional majority is located exactly at, and only at, the ideal point of the median judge in the majority dispositional coalition. As a corollary, it predicts that opinion location is insensitive to opinion assignment

within a given dispositional majority. The current version of the model assumes sincere dispositional voting.

The bottom row in Figure 7 displays the MM model's predicted opinions (both realized and expected, since they coincide) for all courts with nine members distributed over three ideological blocks. The left-hand panel assumes a unanimous disposition, the middle panel a disposition that pits L against MC, and the right-hand panel a disposition that pits LM against C. In courts with a dominant block (Regions 1-3), the MM model predicts a majority opinion located exactly at the ideal point of the dominant block. In courts without a dominant block (Region 4), the model predicts policies at the ideal point of the moderate block if there is a unanimous disposition; at the ideal point of either the moderate block or the liberal block if the disposition pits the L block against the MC blocks; and at the ideal point of either the moderate block or the conservative block if the case disposition pits the LM blocks against the C block.

When $\delta < 1$, the SB model and the MM model typically make distinct predictions, even under sincere voting. Notably, the SB model predicts a *distribution* of realized opinions, not just one, even controlling for the make-up of the majority dispositional coalition. When δ is low, the SB model predicts that opinion assignment affects the location of realized opinions. When $\delta < 1$, the expected values of opinions in the two models often differ somewhat (though perhaps not enough to be detectable in any realistic empirical test).

When $\delta = 1$, however, the predictions of the two models coincide almost perfectly. The top row of Figure 7 indicates predicted opinion locations (both realized and expected, since opinions collapse to a single value) for all courts with nine members distributed over three ideological blocks. Thus, a comparison of the top and bottom panels in each column affords a comparison of the models' predictions in all 55 possible courts. It will be seen that the models' predictions for unanimous dispositions are identical. In the non-unanimous dispositions, the predictions for courts with a dominant block (that is, in Regions 1-3) are also identical, though this is hardly surprising. In courts without a dominant block (courts in the

central Region 4 in the middle and right-hand columns), the predictions of the two models track one another very closely, though the SB model sometimes makes a more "muted" prediction than the stark $-1, 0, 1$ predictions of the MM model. But these differences in bilateral balanced bargaining tend to be small.

In short, the predictions of the two models are quite distinct when $\delta < 1$, but at $\delta = 1$ the predictions are almost identical. Hence, the MM model again emerges as a special case of the SB model.

IV. Dispositional Voting (Incomplete)

We now consider dispositional voting, which occurs before the bargaining within the dispositional majority (see Figure 2). We begin with some terminology. By "utility maximizing voting," we meant that the block votes on the disposition to maximize its utility, correctly anticipating the effect of its dispositional vote on the choice of rule. By "sincere voting" we mean that the block votes strictly in accord with its most preferred rule, without considering the effects of this dispositional vote on the composition of the dispositional majority and hence the content of the opinion. Using the notation defined earlier, sincere voting by block j corresponds to $q^j = r(\hat{x}, \bar{x}^j)$. Sincere dispositional voting may sometimes be compatible with utility maximizing voting. "Sophisticated" dispositional voting means voting "insincerely" at the dispositional stage ($q^j \neq r(\hat{x}, \bar{x}^j)$), in order to affect subsequent bargaining over the opinion. So, sophisticated voting means voting "incorrectly" at the dispositional stage in order to join the dispositional majority and participate in bargaining over the opinion's content. Or, for a dominant block, it may mean voting "incorrectly" in order to create a dispositional majority excluding other blocks. While it is possible for a non-dominant block to vote insincerely in order to leave the dispositional majority, this decision must always be dominated by voting sincerely and remaining in the dispositional majority..

A. *Disposition Consistency and Strategic Voting*

When a block places a low value on endorsing its sincere disposition, the temptation to vote strategically may be very strong. Being in the dispositional majority means the block has some chance of being designated the opinion writer and thus be able to announce a more favorable rule x than the other members of the dispositional majority would, and her presence may lead the other bargainers to alter the offers they make in a favorable way to the block.

The strategic vote coupled with the disposition-consistency constraint identified in Section 2, however, may constrain the offers that the strategic block can make. If so, a strategic vote may have a dramatic effect on the structure of the subsequent bargaining game over policy. To grasp the point, recall that the dispositional vote and the case location \hat{x} determine in which of two bargaining sets the final rule will lie because the announced rule must be dispositionally consistent. These two sets are $[-b, \hat{x}]$ which occurs when the dispositional majority endorses disposition 0 and $[\hat{x}, b]$ when the dispositional majority endorses disposition 1. When the blocks vote sincerely, the ideal point of each member of the dispositional majority lies in the bargaining set. If a block votes insincerely, by contrast, the ideal point of the strategic votes lies outside the bargaining set.

Suppose for example that $\hat{x} \in (-1, 0)$ so that the sincere dispositional majority is $\{M, C\}$. If L votes strategically, the court will be dispositionally unanimous but the bargaining game under strategic voting differs from the bargaining game with an unanimous dispositional majority and sincere voting. With sincere voting, the effective bargaining set in the (sincerely) dispositionally unanimous court is the interval $[-1, 1]$ while under strategic voting the effective bargaining set is $[\hat{x}, 1] \subset [-1, 1]$. Thus, when δ is small, while L in a sincere, dispositionally unanimous court would have offered -1 , when L votes strategically and creates a unanimous dispositional majority, she is constrained to offer \hat{x} . When δ is large, the constraint will be binding on L when \hat{x} is closer to M than the compromise offer that L would make in a sincerely unanimous dispositional majority.

A simple example may clarify the intuition. Suppose the policy space concerns the standard of care in auto accidents and that care is completely and accurately captured by the speed at which the car was moving. In the case before the court, the defendant was driving at 60 m.p.h. On a three judge court, let L have an ideal point of 55 m.p.h., M an ideal point of 65 m.p.h. and C an ideal point of 70 m.p.h. Both M and C thus sincerely believe that defendant was not negligent. If everyone votes sincerely, the dispositional majority $\{M,C\}$ will bargain and create a rule that lies in the interval $[65, 70]$. If, on the other hand, L votes strategically and joins the other two blocks in a not negligent disposition, all three blocks will bargain over a rule that lies in the interval $[60, 70]$ – not $[55, 70]$, since the rule applied to a car driving 60 must yield the non-negligent disposition thereby requiring a cut-point of at least 60. If δ were low, and L were the designated opinion writer, L would propose $x = 60$ and that proposal would attract at least M and thereby prevail. L clearly benefits from a strategic vote on the disposition.

B. Dispositional Value Assuring Sincere Dispositional Voting

We now consider a value of D that assures sincere voting under any circumstances.

