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CERTIORARI AND COMPLIANCE IN THE JUDICIAL HIERARCHY

DISCRETION, REPUTATION AND THE RULE OF FOUR

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ABSTRACT

I develop a formal model of the interaction between auditing by the Supreme Court (certiorari) and compliance by the lower courts, presenting three challenges to the existing literature. First, I show that even discretionary certiorari (the Court can choose which cases to hear) only goes so far in inducing compliance. Second, the literature often treats the Court as a unitary actor, ignoring the Rule of Four (only four votes are needed to grant certiorari). This rule is generally assumed to limit majoritarian dominance – this is a puzzle given that the rule itself is subject to majority control. I show that it actually increases majority power by increasing lower court compliance. Finally, while sincere behavior is often taken for granted at the Supreme Court level, I show that potential non-compliance creates heretofore unrecognized incentives for the justices to conceal their true preferences, so as to induce greater compliance. They can exploit even minimal uncertainty to manipulate asymmetric information in a signaling game of strategic reputation building, further increasing compliance under the Rule of Four.

KEY WORDS • compliance • hierarchy • rules • reputation • Supreme Court

Certiorari and Compliance

The justices of the Supreme Court decide for themselves whether to grant certiorari (cert): they can review a lower court decision or let it stand. Given the increasing caseload, the discretionary docket has become one of the key weapons in the fight to compel compliance in the judicial hierarchy,

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allowing the justices themselves to determine which battles to fight with the lower courts. As Cameron et al. (2000) point out, certiorari and compliance have both received much scholarly attention – but with little recognition of their interdependent incentives.

In this article, I develop a formal model of the judicial hierarchy that advances our understanding of this interaction, while incorporating legal concepts such as case facts and legal doctrines and theoretical concepts such as decision costs, endogenous institutions and incomplete information/reputation, along with judicial attitudes and culture. This model presents three challenges to the existing literature:

- While the literature argues that discretionary certiorari allows the Court to overcome its workload issues and stay current, I show that even discretionary certiorari only goes so far in inducing lower court compliance.
- The literature often treats the Court as a unitary actor, ignoring the Rule of Four (the rule that a minority of four justices is sufficient to hear a case). Indeed, no formal model of the Rule of Four has ever been published. It is widely assumed that this rule limits majoritarian dominance of the agenda – which is a puzzle given that the existence of the rule itself is subject to majority control. I show, however, that the Rule of Four actually increases majority power by increasing lower court compliance. What is counter-majoritarian in appearance is majoritarian in effect. In fact, the Rule of Four is pareto superior to a majority Rule of Five and often preferable to smaller cert rules.
- While sincere behavior is often taken for granted at the Supreme Court level, I show that potential non-compliance creates heretofore unrecognized incentives for the justices to conceal their true preferences, so as to induce greater compliance. They can exploit even minimal uncertainty to manipulate asymmetric information in a signaling game of strategic reputation building. Moreover, the Rule of Four makes it easier for them to do so and to achieve full compliance thereby.

This article is organized as follows. In the next section, I develop a model of the judicial hierarchy that captures its inherent principal–agent problem. The following section demonstrates the effects of the Rule of Four. I then extend the basic model to deal with reputation and the Rule of Four. The final section concludes. Throughout, I draw comparisons to another model of the judicial hierarchy, the informational model of Cameron et al. (2000) (hereafter, CSS), in which the same strategic effects exist but go unrecognized by the authors. Proofs are contained in the Appendix.

Discretion and Compliance

Discretionary certiorari is an institution of relatively recent vintage.[1] Congress granted the Court limited discretionary review in 1891 and much greater discretion in the Certiorari Act of 1925. Today, the Court's jurisdiction is almost completely discretionary. While this enables the justices to police lower court decisions better by concentrating their limited time and resources on those cases that they consider most important,[2] it also means that the lower courts know that review of their decisions is not automatic.

To be sure, actual review is not required, as the mere threat of review can induce anticipatory compliance. That said, given auditing costs and the constraints of finite resources,[3] the justices cannot credibly threaten to review all non-compliant decisions. 'Deciding to decide' (in Perry's phrase) will be done in the context of these costs and constraints.[4] In short, the Supreme Court faces a principal–agent problem. In this view, the judicial hierarchy is the institutionalization of the battle to impose one's view of the law on others, with the principals (the higher courts) seeking compliance by agents (the lower courts). Certiorari is the response to non-compliance; compliance is the anticipatory response to certiorari.

Even under mandatory review of all cases, the Court would have to allocate its limited attention (leading to imperfect auditing at the decision stage instead of the certiorari stage). Discretionary review thus clarifies what mandatory review would obscure – the balancing of costs and benefits in decisions to audit lower court decisions. This clarity may institutionalize the high court's allocation of resources but it also institutionalizes the lower courts' calculus of compliance.[5]

Modeling Discretion and Compliance

The structure of the basic model is as follows (throughout, I use search-and-seizure cases as a contextual example, as in CSS). There is a lower court, L,

1. It is also quite rare. The Supreme Court of Canada also has some control over its own docket, with leaves to appeal granted by sets of three of the nine justices arranged by the chief justice.

2. There is 'powerful evidence' of error correction as a goal in choosing cases (see Baum, 1997: 79), despite the protestations of the justices themselves (see Perry, 1991: 36).

3. These resources include the clerks. While clerks reduce the personal burdens on the justices, the time and effort of clerks are themselves scarce resources given the intense workload.

4. These costs can be institutional (the time, effort and opportunity costs of hearing a case) or political (such as conflict with other political actors). For discussions of 'dispute avoidance', see Epstein and Knight (1998: 83) and Provine (1980: 54–62).

5. Non-compliance need not be outright defiance, which is rare, as noted by Segal and Spaeth (1993) but can simply be avoidance of high court preferences on the margins.

and a higher court, H, each, in turn, deciding a case. Each court has its own preferred legal doctrine which sorts cases dichotomously into equivalence classes (e.g. admitting a search or excluding it as 'unconstitutional') (see Kornhauser, 1992). The question is whether the lower court will decide the case according to H's legal doctrine (compliance) or, if the two differ, its own (non-compliance). The lower court can comply ($l = c$) or not comply ($l = \bar{c}$). The higher court can then grant cert ($h = g$) or deny cert ($h = \bar{g}$). Once cert is granted, the case is decided (evidence is included or excluded) as per H's doctrinal preferences. The lower court is reversed (for non-compliance) or affirmed (for compliance).

Each case – each set of facts – corresponds to a point in a multidimensional fact space, which, in turn, corresponds to a point x in a one-dimensional issue or 'attitude' space X (e.g. how 'intrusive' the search is vis-a-vis the probable cause).[6] CSS models preferences by dividing cases into two sets, admissible and inadmissible, divided by a cut point in X. This treats all cases the same. Every 'correct' ('incorrect') answer is worth the same as any other 'correct' ('incorrect') answer. To be sure, this simplification has the paired virtues of parsimony and tractability, yet it also obscures important aspects of decision-making. Some decisions are simply more compelling than others, while other cases are too close to call, so that a justice is effectively indifferent between outcomes. Consider a case in which the police resort to means just short of torture to uncover evidence – certainly the answer in this case is likely to be more compelling than a middle-of-the-road case.

Thus, instead of modeling preferences with a cut point, consider an indifference point. The farther away the case is from the indifference point, the clearer the correct answer is – and the more important getting this correct answer is. The utility of case outcomes depends on how distant the case is from one's indifference point. A case located at the indifference point will yield no outcome-based utility one way or the other but cases at the extremes will be the most painful to lose and the most important to win.

H has an indifference point x_H in X such that it wants the evidence excluded in any search more intrusive than x_H and admitted in any search less intrusive than x_H, with indifference at x_H itself. A more 'liberal' court will want to see fewer searches admitted and thus have an indifference point farther to the left than a 'conservative' court. If a case is decided correctly, the higher court receives $+|x_H - x|$, and otherwise 0. L has a similar indifference point at x_L. (A sample configuration is shown in Figure 1.) The lower court can comply with the higher court by complying with its legal doctrine (deciding all cases as per x_H) or it can follow its own preferred doctrine.