Proposition 1. (*Value of sincerity assuring sincere voting*) *If $D > \frac{1}{2}$ then all blocks vote sincerely in the dispositional vote ($q^j = r(\hat{x}, \bar{x}^j)$) for all case locations and all values of δ .*

Proof. We seek an upper bound on the value of strategic dispositional voting. We find the upper bound by construction, and proceed in three steps. First, note that the most attractive situation for a justice to vote strategically occurs when the case location is only epsilon distance from her ideal point. Letting epsilon go to zero implies that we can use the results in Table 1 to calculate expected policies under the most attractive situation for strategic voting. Second, reflection indicates that strategic dispositional voting can be profitable relative to sincere voting in 7 cases: 1) a unilateral dominant block under sincere voting becomes a bilateral dominant block under strategic voting (a subordinate block votes strategically); 2) a bilateral dominant coalition becomes a unilateral dominant coalition (dominant block votes

strategically); 3) a bilateral balanced coalition becomes a trilateral balanced coalition; 4) a bilateral dominant coalition becomes a trilateral dominant coalition (subordinate block votes strategically); 5) trilateral dominant coalition with a dominant wing becomes a unilateral dominant coalition; 6) a bilateral dominant coalition becomes a bilateral dominant coalition (dominant M block votes strategically); 7) bilateral balanced coalition becomes a bilateral balanced coalition (M block votes strategically. Third, calculate the maximum possible utility gain to a strategic voter in each case. We illustrate these calculations by showing the analysis of the first case; all others are similar. First, note that all examples of the Case 1 situation are equivalent to just two examples, unilateral L becomes LM, L dominant; and, unilateral L becomes LC, L dominant. In the first example, assume $\hat{x} = 0 - \epsilon$. Under sincere voting, expected policy $E(x) = -1$. Using Table 1 expected policy with strategic voting by M yields expected policy of $-\frac{L}{L+M}$ if $\delta < \frac{L+M}{2L+M}$ and $\frac{M(1-\delta)-L}{M(1-\delta)+L}$ otherwise. Inspection reveals that this value is largest ($-\frac{5}{9}$) at $\delta = 0$ and for the (5,4,0) court, yielding a policy change of $\frac{4}{9}$ and a utility gain to M of $\frac{2}{9}$. In the second example, assume $\hat{x} = 1 - \epsilon$. Under sincere voting, expected policy $E(x) = -1$. Using Table 1 expected policy with strategic voting by C yields expected policy of $\frac{C(1-\delta)-L}{C(1-\delta)+L}$, which has the largest value at $\delta = 0$ and the (5,0,4) court. The expected policy is $-\frac{1}{9}$ yielding a utility of C of $\frac{4}{9}$. Analysis of all cases reveals that the following affords the greatest return from strategic voting: a bilateral balanced coalition becomes a trilateral balanced coalition, which may be analyzed via the example LM balanced L>M going to LMC balanced, $\hat{x} = 1 - \epsilon$. In this case, the maximal difference occurs with the (4,1,4) Court and $\delta = 1$. Using Table 1 expected policy under sincere voting by C is -1 and under strategic voting is 0. This yields a utility gain to C of $\frac{1}{2}$. Hence, dispositional value $D \geq \frac{1}{2}$ deters strategic dispositional voting in all Courts, for all case location, and all discount rates. QED

Discuss the interesting case of (4,1,4) $\delta = 1$, $\hat{x} = 1 - \epsilon$. This is the configuration most vulnerable to strategic dispositional voting.

C. Zero Dispositional Value

Suppose $D = 0$, which is the case most favorable to voting strategically over dispositions. We characterize dispositional voting in this case, considering separate cases in a series of propositions. It proves useful to define $b(\delta, L, M, C) > 0$, which we use to define a distance to the left of -1 or to the right of 1 , but close to those values.

Proposition 2. (*Interior Case Location*) *If $\hat{x} \in [-1, 1]$ and $LC > 0$, there is at least one equilibrium which is dispositionally unanimous.*

Proof. Let B be a block in the dispositional minority. This part follows from the observation that, when $D = 0$, an insincere dispositional vote is costless to B. If B makes a dispositionally insincere vote, by contrast, she becomes part of the dispositional majority and hence, under the random recognition rule, has the opportunity to make an offer. This offer may be as close to her ideal point as \hat{x} – the endorsement consistency constraint bars an offer closer to her ideal point than this. When δ is sufficiently small, it will be in B’s interest to offer \hat{x} and the expected policy of the dispositional majority will be closer to her ideal point than the expected policy of the sincere dispositional majority. QED

Comment 1: If \hat{x} lies strictly in the interior of the interval, then, in this equilibrium, at least one block casts a dispositionally insincere vote.

Comment 2: If no block is dominant, then there may be two equilibria that are dispositionally unanimous. In one a majority of the court votes insincerely over the disposition; in the other a majority votes sincerely over the disposition. The sincere dispositional majority prefers the equilibrium in which the court endorses the disposition favored by the sincere dispositional majority.

Proposition 3. (*Exterior Case without a Dominant Block*) *If $\hat{x} \notin [-1, 1]$ and if no block is dominant, then, in the only equilibrium, every block votes sincerely.*

Proof. Suppose one block were to vote strategically, Since it is not a dominant block, this deviation from sincerity will not change the disposition. But removing the block from the

bargainers means that the outcome must be worse in expectation than if the block remained among the bargainers. Suppose one block will not deviate. Suppose two blocks were to vote strategically. This must change the disposition but this deviation cannot be profitable for M or the distant wing block. To see this, note that a sincere unanimous disposition results in a rule in $[-1, 1]$ while the conjectured strategic disposition results in a rule at \hat{x} . But \hat{x} is farther from M's ideal point and that of the distant wing (either L or C) than the sincere rule in $[-1, 1]$. So two block sophisticated voting cannot be an equilibrium since one of the two blocks would have an incentive to switch. A unanimous sophisticated equilibrium is Nash: two blocks prefer the sincere equilibrium but neither is pivotal nor will the departure of either alter the equilibrium rule, \hat{x} . However, if there is an epsilon chance of a "tremble" to sincerity by one of the blocks, then the other definitely wishes to deviate. On this basis we exclude the conjectured sophisticated unanimous disposition. QED

Proposition 4. (*Exterior but Nearby Case with a Dominant Wing Block*) *If L or C is a dominant block, then $\forall \delta < 1, \exists b(\delta, L, M, C) > 0$, such that if $\hat{x} \in [-b(\delta), -1)$ or if $\hat{x} \in (1, b(\delta)]$ there is an equilibrium in which the dominant block votes dispositionally insincerely and sets policy $x = \hat{x}$.*

Proof. When $\hat{x} \in [-b, -1) \cup (1, b]$, the sincere dispositional majority is unanimous. By assumption a wing J is dominant. If J votes dispositionally insincerely, it creates a new dispositional majority. In this dispositional majority J would set policy as close to her ideal point as possible; the endorsement consistency constraint thus implies that J will set $x = \hat{x}$. the value to J of this policy exceeds the value of the sincere policy for \hat{x} sufficiently close to J's ideal point. QED

Comment 1: The two subordinate blocks are indifferent between a sincere and an insincere dispositional vote. I.e., there is a unilateral equilibrium in which only the dominant block votes insincerely over the disposition.

Comment 2: When $\delta = 1$, the dominant block votes sincerely over the disposition and

announces its ideal point.

Proposition 5. (*Exterior but Nearby Case, Dominant M Block and Empty Wing*) If M is dominant and $LC=0$, then $\forall \delta < 1, \exists b(\delta, L, M, C) > 0$, such that for $\hat{x} \in [-b(\delta), 0)$ or for $\hat{x} \in (0, b(\delta)]$ there is an equilibrium in which M votes dispositionally insincerely and sets policy $x = \hat{x}$.

Proof. As immediately above. The proposition now reflects that M is in effect a wing as either the L block or the C block is empty. QED

Proposition 6. (*Exterior and Distant Case with a Dominant Wing Block*) When L or C is dominant, $\forall \delta < 1, \exists b(\delta, L, C, M) > 0$ such that, for $\hat{x} < -1 - b(\delta)$ and $\hat{x} > 1 + b(\delta)$, a unique, dispositionally sincere equilibrium exists.

Proof. When $\hat{x} < -1 - b(\delta)$ or $\hat{x} > 1 + b(\delta)$, a dispositionally insincere vote requires a dominant wing block J to set policy at $x = \hat{x}$ but by construction of $b(\delta)$ J values this policy less than she values the expected policy in the unanimous sincere dispositional majority. QED

V. Discussion and Conclusion

The analysis of courts uses the same tools that have proven so fruitful in the analysis of other multi-member institutions like legislatures. Proper application of these tools to courts, however, requires that our models reflect the distinctive features of adjudicatory institutions. Our model incorporates a central feature of adjudication: the court announces both a disposition of the case and a rule to govern future cases. This joint production, carried out through a unique voting rule, has several significant analytic consequences. Many of these consequences follow from the fact that the legal rule announced by the court is constrained by the location of the case under consideration because the case location determines the set of policies or rules that the court can announce. In addition, if the judges vote sincerely over the disposition of the case, the case location determines the set of judges who participate in

setting policy. The link between the case location and policy outcomes points toward a new theory of case selection.

Judicial outcomes in our model depend importantly on two other features: the configuration of the court and the parameter δ . The configuration of the court refers to the distribution of ideal points of the judges, which in our model fall into three blocks. Different configurations of the court, given a case location, may produce different rules.¹⁵ When blocks vote sincerely over dispositions, the difference in rule results from a difference in both the set of judges involved in bargaining over the rule and in the set of rules over which those judges bargain. If some blocks have voted strategically over the disposition, different configurations lead to different rules because of differences in the set of rules over which the court bargains.

We interpret δ , the central parameter of our model, as a measure of the toughness of bargaining over the case. The value of δ increases as the importance of the case increases and as judicial resources per case increase. We have shown that, when $\delta = 1$, the majority median model predicts policies that correspond to the predictions of our model under sincere voting in all cases except when the configuration of the court and case location lead to a bilateral, balanced dispositional majority. For all other δ , the predictions of the models diverge more dramatically.¹⁶ These prediction diverge along two dimensions. First, our sequential bargaining model predicts for $\delta < 1$ a distribution of announced rules in a given case, while the median judge and the majority median models predict a single rule. Second, the expected policy in the sequential bargaining model may differ from the policy predicted by the median judge and majority median models.

Our model strongly suggests the importance of the assignment power. Supreme court practice grants the senior justice in the dispositional majority the power to assign the opinion in the case. The framework of the above game can be extended to include this move if we understand the assignment power as simply an identification of the first mover in the game.¹⁷ The Chief Justice is *ex officio* the most senior justice on the Court. He thus has an incentive always to be in the dispositional majority as he can assure himself the best possible opinion.

Finally, the model suggests several important consequences for judicial appointments. Conventional wisdom holds that an appointment has policy significance only if it shifts the median justice. In our model, however, an appointment may have a significant impact even when it does not move the median. Consider for example a court on which the three blocks are initially of equal size; we have the partition $(3, 3, 3)$. Suppose one justice exits. In these circumstances, the new appointment can never change the median, it will always lie in block M. The ideology of the new justice nevertheless has significant consequences in our model. Suppose for example that a justice in M exits and the new justice is appointed to a wing. In both bilateral and trilateral balanced coalitions – the only coalitions possible in both the old and new court – the appointment of the new justice will have significant effects on the distribution of policies announced. For low δ , an appointment to the wing implies that the ideal point of that wing will prevail more often than the ideal point of M in bilateral balanced coalitions and more frequently than either M's or the other wing's ideal point. For high δ , in bilateral balanced coalitions, policy will shift towards the ideal point of the wing to which the new justice was appointed.

A Appendix One

Unilateral Majorities.—Let the superscript D denote the block with the unilateral majority.

Proposition 7. (*Unilateral Coalitions*). For all $\delta \in [0, 1]$, a configuration of pure strategies is a sub-game perfect equilibrium in an infinite round, k -majority multi-member court with a single (dominant) coalition in the dispositional majority if and only if it has the following form: (1) A member of the unilateral coalition offers the proposed majority opinion $x^{D*} = \bar{x}^D$, and (2) the unilateral coalition votes for the proposed opinion according to

$$w^{D*}(x^D) = \begin{cases} 1 & \text{if } u^D(x^D) \geq \delta v^D \\ 0 & \text{otherwise} \end{cases}$$

Proof. The proposal strategy is obvious. Given the proposal strategy, the continuation value of the game is $\delta \bar{x}^D$ irrespective of the round of play. Clearly the unilateral majority block will join proposed majority opinions if and only if the proposal affords as much or more utility as $\delta \bar{x}^D$. For all $\delta < 1$ this implies there will be a range of acceptable proposed opinions other than \bar{x}^D , but none will be observed in the course of play. QED

Bilateral Dominant Majorities.—Again let superscript D to refer to the dominant block.

Lemma 8. (*Dominant Block Behavior in Bilateral Dominant Coalitions*). For all $\delta \in [0, 1]$, a strategy profile is a strategy profile of a sub-game perfect equilibrium in an infinite round, k -majority multi-member court with a bilateral dominant coalition D in the dispositional majority if and only if the strategy of the dominant block has the following form when it receives the opinion assignment : (1) the dominant block proposes the opinion $x^{D*} = \bar{x}^D$;

(2) after making a proposal the dominant block votes according to

$$w_t^{D*}(x^D) = \begin{cases} 1 & \text{if } u_t^D(x^D) \geq \delta v_{t+1}^D \\ 0 & \text{otherwise} \end{cases}$$

Proof. Sufficiency follows from the fact that no deviation from this profile could be profitable for a dominant block. Necessity follows from the fact that any other candidate strategy profile for the dominant block conditional on receipt of the opinion assignment or after making a proposal would necessarily yield a lower payoff in some sub-game. Note that this portion of the strategy profile is a dominant strategy: it holds regardless of the strategy of the Subordinate block. QED

Two issues then remain: 1) what offer does the subordinate block make when it receives the opinion assignment? And, 2) how will the subordinate block vote, in particular, will it join the dominant block's opinion or will it concur?

The key to answering the first question is the following relation: $u^d(x_t^s) \geq \delta v_{t+1}^d$. In words, the utility to the dominant block from accepting the subordinate block's offer must be greater than or equal to the utility the dominant block receives from rejecting the offer and continuing to play the game, which is simply the continuation value of the game. This condition is both necessary and sufficient for the dominant block to accept the subordinate block's offer.

In considering the second question, a problem familiar from many voting games arises, namely, the joint behavior of the subordinate block is immaterial once the dominant block receives the opinion assignment and behaves as indicated in Lemma 2, because the vote of the subordinate block is not pivotal in the collective choice over the offer x^D . However, as is often done in voting games, we will assume the subordinate block acts as if it were pivotal. This means that a similar condition must hold for the subordinate block if it is to join the dominant block's opinion, namely, $u^S(x_t^D) \geq \delta v_{t+1}^S$.

Let D denote the dominant block and S denote the subordinate block.

Proposition 9. (*Bilateral Dominant Coalitions*) For all $\delta \in [0, 1]$ a configuration of pure strategies is a sub-game perfect equilibrium in an infinite round, k -majority multi-member court with bilateral dominant coalitions in the dispositional majority if and only if it has the following form: (1) when given the opinion assignment a member of the dominant block proposes a majority opinion $x^{D*} = \bar{x}^D$; (2) when given the opinion assignment a member of the subordinate block proposes the majority opinion

$$x^{S*} = \begin{cases} \bar{x}^D + \frac{2(D+S)(1-\delta)}{D+S(1-\delta)} I & \text{if } \delta > \delta^* \\ \bar{x}^S & \text{if } \delta \leq \delta^* \end{cases}$$

where $\delta^* = \begin{cases} \frac{D+S}{2D+S} & \text{if } |\bar{x}^S| \neq |\bar{x}^D| \\ 0 & \text{if } |\bar{x}^S| = |\bar{x}^D| \end{cases}$ and $I = \begin{cases} 1 & \text{if } \bar{x}^S > \bar{x}^D \\ -1 & \text{if } \bar{x}^S < \bar{x}^D \end{cases}$; and, (3) each member of the dispositional majority votes for or against the proposed opinion according to

$$w^{i*}(x^j) = \begin{cases} 1 & \text{if } u^i(x^j) \geq \delta v^i \\ 0 & \text{otherwise} \end{cases} \quad i, j = (S, D)$$

where $v^i = \frac{D}{D+S}u^i(x^{D*}) + \frac{S}{D+S}u^i(x^{S*})$.