6. This is the 'attitude' space of the attitudinal model of judicial behavior (Segal and Spaeth, 1993).

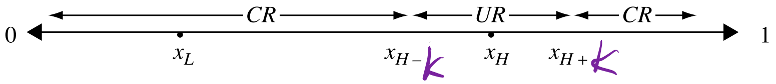

Figure 1. The Basic Model

There are two final parameters. First, there is an auditing cost, $k > 0$, for each case heard by the high court: 'this auditing cost reflects the time and effort of hearing the case, which involves a cost in other cases unheard and in leisure and other activities foregone' (CSS: 104).[7] The lower court, with no autonomy over its docket, faces no relevant auditing costs.[8] There is, however, a reversal penalty of $\varepsilon > 0$.[9] In the basic model, I assume complete information. To simplify discussions, let $x_L < x_H - k$, so that the lower court is relatively more liberal than the higher court.[10]

A strategy for L is a function

$$s_L\colon X \to \Delta(\{c, \bar{c}\})$$

where $\Delta(\cdot)$ denotes the set of probability distributions over the discrete action set. For every case x in X, $s_L(x)$ gives the probability that L complies. H's strategy will be a function

$$s_H\colon l \times X \to \Delta(\{g, \bar{g}\})$$

For every case x in X, and given the decision, l, of the lower court, $s_H(l; x)$ is the probability that H grants cert. I suppress the functional inputs, so that the strategies are denoted s_L and s_H.

The utility functions are as follows:

7. Part of this could be made endogenous, a measure of the tradeoff induced by a budget constraint or as a function of docket size. For instance, suppose that H can hear either the current case or a future case. Then, the cost of hearing the first case can be seen as the expected opportunity cost of not hearing the second case, which would be drawn from some probability distribution. (I owe this example to a discussion with John Duggan.) This would not add anything to this model, however.

8. Obviously, hearing a case does consume time and resources but, since the lower court cannot deny cases, this is a fixed cost in its decision-making calculus.

9. As in CSS, this cost is exogenous to the model, assumed to be part of judicial culture and maintained through sanctions over repeated play in the legal community and the judicial hierarchy.

10. Results are symmetric.

$$u_L = \begin{cases} |x_L - x| & \text{if } \begin{cases} x \leq x_L, l = c \\ x_L < x < x_H, l = \bar{c}, h = \bar{g} \\ x \geq x_H, l = c \end{cases} \\ |x_L - x| - \varepsilon & \text{if } \begin{cases} x \leq x_L, l = \bar{c}, h = g \\ x \geq x_H, l = \bar{c}, h = g \end{cases} \\ 0 & \text{if } \begin{cases} x \leq x_L, l = \bar{c}, h = \bar{g} \\ x_L < x < x_H, l = c \\ x \geq x_H, l = \bar{c}, h = \bar{g} \end{cases} \\ -\varepsilon & \text{if } \{ x_L < x < x_H, l = \bar{c}, h = g \end{cases}$$

$$u_H = \begin{cases} |x_H - x| & \text{if } \begin{cases} x \leq x_H, l = c, h = \bar{g} \\ x \geq x_H, l = c, h = \bar{g} \end{cases} \\ |x_H - x| - k & \text{if } \{ h = g \\ 0 & \text{if } \begin{cases} x < x_H, l = \bar{c}, h = \bar{g} \\ x > x_H, l = \bar{c}, h = \bar{g} \end{cases} \end{cases}$$

Proposition 1: The subgame-perfect Nash equilibrium of this game is as follows:[11]

$$s_L^* = \begin{cases} 0 & \text{if } x_H - k < x < x_H \\ 1 & \text{otherwise} \end{cases}$$

$$s_H^* = \begin{cases} 0 & \text{if } \begin{cases} l = c \\ l = \bar{c}, (x_H - k) < x < (x_H + k) \end{cases} \\ 1 & \text{otherwise} \end{cases}$$

The higher court will, of course, only audit when the benefit from correcting a decision below is larger than the auditing cost; otherwise, it will let lower court 'errors' stand. Auditing never actually occurs in the basic game – the threat of auditing is sufficient to establish H's (partial) control.[12] There is a window around x_H of radius k within which it does not pay to

11. There is a trivial variation given indifference at $(x_H - k)$.

12. Auditing still occurs with positive probability in equilibrium in the incomplete information model presented later (and in CSS).

grant cert even if the higher court disagrees with the lower court – the cost of granting cert outweighs the policy benefits of imposing the preferred decision. Call this the uncertworthy region (*UR*), the region of non-compliance; the certworthy regions to either side are the regions of compliance (see Figure 1).

Cases between $(x_H - k)$ and x_H are decided according to *L*'s doctrinal preferences, not *H*'s, but cert is still denied.[13] The greater the costs of review become, the stronger the constraints on higher court dominance, and the larger the region of non-compliance.[14] In the search-and-seizure example, all searches with $x < (x_H - k)$ are admitted. This is a more liberal legal 'policy' than the high court would prefer.[15]

In CSS, cases are not weighted in the utility function by their position – but they are effectively weighted by the high court's uncertainty as to their position. The effect is largely the same, however: there is a window of non-compliance surrounding the median's position.[16] The lower courts can shirk the high court's legal doctrine to an extent based on their relative ideologies, institutional features and the norms of judicial culture. This is implicit in the results but the implications for strategic behavior in the high court are not recognized, the focus of the model being signaling behavior by the lower courts.

The Rule of Four and Compliance

Justice Brennan used to grill his clerks as to the most important rule in the Court, his answer being 'it takes five votes to do anything in the Supreme Court' (Savage, 1993: 12). But there is one place where Brennan's 'Rule of Five' is supplanted by a Rule of Four – it only takes four votes for certiorari to get a case heard by the Supreme Court.

Although the Rule of Four (R4) dates at least as far back as 1924,[17] the literature often treats the Court as a unitary player typically represented as

13. Note that the justices themselves point out that cert denials do not mean agreement with the lower court's decision (Perry, 1991: 38).

14. When the cost of hearing a case in a given issue area is relatively high (a difficult or unimportant case), the uncertworthy region is larger.

15. Failing to account for this effect, and judging judicial ideology from case outcomes alone, we would underestimate the Supreme Court's conservatism by k (a similar result holds for CSS).

16. Some cases are uncertworthy given the relatively small chance that they were actually incorrectly decided, and if a decision will seem sufficiently acceptable to the high court, the lower court, knowing the true facts of the case, can get away with non-compliance.

17. Its origins and early history a mystery, it became public knowledge in 1924 in discussions before the Senate Committee on the Judiciary in 1924 (Provine, 1980: 33), but was likely in existence before this. Justice Stevens (1983: 10) dates it as circa 1917; other work places it decades earlier (Leiman, 1957).

its median member. I show that doing so conceals important aspects of the certiorari–compliance interaction. R4 has significant effects on lower court compliance, thus extending to the lower courts Epstein and Knight's (1998: 121) observation that 'the Rule of Four invites forward thinking'.[18]

R4 is usually portrayed as countermajoritarian, preventing tyranny by the majority over the agenda (e.g. Brennan, 1986; Perry, 1991). What is forgotten in such explanations is that the rule itself was created by the justices of the Court.[19] A majority of justices could have abolished it long ago (Stevens, 1983).[20] If the rule truly reduced majority power, a majority of justices surely would have done so[21] – as institutional rules are themselves 'remote majoritarian choices', as per the Majoritarian Postulate (Krehbiel, 1991).

In this light, the procedures by which the Court makes its decisions are endogenous, part of an extended decision-making process. Explanations of institutional rules that rely on generosity to minorities must therefore be viewed with skepticism. We should not expect such institutions to change day by day. It is, however, highly unlikely that majorities of justices would have sustained an adverse rule for over seven decades. Institutional rules might be 'sticky' in that there are transaction costs to changing them but surely these costs would have been overcome by now.

I show in this section that there is a much firmer foundation for R4 than simple altruism, one arising solely from the self-interest of the justices. I show that this rule increases the power of the median justice by increasing lower court compliance with her/his preferred legal doctrine. Ironically, it strengthens the median justice by reducing her/his pivotal power. What is more, with respect to all nine justices, R4 is generally pareto superior to a majority Rule of Five (R5). These counterintuitive effects thus sustain R4 under the Majoritarian Postulate.

18. There is a literature (see Baum, 1997: 79–80) on the degree to which the justices engage in outcome prediction, looking ahead to the final vote in deciding whether to grant cert in a case. The justices seem to be more careful when they want to avoid allowing a favorable lower court decision to be overturned.

19. Note the title of Justice Stevens's 1982 speech discussing the Rule of Four: 'The Life Span of a Judge-Made Rule' (Stevens, 1983).

20. Justice Van Devanter suggested that the justices were committed to the rule, because it was used to argue in favor of the Certiorari Act (Leiman, 1957: 981); Justice Marshall argued similarly with respect to the congressional–judicial battles of the 1930s (Epstein and Knight, 1998: 86). Justice Stevens (1983: 14) argues, however, that this does not estop the justices from changing the rule, noting that other contemporaneous rules have been changed. In fact, the cert rule is the only 'promise' that has been honored ('The Supreme Court and certiorari').