Proof. To be typed. Indicate the entities for each of the 6 coalitions. $\{\{L,M\},C\}$ with $L>M$; $\{L,\{M,C\}\}$ with $M>C$ and $\{\{L,M\},C\}$ with $M>L$; and $\{L,\{M\},C\}$ with $L>C$ and $C>L$. $\{-,\{D,S\}\}$, $\{\{S,D\},-\}$, $\{-,\{S,D\}\}$, $\{\{D,S\},-\}$, $\{D,\{-\},S\}$, $\{S,\{-\},D\}$

The comparative statics of majority opinion content are indicated in the following Corollary.

Corollary 10. (*Block Size and the Content of Majority Opinions with Bilateral Dominant Coalitions*) The Dominant block does not modify the content of its proposed majority opinion as the sizes of the two blocks vary. Similarly, if $\delta < \delta^*$ the Subordinate block does not modify the content of its proposed majority opinion, as the sizes of the blocks vary. But if $\delta > \delta^*$ the proposed majority opinion of the Subordinate block becomes tougher (moves away from the

ideal policy of the Dominant block and toward its own ideal policy) as S increases in size, and becomes more accommodating (moves toward the ideal policy of the Dominant block) as D increases in size.

Proof. The "does not vary portion" is obvious, since D always offers its ideal policy, as does S when $\delta < \delta^*$. When $\delta > \delta^*$ then $x^{S*} = \bar{x}^D + \frac{2(D+S)(1-\delta)}{D+S(1-\delta)}I$. If so, $\frac{\partial}{\partial S}x^{S*} = (\frac{2D(1-\delta)\delta}{(D+S(1-\delta))^2})I$. Note that the term in parenthesis is necessarily positive. And $\frac{\partial}{\partial D}x^{S*} = (-\frac{2S(1-\delta)\delta}{(D+S(1-\delta))^2})I$ and the term in parenthesis is necessarily negative. QED

Actual voting behavior – joining or concurring – follows from the voting strategies combined with the majority opinions proposed by the D and S blocks. The following Corollary summarizes predicted observed voting behavior among members of the majority disposition.

Corollary 11. (*Voting Behavior in Bilateral Dominant Coalitions*). *The Dominant block joins all (equilibrium) proposed majority opinions: $w^D(x^{i*}) = 1, i = (D, S)$. The Subordinate block joins its own proposals $w^S(x^{S*}) = 1, i = (D, S)$. In response to the proposal of the Dominant coalition $w^S(x^{D*}) = \begin{cases} 1 & \text{if } \delta < \tilde{\delta} \\ 0 & \text{otherwise} \end{cases}$ where $\tilde{\delta} = \begin{cases} \frac{D+S}{D+2S} & \text{if } |\bar{x}^S| \neq |\bar{x}^D| \\ 1 & \text{if } |\bar{x}^S| = |\bar{x}^D| \end{cases}$.*

Bilateral Balanced Majorities. —

Proposition 12. (*Bilateral balanced coalitions*) *For all $\delta \in [0, 1]$ a configuration of pure strategies is a sub-game perfect equilibrium in an infinite round, k -majority multi-member court with bilateral balanced coalition in the dispositional majority if and only if it has the following form: (1) when given the opinion assignment a member of the greater block proposes a majority opinion*

$$x^{G*} = \begin{cases} (1 - \frac{2S}{G+S}\delta) I & \text{if } \bar{x}^G = -\bar{x}^S \\ \bar{x}^G & \text{if } \bar{x}^G \neq -\bar{x}^S \text{ and } \delta < \delta_S^{**} \\ \bar{x}^G + (1 - \frac{3S}{G+S}\delta) I^G & \text{if } \bar{x}^G \neq -\bar{x}^S \text{ and } \delta \geq \delta_S^{**} \end{cases}$$

where $I = \begin{cases} 1 & \text{if } G = C \\ -1 & \text{if } G = L \end{cases}$, $I^G = \begin{cases} 1 & \text{if } \bar{x}^G > \bar{x}^S \\ -1 & \text{if } \bar{x}^G < \bar{x}^S \end{cases}$ and $\delta_S^{**} = \frac{1}{3} \frac{G+S}{S}$; (2) when given the opinion assignment a member of the smaller block proposes the majority opinion

$$x^{S*} = \begin{cases} (1 - \frac{2G}{G+S}\delta) I & \text{if } \bar{x}^G = -\bar{x}^S \\ \bar{x}^S & \text{if } \bar{x}^G \neq -\bar{x}^S \text{ and } \delta < \delta_G^* \\ \bar{x}^S + (1 - \frac{2G}{G+S-S\delta}\delta) I^S & \text{if } \bar{x}^G \neq -\bar{x}^S \text{ and } \delta_G^* \leq \delta < \delta_S^{**} \\ \bar{x}^S + (1 - \frac{3G}{G+S}\delta) I^S & \text{if } \bar{x}^G \neq -\bar{x}^S \text{ and } \delta \geq \delta_S^{**} \end{cases}$$

where $I^S = \begin{cases} 1 & \text{if } \bar{x}^S > \bar{x}^G \\ -1 & \text{if } \bar{x}^S < \bar{x}^G \end{cases}$ and $\delta_G^* = \frac{G+S}{S+2G}$; and, (3) each member of the dispositional majority votes for or against the proposed opinion according to

$$w^{i*}(x^j) = \begin{cases} 1 & \text{if } u^i(x^j) \geq \delta v^i \\ 0 & \text{otherwise} \end{cases} \quad i, j = (S, G)$$

where $v^i = \frac{G}{G+S}u^i(x^{G*}) + \frac{S}{G+S}u^i(x^{S*})$.

Proof. To be typed.

((Note what happens when G=S.))

The proposition is cumbersome to express but the underlying structure is fairly simple. When one block resides on a "wing" and one block is moderate, there are three possibilities, which depend on the value of δ . First, when δ is sufficiently low, both blocks offer their ideal policy when they have the opinion assignment (how low δ must be depends on the relative size of the blocks). Call this situation the "two push-over equilibrium." Second, for intermediate values of δ and block sizes that aren't too similar in size, the greater (larger) block offers its ideal point when it receives the opinion assignment but the smaller block offers a compromise policy if it has the chance. Call this situation the "one push-over equilibrium." Third, for high levels of δ and block sizes that aren't too dissimilar, both blocks offer compromise

policies. Call this the "no push-over equilibrium." Finally, a special case occurs when both blocks are "wings"; this could occur in a polarized court such as $\{4,0,4\}$ when there is a unanimous disposition but one member of the greater block recuses herself. In this rather odd case, both blocks offer compromise policies when they have the opinion assignment, regardless of the level of δ . In all these cases, the non-authoring block joins the proffered majority opinion, so the join coalition is unanimous.

The following Corollary makes more precise the relationship between block size, δ , and the existence of the three equilibria.

Corollary 13. *Given block sizes compatible with a bilateral balanced coalition: (1) For any block size and any given δ , $0 \leq \delta \leq 1$, one and only one of the three equilibria exists; (2) For any block size, a) there exists a range of deltas, $0 < \delta \leq \delta_G^*$, such that the two-pushover equilibria exists; b) there exists a range of deltas, $\delta > \delta_G^*$, such that the two-pushovers equilibrium does not exist; c) $\frac{5}{9} \leq \delta_G^* \leq \frac{2}{3}$; (3) If the two-pushover equilibrium does not exist, then either a) $G \geq 2S$ and only the one-pushover equilibrium exists for all δ , $0 \leq \delta \leq 1$, b) $G = S$ and only the no-pushover equilibrium exists for all δ , $0 \leq \delta \leq 1$; or c) $S < G < 2S$ and i) $\delta \leq \delta_S^{**}$ in which case only the one-pushover equilibrium exists, or ii) $\delta > \delta_S^{**}$ and only the no-pushover equilibrium exists.*

Proof. Part 1. This follows from inspection of the conditions defining the existence of each type of equilibria. Part 2. The δ defining the upper bound of the two-pushovers equilibrium is $\delta_G^* = \frac{G+S}{S+2G}$, which must be greater than zero. In fact, the smallest it can be is $\frac{5}{9}$, which occurs when $G = 4$ and $S = 1$. And, the largest it can be is $\frac{2}{3}$, which occurs when $G = S$. In other words, for any block size leading to a bilateral balanced coalition, there exists a sufficiently small $\delta > 0$ such that the two-pushovers equilibrium exists, and a sufficiently large $\delta < 1$ such that the two-pushovers equilibrium does not exist. Part 3. The δ defining the upper bound of the one-pushover equilibrium is $\delta_S^{**} = \frac{1}{3} \frac{G+S}{S}$. This upper bound falls as S increases and reaches δ_G^* when $G = S$, so that the one-pushover equilibrium does not exist. Conversely, if $G \geq 2S$ then $\delta_S^{**} \geq 1$ and the one-pushover equilibrium extends to the

largest possible delta, $\delta = 1$. In other words, the no-pushovers equilibrium does not exist. This situation occurs with a $\{\{4,1\},4\}$ Court and a $\{\{4,2\},3\}$ Court. Suppose $S < G < 2S$. The the conditions follow directly from the Proposition. QED

The following Corollary addresses the behavior of majority opinions as δ goes to one, that is, as the case becomes very important and the bargaining becomes very tough. First, define the distance between G 's and S 's proffered opinions $\Delta(\delta) \equiv x^{G*} - x^{S*}$. Second, suppose in the limit the two opinions are the same, so $x^{G*}|_{\delta=1} = x^{S*}|_{\delta=1}$. Then define the convergence point $x^*|_{\delta=1} \equiv x^{i*}|_{\delta=1}, i = (S, G)$.

Corollary 14. *(Limit values of majority opinions in bilateral balanced coalitions). In bilateral balanced coalitions: (1) $\lim_{\delta \rightarrow 1} \Delta(\delta) = 0$; (2) If $\bar{x}^G = -\bar{x}^S$ then*

$$x^*|_{\delta=1} = \frac{C - L}{C + L} = \bar{x}^L \frac{L}{C + L} + \bar{x}^C \frac{C}{C + L}$$

(3) If $\bar{x}^G \neq -\bar{x}^S$ then in the one-pushover equilibrium $x^*|_{\delta=1} = \bar{x}^G$ and in the no-pushover equilibrium

$$x^*|_{\delta=1} = \bar{x}^G + \left(1 - \frac{3S}{G + S}\right) I^G = \bar{x}^S + \left(1 - \frac{3G}{G + S}\right) I^S$$

Proof. Part 1. First consider $\bar{x}^G \neq -\bar{x}^S$. From the previous Corollary, at $\delta = 1$ either the one-pushover equilibrium holds, or the no-pushover equilibrium. In the former case using Proposition x, $\Delta(\delta = 1) = \bar{x}^G - (\bar{x}^S - I^S)$. But $(\bar{x}^S - I^S)$ must equal \bar{x}^G given $\bar{x}^G \neq -\bar{x}^S$ and $\bar{x}^G, \bar{x}^S = (-1, 0, 1)$. In the no-pushover equilibrium, either $\Delta(\delta) = 3(1 - \delta)$ or $3(\delta - 1)$ (after some algebra), which both equal 0 at $\delta = 1$. If $\bar{x}^G = -\bar{x}^S$ then $\Delta(\delta) = 2(1 - \delta)$ or $2(\delta - 1)$ (after some algebra), which both equal 0 at $\delta = 1$. Parts 2 and 3 follow immediately from the Proposition, using $\delta = 1$.

The Corollary indicates that, as δ approaches one, the opinions proffered by both blocks converge, and at $\delta = 1$ both blocks offer the same opinion. But what do the opinions converge to? In the special case that $G = S$, the two offers converge to the exact center of the space

spanned by the two blocks. Otherwise, the convergence point moves toward the ideal point of the larger block. In fact, when the two blocks are both end blocks, the convergence point is simply the block-size weighted average of the two ideal policies. However, when one block is a wing and one block is the moderate block, the convergence point moves somewhat closer to the larger block.

Note that convergence to the median member of the dispositional coalition is a special case. This case occurs when a wing block faces the moderate block, and one of the blocks is so much larger than the other that the one-pushover equilibrium holds at $\delta = 1$ (see the prior Corollary). In that case, at $\delta = 1$ the smaller block offers the ideal policy of the larger block, which corresponds to ideal point of the median member of the dispositional majority. However, if the block sizes are less unequal so the no-pushover equilibrium holds, the convergence point is never the ideal point of the median member.

Trilateral Dominant Majorities.—Denote the dominant block as D . The dominant block. The dominant block may be the center block M , in which case both of the subordinate blocks are wing blocks; denote a subordinate wing block as W . Or, the dominant block may be either C or L and the two subordinate blocks be M and the other wing, W . In a trilateral dominant coalition, the dominant block must join a proposed majority opinion if it is to become the actual majority opinion.

Proposition 15. *(Trilateral dominant coalitions) For all $\delta \in [0, 1]$ a configuration of pure strategies is a stationary sub-game perfect equilibrium in an infinite round, k -majority multi-member court with a trilateral dominant coalition in the dispositional majority if and only if it has the following form: (1) upon receipt of the opinion assignment a block proposes the majority opinion*

$$x^{D*} = \bar{x}^D$$

and if $D = M$

$$x^{W*} = \begin{cases} \bar{x}^W & \text{if } \delta < \frac{9}{9+M} \\ \bar{x}^M + \left(-\frac{18(1-\delta)}{9(1-\delta)+M\delta}\right) I & \text{if } \delta \geq \frac{9}{9+M} \end{cases} \quad W = (L, C)$$

while if $D = L$ or $D = C$

$$x^{W*} = \begin{cases} \bar{x}^W + \left(\frac{(M+2D)\delta}{9+W\delta}\right) I & \text{if } \delta < \frac{9}{9+D} \\ \bar{x}^M + \left(1 - \frac{2D\delta}{9(1-\delta)+D\delta}\right) I & \text{if } \delta \geq \frac{9}{9+D} \end{cases} \quad W = (L, C)$$

$$x^{M*} = \begin{cases} \bar{x}^M & \text{if } \delta < \frac{9}{9+D} \\ \bar{x}^M + \left(1 - \frac{2D\delta}{9(1-\delta)+D\delta}\right) I & \text{if } \delta \geq \frac{9}{9+D} \end{cases}$$

where $I = \begin{cases} 1 & \text{if } W = L \\ -1 & \text{if } W = C \end{cases}$; and (2) each member of the dispositional majority votes for or against the proposed opinion according to

$$w^{i*}(x^j) = \begin{cases} 1 & \text{if } u^i(x^j) \geq \delta v^i \\ 0 & \text{otherwise} \end{cases} \quad i, j = (L, M, C)$$

where $v^i = \frac{L}{9}u^i(x^{L*}) + \frac{M}{9}u^i(x^{M*}) + \frac{C}{9}u^i(x^{C*})$.

Proof. Type out in more detail. Sufficiency just shows the above is an equilibrium. Necessity adds: a one-compromiser equilibrium cannot exist when $D = M$; and, a no-compromiser equilibrium cannot exist when D is a wing. And no three-compromiser equilibrium can ever exist, since D will defect to its ideal point.