21. One would otherwise have to assume altruistic behavior or a complex inter-temporal bargain driven by the fear that one might later be in the minority along with some benefit from getting cases one will lose anyway onto the agenda.

Modeling the Rule of Four and Compliance

Let the justices be numbered from left to right, with indifference points x_{H_1} through x_{H_9}. These indifference points induce uncertworthy regions UR_1 through UR_9, each a region of radius k in which that justice will not vote to audit lower court decisions. A case that is uncertworthy to one can be certworthy to others.[22] (See Figure 2.) The median M (with indifference point x_{H_5}) may be the decisive voter on the merits but the key question is what the overall uncertworthy region is, the region in which no four justices will vote for cert and in which non-compliance will be tolerated. Under R4, it is the pair of justices adjacent to the median that are pivotal in the cert decision – call these the liberal and conservative cert pivots, C_L and C_C respectively, with indifference points x_{H_4} and x_{H_6}.

Consider a liberal lower court deciding a case $x < x_{H_5}$. If L excludes, M and C_C will both think the decision erroneous but if the case is in the intersection of their individual URs, neither would grant cert. Outside this intersection, however – where the case falls into UR_5 but not UR_6 – there are four votes for cert, leading to a conservative outcome (with at least five merits votes). Anticipating this, the lower court will comply with the median's doctrine even though the median her/himself would not vote to grant cert.[23]

Under R5, the Court cannot credibly commit to reversing a lower court decision in this region. Under R4, the Court can, which induces anticipatory compliance. The justices adjacent to the median justice, the cert pivots, are the key to lower court compliance, with C_C holding back liberal lower court non-compliance and C_L conservative lower court non-compliance.

Let $\overline{UR}(v)$ be the uncertworthy region of the Court as a whole under a Rule of v. Then, the following holds:

Proposition 2:

For $1 \leq v \leq 5$, $\overline{UR}(v) = \{x | x_{H_{10-v}} - k < x \leq x_{H_5} + k\} \cup \{x | x_{H_5} \leq x < x_{H_v} + k\}$

The bounds of $\overline{UR}$, around the median, are determined by k and the positions of the cert pivots (identified as per the cert rule). It is clear that $\overline{UR}(4)$ is weakly smaller than $\overline{UR}(5)$, as in Figure 2.

22. This is true even without a spatial setting – so long as the valuations of cases differ among the justices, this explanation of R4 is robust.

23. Justice Stevens (1983: 17) is right, in a way, that the cases with only four cert votes are less important – they are surely insufficiently important to the median voter. But he is incorrect that 'logic . . . support[s] the conclusion that the Rule of Four must inevitably enlarge the size of the Court's argument docket' (p. 20) – this ignores the power of anticipatory behavior.

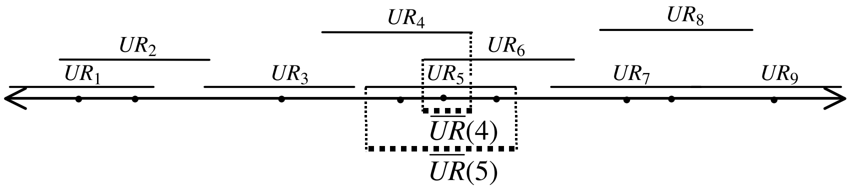

Figure 2. The Rule of Four

Lower courts will comply outside of this region but one problem remains. Let the left half of $\overline{UR}$ be denoted $\overline{UR}^L$ and the right half $\overline{UR}^C$. Preventing non-compliance in $\overline{UR}^L$ by liberal lower courts is great for conservative justices – but they also benefit from the non-compliance by conservative lower courts in $\overline{UR}^C$. Similarly, the liberal justices favor reigning in the conservative lower courts but not the liberal lower courts with whom they agree. There is therefore a tradeoff between the compliance they desire and the non-compliance they desire.