The Proposition, while dense looking, has a simple structure. First, the dominant block always offers its ideal point when it has the opinion assignment. It then joins its own opinion and ends the bargaining. If M is the dominant block and one of the wings receives the opinion assignment, the wing's offer depend on the value of δ . If δ is low ($\delta < \frac{9}{9+M}$), the

wing offers its ideal point, which M joins so that the opinion becomes the majority opinion. Call this an "accommodating" equilibrium since all the players offer their own ideal points as opinions. If δ is high ($\delta \geq \frac{9}{9+M}$), the wing with the assignment offers the dominant Moderate block a compromise policy whose value depends on the size of the moderate block and δ (we return to offers shortly). Call this a "two-compromiser" equilibrium, since both non-dominant blocks offer compromise opinions. Suppose, instead, the dominant block is a wing, either L or C . Then if δ is low ($\delta < \frac{9}{9+D}$) the moderate block offers its ideal point when it has the assignment but the subordinate wing offers a compromise policy when it has the assignment. Call this a "one-compromiser" equilibrium since only the subordinate wing block, not the Moderate block, offers a compromise opinion. If δ is high ($\delta \geq \frac{9}{9+D}$), both the moderate block and the subordinate wing offer compromise policies when they have the assignment, indeed, they offer the same compromise policy. Again, this is a two-compromiser equilibrium.

The following corollary addresses equilibrium voting behavior. //Add Corollary //

The following corollary addresses the comparative statics of offers in more detail. //Add Corollary//

Trilateral Balanced Majorities.—In trilateral balanced coalitions, all three blocks are members of the dispositional majority (the dispositional vote was unanimous). In addition, no block contains five or more members.

Proposition 16. *(Trilateral balanced coalitions) For all $\delta \in [0, 1]$ a configuration of pure strategies is a stationary sub-game perfect equilibrium in an infinite round, k -majority multi-member court with a trilateral balanced coalition in the dispositional majority if and only if it has the following form: (1) upon receipt of the opinion assignment a block proposes the majority opinion*

$$x^{i*} = \begin{cases} \bar{x}^i & \text{if } \delta < \delta_M^* \\ \bar{x}^M + \left(\frac{18(1-\delta)}{9(1-\delta)+M\delta} \right) I & \text{if } \delta \geq \delta_M^* \end{cases}$$

where $\delta_M^* = \frac{9}{9+M}$ and $I = \begin{cases} 1 & \text{if } i = C \\ 0 & \text{if } i = M \\ -1 & \end{cases}$; and (2) each member of the dispositional majority votes for or against the proposed opinion according to

$$w^{i*}(x^j) = \begin{cases} 1 & \text{if } u^i(x^j) \geq \delta v^i \\ 0 & \text{otherwise} \end{cases} \quad i, j = (L, M, C)$$

where $v^i = \frac{L}{9}u^i(x^{L*}) + \frac{M}{9}u^i(x^{M*}) + \frac{C}{9}u^i(x^{C*})$.

Proof. (Remains incomplete). We first address sufficiency, by constructing the indicated equilibrium. We then address necessity, by showing that all other logical possibilities for equilibria cannot hold. Part 1.//Type// Part 2. We now turn to other candidates for equilibria. 1) A one compromiser equilibrium. There are two possibilities. 1a) One wing compromises, M and other wing do not. In this equilibrium, it must be the case that the compromising wing cannot deviate to its ideal point, otherwise M rejects. And, it must be the case that M accepts the non-compromising wing's offer of its ideal point. Using the value functions and the same techniques employed earlier, it is straightforward to show that a wing offers M a compromise offer only if $\delta > \frac{9}{9+M}$. It is also straightforward to show that in the postulated equilibrium M will accept the non-compromising wing's ideal point only if $\delta \leq \frac{9}{9+M}$. So if δ is high enough to induce one wing to compromise, it is also high enough so that M will not accept the other wing's ideal point. 1b) M compromises, neither wing does. In Part 1 we showed that if both wings offer their ideal points and M offers its ideal point, at least one wing (the smaller wing) will accept M's offer for any value of δ . If both wings are the same size, then both will accept $x^M = 0$ for any δ . Consequently, in the postulated equilibrium, M can deviate from the compromise offer and instead offer its ideal point, which at least one wing will accept. Since M would prefer to offer its ideal point if accepted, this kills the postulated equilibrium. So, a one compromiser equilibrium is not possible. 2) Two compromiser equilibrium in which one of the compromisers is M. There are four possibilities.

The first two are 2a) smaller wing compromises aimed at M, M compromises aimed at smaller wing, larger wing offers ideal point which M accepts. 2b) smaller wing compromises aimed at M, M compromises aimed at larger wing, larger wing offers its ideal point which is accepted by M. If M deviates and offers the smaller wing M's ideal point, the smaller wing will accept it. To see this, note that the smaller wing's continuation value must be smaller than in the accommodating equilibrium (this is because M makes a worse offer from the smaller wing's perspective, and the smaller wing makes a compromise). But we showed that the smaller wing would always accept M's ideal point in the accommodating equilibrium (in other words, a utility of 1/2 is larger than the continuation value of the accommodating equilibrium for all δ). Therefore the smaller wing will accept M's ideal point in this conjectured equilibrium.

Offers in this configuration are straightforward. For cases in which δ is relatively low the judges offer their ideal points. For high δ cases, the Moderate block continues to offer its ideal point, but the wing blocks offer compromise policies lying between their ideal points and the Moderate block. These compromise policies converge as delta goes to 1, and in fact converge exactly on the ideal point of the moderate block. So in this limiting case, policy lies at the ideal point of the Court's median justice, who is also the median of the dispositional majority.

// Corollary on location of opinions, stating and proving above formally //

Corollary 17. *(Voting Behavior in Trilateral Balanced Coalitions) The following describe voting behavior in trilateral balanced dispositional coalitions in response to equilibrium proposed majority opinions:*

$$\begin{aligned}
w^M(x^{i^*}) &= 1, i = (L, C) \\
w^i(x^{i^*}) &= 1, i = (L, M, C) \\
w^i(x^{M^*}) &= \begin{cases} 0 & \text{if } \delta > \frac{9}{9+M} \text{ and } \min\{\frac{9}{3C-L}, \frac{9}{3L-C}\} < \delta < 1 \\ 1 & \text{otherwise} \end{cases} \quad i = (L, C) \\
w^i(x^j) &= 0 \quad i \neq j, i, j = (L, C)
\end{aligned}$$

Proof. It is convenient to consider separately $\delta < \frac{9}{9+m}$ and $\delta \geq \frac{9}{9+M}$. Case 1: $\delta < \frac{9}{9+m}$. By construction, M is willing to joining opinions at the ideal points of the wings. Consider the wings joining M's opinion, written at M's ideal point. For both L and C, joining this opinion brings utility of $\frac{1}{2}$ while the continuation value of the game is $\delta \left(\frac{L}{9} + \frac{M}{18}\right)$ and $\delta \left(\frac{M}{18} + \frac{C}{9}\right)$ respectively. It follows that L and C will be willing to join M's opinion for values of δ less than or equal to $\frac{9}{9+L-C}$ and $\frac{9}{9+C-L}$. But both of these values are greater than $\frac{9}{9+m}$, hence both wings join M's opinions. The wings do not join each other's opinions, since doing so brings utility of 0 while the continuation value is always greater than zero for $\delta < 1$. Trivially, each block joins its own opinions. Case 2: $\delta \geq \frac{9}{9+M}$. By construction, M joins the compromise offers from the wings. The value of M's offer to the wings is again $\frac{1}{2}$ while the continuation value to the wings reflects both of the compromise offers. For example, the continuation value for L is $-\frac{9-M(2-\delta)-4L(1-\delta)-9\delta}{2(9-(9-M)\delta)}$. Some algebra shows that the continuation values can be greater than $\frac{1}{2}$ but only for the condition indicated in the Corollary ($\min\{\frac{9}{3C-L}, \frac{9}{3L-C}\} < \delta < 1$). This condition can hold only for the coalitions (4,4,1), (4,3,2), (1,4,4) and (2,3,4). Now consider the wings' response to an offer from the opposite wing. The continuation value of the game remains the same, but the value of the offer is lower than for M's offer, e.g., the value of C's offer to L is $\frac{9-(9+M)\delta}{2((9-M)\delta-9)}$, and some algebra shows that this is always less than the continuation value of the game. Again, all blocks always accept their own offer. QED

The Corollary states that the Moderate block always joins opinions proposed by the wings, and the wings almost always join opinions proposed by the Moderate block. The sole exception occurs when δ is close to one, and one of the blocks is nearly dominant, that is, when the block has four members and the opposing wing has only one or two members. In such a case, the nearly dominant block will reject the Moderate's offer (though the Moderate block will join a proposed opinion from the nearly dominant block). As a result of the proposing and joining behavior, the Moderate block is always a member of the join coalition. Perhaps surprisingly, join coalitions need not be minimum winning – they can be unanimous, but only when the Moderate block is the opinion author. When a wing block is the proposer,

join coalitions are always minimum-winning in size.

Coalition	L Proposal	M Proposal	C Proposal	Expected Policy
<i>1 Unilateral Dispositional Coalitions</i>				
<i>L</i>	-1	None	None	-1
<i>M</i>	None	0	None	0
<i>C</i>	None	None	1	1
<i>2 Bilateral Dominant Dispositional Coalitions</i>				
<i>MC M-Dom</i>	None	0	1 if $\delta < \frac{C+M}{C+2M}$ $\frac{2(C+M)(1-\delta)}{M+C(1-\delta)}$ otherwise	$\frac{C}{C+M}$ if $\delta < \frac{C+M}{C+2M}$ $\frac{2C(1-\delta)}{M+C(1-\delta)}$ otherwise
<i>MC C-Dom</i>	None	0 if $\delta < \frac{C+M}{2C+M}$ $\frac{C\delta-(C+M)(1-\delta)}{C+M(1-\delta)}$ otherwise	1	$\frac{C}{C+M}$ if $\delta < \frac{C+M}{2C+M}$ $\frac{C-M(1-\delta)}{C+M(1-\delta)}$ otherwise
<i>LM L-Dom</i>	-1	0 if $\delta < \frac{L+M}{2L+M}$ $\frac{(L+M)(1-\delta)-L\delta}{C+M(1-\delta)}$ otherwise	None	$-\frac{L}{L+M}$ if $\delta < \frac{L+M}{2L+M}$ $\frac{M(1-\delta)-L}{M(1-\delta)+L}$ otherwise
<i>LM M-Dom</i>	-1 if $\delta < \frac{L+M}{L+2M}$ $-\frac{2(L+M)(1-\delta)}{L(1-\delta)+M}$ otherwise	0	None	$-\frac{L+M}{L+2M}$ if $\delta < \frac{L+M}{L+2M}$ $-\frac{2L(1-\delta)}{L(1-\delta)+M}$ otherwise
<i>LC L-Dom</i>	-1	None	$\frac{(C+L)(1-\delta)-L\delta}{C(1-\delta)+L}$	$\frac{C(1-\delta)-L}{C(1-\delta)+L}$
<i>LC C-Dom</i>	$-\frac{(C+L)(1-\delta)-C\delta}{L(1-\delta)+C}$	None	1	$\frac{C-L(1-\delta)}{C+L(1-\delta)}$
<i>3 Bilateral Balanced Dispositional Coalitions</i>				
<i>MC M > C</i>	None	0 if $\delta < \frac{C+M}{3C}$ $-\frac{M+C(1-3\delta)}{C+M}$ otherwise	1 if $\delta < \frac{C+M}{C+2M}$ $\frac{2(C+M)(1-\delta)}{M+C(1-\delta)}$ if $\frac{C+M}{C+2M} \leq \delta < \frac{C+M}{3C}$ $\frac{2C+M(2-3\delta)}{C+M}$ otherwise	$\frac{C}{C+M}$ if $\delta < \frac{C+M}{C+2M}$ $\frac{2C(1-\delta)}{M+C(1-\delta)}$ if $\frac{C+M}{C+2M} \leq \delta < \frac{C+M}{3C}$ $\frac{2C-M}{C+M}$ otherwise
<i>MC C > M</i>	None	0 if $\delta < \frac{C+M}{2C+M}$ $-\frac{C(1-2\delta)+M(1-\delta)}{C+M(1-\delta)}$ if $\frac{C+M}{2C+M} \leq \delta < \frac{C+M}{3M}$ $-\frac{C(1-3\delta)+M}{C+M}$ otherwise	1 if $\delta < \frac{C+M}{3M}$ $\frac{2C+M(2-3\delta)}{C+M}$ otherwise	$\frac{C}{C+M}$ if $\delta < \frac{C+M}{2C+M}$ $\frac{C-M(1-\delta)}{M+C(1-\delta)}$ if $\frac{C+M}{2C+M} \leq \delta < \frac{C+M}{3M}$ $\frac{2C-M}{C+M}$ otherwise
<i>MC C = M</i>	None	0 if $\delta < \frac{C+M}{2C+M} = \frac{2}{3}$ $-\frac{M+C(1-3\delta)}{C+M}$ otherwise	1 if $\delta < \frac{C+M}{2C+M} = \frac{2}{3}$ $\frac{2C+M(2-3\delta)}{C+M}$ otherwise	$\frac{C}{C+M} = \frac{1}{2}$ if $\delta < \frac{C+M}{2C+M}$ $\frac{2C-M}{C+M} = \frac{1}{2}$ otherwise
<i>LM L > M</i>	-1 if $\delta < \frac{L+M}{L+2M}$ $-\frac{2L+M(2-3\delta)}{L+M}$ otherwise	0 if $\delta < \frac{L+M}{2L+M}$ $\frac{(L-M)(1-\delta)-L\delta}{L+M(1-\delta)}$ if $\frac{L+M}{2L+M} \leq \delta < \frac{L+M}{3M}$ $\frac{M+L(1-3\delta)}{L+M}$ otherwise	None	$-\frac{L}{L+M}$ if $\delta < \frac{L+M}{2L+M}$ $-\frac{L-M(1-\delta)}{L+M(1-\delta)}$ if $\frac{L+M}{2L+M} \leq \delta < \frac{L+M}{3M}$ $\frac{M-2L}{L+M}$ otherwise
<i>LM M > L</i>	-1 if $\delta < \frac{L+M}{L+2M}$ $-\frac{2(L-M)(1-\delta)}{M+L(1-\delta)}$ if $\frac{L+M}{L+2M} \leq \delta < \frac{L+M}{3L}$ $-\frac{2L+M(2-3\delta)}{L+M}$ otherwise	0 if $\delta < \frac{L+M}{3L}$ $\frac{M+L(1-3\delta)}{L+M}$ otherwise	None	$-\frac{L}{L+M}$ if $\delta < \frac{L+M}{L+2M}$ $-\frac{2L(1-\delta)}{L(1-\delta)+M}$ if $\frac{L+M}{L+2M} \leq \delta < \frac{L+M}{3L}$ $\frac{M-2L}{L+M}$ otherwise
<i>LM L = M</i>	-1 if $\delta < \frac{L+M}{L+2M} = \frac{2}{3}$ $-\frac{2L+M(2-3\delta)}{L+M}$ otherwise	0 if $\delta < \frac{L+M}{L+2M} = \frac{2}{3}$ $\frac{M+L(1-3\delta)}{L+M}$ otherwise	None	$-\frac{L}{L+M} = -\frac{1}{2}$ if $\delta < \frac{L+M}{L+2M}$ $\frac{M-2L}{L+M} = -\frac{1}{2}$ otherwise
<i>4 Trilateral Dominant Dispositional Coalitions</i>				
<i>LMC L-Dom</i>	-1	0 if $\delta < \frac{9}{9+L}$ $\frac{9(1-\delta)-L\delta}{9(1-\delta)+L\delta}$ otherwise	$\frac{9(1-\delta)-L\delta}{9-C\delta}$ if $\delta < \frac{9}{9+L}$ $\frac{9(1-\delta)-L\delta}{9(1-\delta)+L\delta}$ otherwise	$-\frac{L-C(1-\delta)}{9-C\delta}$ if $\delta < \frac{9}{9+L}$ $\frac{(9-L)(1-\delta)-L}{9(1-\delta)+L\delta}$ otherwise
<i>LMC M-Dom</i>	-1 if $\delta < \frac{9}{9+M}$ $-\frac{18(1-\delta)}{9(1-\delta)+M\delta}$ otherwise	0	1 if $\delta < \frac{9}{9+M}$ $\frac{18(1-\delta)}{9(1-\delta)+M\delta}$ otherwise	$\frac{C-L}{9}$ if $\delta < \frac{9}{9+M}$ $-\frac{2(L-C)(1-\delta)}{9(1-\delta)+M\delta}$ otherwise
<i>LMC C-Dom</i>	$\frac{C\delta-9(1-\delta)}{9-L\delta}$ if $\delta < \frac{9}{9+C}$ $\frac{9(1-\delta)-C\delta}{9(1-\delta)+C\delta}$ otherwise	0 if $\delta < \frac{9}{9+C}$ $\frac{9(1-\delta)-C\delta}{9(1-\delta)+C\delta}$ otherwise	1	$\frac{C-L(1-\delta)}{9-L\delta}$ if $\delta < \frac{9}{9+L}$ $-\frac{(9-C)(1-\delta)-C}{9(1-\delta)+C\delta}$ otherwise
<i>5 Trilateral Balanced Dispositional Coalition</i>				
<i>LMC</i>	-1 if $\delta < \frac{9}{9+M}$ $-\frac{18(1-\delta)}{9(1-\delta)+M\delta}$ otherwise	0	1 if $\delta < \frac{9}{9+M}$ $\frac{18(1-\delta)}{9(1-\delta)+M\delta}$ otherwise	$\frac{C-L}{9}$ if $\delta < \frac{9}{9+M}$ $\frac{2(C-L)(1-\delta)}{9(1-\delta)+M\delta}$ otherwise