This tradeoff, however, is in the best interests of all of the justices. For the conservative justices, the cases in $\overline{UR}^C$ are closer to their indifference points, those in $\overline{UR}^L$ farther away. The former are worth less than the latter by definition. The symmetric argument holds for the liberal justices. R4 is thus pareto superior to R5 in terms of the outcomes they each induce. We thus need not be surprised by this sub-majority cert rule.[24]

In fact, why stop there? In Figure 2's configuration, $\overline{UR}(3)$ would be the null set. The relative sizes of the overall uncertworthy regions are as follows:

Corollary 2.1: If $1 \leq \nu < \mu \leq 5$, $|\overline{UR}(\nu)| \leq |\overline{UR}(\mu)|$

The smaller the cert rule is, the weakly smaller the region of non-compliance becomes. This begs questions as to why the Supreme Court does

24. R4 will not reduce the uncertworthy region implicit in CSS as it stands. Given its simplification of preferences, cases are equally weighted by the justices by the probability that the median truly wants to reverse. The argument for R4 here depends on valuations that differ across justices. Were the CSS model to include nuanced judicial preferences, the R4 would increase compliance there as well. (Nuanced preferences would also narrow down the family of equilibria presented in CSS.)

not use a Rule of Three, Two or even One.[25] A possible answer is that a smaller cert rule would be too subject to abuse, allowing ever smaller minorities to overload the Court's docket. R4 is subject to abuse[26]; R1 could very easily be abused.

A more formal answer is that each succeeding shift to a smaller cert rule is only *weakly* pareto superior. In fact, there are only benefits to a smaller cert rule (in terms of a smaller $\overline{UR}$) if the auditing cost is sufficiently high compared to the distance between justices. Consider an equidistant distribution of the nine justices, with indifference points ranging from 0 to 1. The size of the $\overline{UR}$ for different cert rules and values of k are shown in Figure 3. For any positive value of k, R4 is ~~strictly~~ pareto superior to R5 – but R3 is only superior to R4 if $k > .125$ (that is, if k is greater than the distance from the median to either of the two adjacent justices). R2 is only superior to R3 if $k > .25$, and R1 is only superior to R2 if $k > .375$.[27]

strictly if $k < .5$

Similarly, for a fixed value of k, the lower courts are fully compliant if the cert pivots are farther than k away from the median. R4 is strictly superior to R5 so long as the middle three indifference points are not identical; but it only pays to move to R3 if the fourth and sixth justices tend to be within k of the median and the next outer pair tend not to be.

If there is any cost or danger whatsoever in moving to a smaller cert rule, then there are conditions under which R4 is optimal. R5 never is (given $k > 0$). Whether R4 would be superior to other minority cert rules in reality would – without one final argument – remain an empirical question. This final argument must wait for the section on reputation.

25. Of course, the key puzzle is why the justices would support *any* non-majoritarian rule. The prior explanation, that the justices want to avoid majoritarian tyranny, cannot itself explain why four is the magic number.

26. Lazarus (1999) recounts such abuse by liberal justices in the 1980s with respect to death penalty cases. The majority fought back by threatening to raise the cert threshold to five votes for these cases. Technically, the majority need not ever hear a case in full if it does not wish to, as with five votes it can dismiss it as improvidently granted ('dig'). This does not undercut R4 as a commitment device, however, as the 'dig' is only used when fewer than four of the original cert voters still want to hear the case (see, for example, Woodward and Armstrong's (1979) account of the debate in *Burrell v. McCray* (1976) and Justice Brennan's and Justice Steven's opinions therein). (Given the argument in the next section, the median also might not want to 'dig' a case granted by four cert voters, as this would reveal too much about her/his indifference point.) The Court's 'Rule of Six' (six votes are required for summary disposition of a case with an opinion *per curiam*) also helps to stem minority abuse of cert, as a sufficient majority can prevent further investment of resources. Each of these restrictions prevents the median from undercutting the cert pivots.