Table 1: Equilibrium Proposals and Expected Policy in All Varieties of Dispositional Coalition

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Notes

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¹Some independent regulatory agencies employ procedures modeled on those of the U.S. Supreme Court. More generally, appellate procedures differ dramatically across legal systems. English courts, for example, follow a *seriatim* practice in which each judge announces her own dispositional vote and reasons for it. The French Cour de Cassation, by contrast, uses a *per curiam* practice in which the court announces a single, unsigned, ostensibly unanimous opinion. For a more general discussion, see Kornhauser 2008

²Much of the prior literature focuses exclusively on either the disposition, as in Fischman 2008 and Fischman 2011 or Iaryczower and Shum 2012, or on policy as in Spiller and Spitzer 1995, Hammond et al 2005, Bonneau et al 2007, and Jacobi 2009. In Lax 2007, courts make policy case by case so dispositions have primacy though the paper does consider the relation between the court's emergent policy and the announced rules of each judge as well as a game in which judges announce rules rather than policies. Carrubba et al 2012 and Cameron and Kornhauser 2008 model appellate decisionmaking as a joint product.

³The models in both Carrubba et al 2012 and Cameron and Kornhauser 2008 recognize that the electorate over the disposition may differ from the electorate over policy. Neither, however, requires that a majority of the court endorse an opinion; indeed, in each model, no such majority opinion will exist for a broad class of parameter values.

⁴For a description, see e.g., Epstein and Knight. Prior models of the bargaining process either permit only limited opinion competition, as in Lax and Cameron 2007 (where only

two opinions compete) or Cameron and Kornhauser 2008 (a monopoly author model), or they do not model opinion competition explicitly, as in Carrubba et al 2012.

⁵Cameron and Kornhauser 2008 permit strategic dispositional votes while Carrubba et al 2012 focus attention on situations in which each judge casts a dispositionally sincere vote. Fischman 2008 and Fischman 2011 also permit strategic dispositional votes, however as noted above judges do not make policy in this model.

⁶As we discuss at greater length below, when we limit a court to three blocks, there are 55 distinct 9-judge courts. Only 10 of these occur on a three-judge court: they correspond to the following: $\{9,0,0\}$, $\{0,9,0\}$, $\{0,0,9\}$, $\{6, 3, 0\}$, $\{6,0,3\}$, $\{3,6,0\}$, $\{3,0,6\}$, $\{0,6,3\}$, $\{0,3,6\}$, and $\{3,3,3\}$.

⁷Some recent work on scaling votes of Supreme Court justices suggests that too much precision in a estimating ideal points is probably illusory in any event (Clark and Lauderdale 2010).

⁸Using a data set of immigration decisions concerning asylum and a theoretical model in which judges on a three-judge panel decide only the disposition, Fischman 2008 estimates that at least one judge votes strategically in 45% of the cases and two judges vote strategically in 8% of the cases.

⁹As indicated in the text, judicial rules partition the case space into two sets, in one set of which defendant is responsible and in the other of which he is not. Statutes, however, often partition the case (or fact) space into many sets. The Internal Revenue Code, for example, partitions the fact space into sets that correspond to amounts of tax owed.

¹⁰One might characterize negligence rules in this way. Here the fact space consists only of the care \hat{x} that an agent takes. The legal rule is defined by the standard of care x . An agent is negligent if and only if $\hat{x} < x$.

¹¹Cameron and Kornhauser 2008 treats the utility of casting join vs concur votes as expressive; in contrast, here the value of such votes comes from the policy resulting from votes.

¹²This normalization is not wholly innocuous.

¹³If there are m blocks, unanimous dispositions require simultaneously solving $m - 1$

equations; dispositions that are one judge less than unanimous require simultaneously solving $m - 2$ equations; and so. The computational advantage of treating a court as composed of three ideological blocks becomes clear.

¹⁴The figure utilizes the results numbered 5-10 in Appendix 1.

¹⁵In the median judge and the majority median models, by contrast, the announced rule depends only on the ideal point of the median judge or the median judge in the dispositional majority.

¹⁶In this conclusion we focus on the difference between the sequential bargaining model and median judge and the majority median models. Earlier we also discussed how the sequential bargaining model differs from the extended monopoly author model, even when we assume that assignment probabilities correspond to the two models.

Specifically, we showed that the monopoly author model and the sequential bargaining model under sincere dispositional voting coincided when δ was sufficiently small so that each block adopted an accommodationist strategy. When δ is large, by contrast, the two models may yield different predictions.

Note, moreover, that when a block votes strategically on the disposition, the two models yield different outcomes even when δ is small.

¹⁷This would make the timing of the game: phase 1—dispositional vote; phase 2—the initial assignment of the opinion by the senior justice in the majority, phase 3 – the assigned author submits an opinion that either attracts at least 5 joins or not. phase 4—if the opinion does not attract five joins, there is random assignment for a second author.

We have not fully analyzed this game. It is clear that, in phase 4, the assigned author will make the offer specified in our equilibrium given the voting bloc sizes and discount factor. The senior justice thus has an incentive to assign to the block that will produce an opinion most favorable to her block.

Assignment power thus gives a justice an incentive to be in the dispositional majority. As the Chief Justice is, *ex officio*, the most senior member on the Court, he always has an

incentive to vote for the dispositional majority.