27. I owe this example to a discussion with Gary Cox.

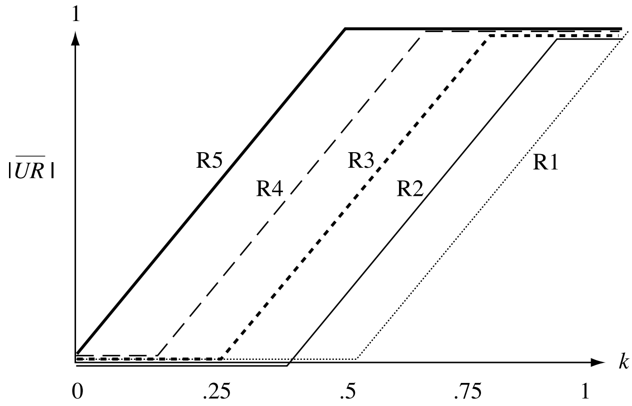

Figure 3. Cert Rules and the Uncertworthy Region

Other Explanations for the Rule of Four

The Majoritarian Postulate undercuts an explanation for R4 based on concern for the interests of the minority. An unpublished paper by Schwartz (1993) offers another explanation, based on asymmetric information. In that model, there is uncertainty over the policy effects of decisions which is costly to dispel – except for the justice who is a known expert in the relevant issue. The median might not know her/himself whether s/he truly wants to grant cert, but s/he can use the expert's cert vote to find out. R4, Schwartz argues, can make the expert pivotal, so that the median benefits from the expert's free information.

There is, however, no need to resort to a non-majoritarian cert rule to achieve this result. Instead, the median can simply match the expert's vote – or s/he can just ask him/her about the case as necessary. Even under R5, this would still make the expert pivotal, and s/he would still have the proper incentive to vote sincerely at the cert stage, revealing the same information. The informational pressure for R4 is thus an artifact of assuming a secret simultaneous cert vote (in reality, the process is far more flexible, with justices free to change their votes).[28]

28. There is similarly no reason to resort to R4 if the median simply wants more time or information given uncertainty about the lower court's behavior (say, as in CSS): s/he can just vote to grant cert her/himself in these circumstances or have the case held over.

Schwartz's theory also cannot explain the exact choice of R4 (of course, neither can the minority-indulgence theory).[29] While insufficient for R4, however, Schwartz's argument might explain the 'join 3', whereby a justice votes for cert conditional on the votes of at least three other justices, allowing each of them to be pivotal. Under R5, a justice could achieve the goal that Schwartz posits with a 'join 4', without having to give up any power for other cases.

Reputation and Compliance

The attitudinal model argues that the lack of constraints at the Supreme Court level allows the justices to express their preferences sincerely in the final vote on the merits (Segal and Spaeth, 1993) – but this qualification is often glossed over in the literature. Moreover, this ignores the role of incomplete information. Simple backward induction may show that sincere voting is equilibrium behavior in the final stage of the game – but no Supreme Court action is truly the final stage. There are always new cases and new decisions.[30] The pressure of future cases, combined with the Court's compliance problem, creates incentives for the justices to hide their true preferences and engage in strategic reputation building.[31]

As noted in Cameron (2000: 107), 'reputation *is* the beliefs that others have about your incompletely known characteristic. Those beliefs affect others' actions. Moreover, in a dynamic strategic setting, their beliefs will

29. Depending on the positions of the median and the expert, any cert rule might be optimal for a given case, with some justices preferring One and others Nine. Four is not optimal simply because it has been in use 'for a very long time' or because it seems right 'on average' (Schwartz, 1993: 26–7). In Schwartz's model, R4 is only better than R5 under two assumptions: that the expert and the median are more likely to fall into specific ideological positions; or that regret over not having granted cert is worse than regret over having granted cert (and even then a smaller cert rule might be optimal). In this model, if information costs are low, R5 is better.

30. While the literature has considered future reactions by other branches of government (e.g. Segal, 1997; and see Baum, 1997: 93), it has not explored the informational aspects of these relationships nor has it considered future reactions within the judicial branch itself.

31. The notion that the justices might wish to obscure their positions might strike some as implausible at first glance, yet there are some rather striking examples of the justices doing just that. The justices fought in decades of desegregation cases beginning with *Brown v. Board of Education* and in the Watergate tapes case to produce unanimous decisions without revealing fault lines in the Court (see Lax, 2001). The move, under Chief Justice Marshall, from offering opinions seriatim to a joint opinion of the Court also serves to hide the breakdown of judicial preferences (so too does the judicial norm of avoiding unnecessary dissents or separate concurrences). To be sure, Supreme Court justices are well known and often serve for extended periods of time but there remains much uncertainty as to their exact positions across multitudes of issues.

evolve in response to your observed actions.'[32] In this section, I incorporate reputation into the model and show that cert decisions are part of such a dynamic strategic setting, with even minimal uncertainty allowing for full compliance under the Rule of Four given a sufficiently long time horizon. Though I focus on cert decisions, the setup could be extended to deal with other aspects of judicial behavior.[33]

Incentives for Strategic Behavior

In the basic setup, there is a shortfall in Supreme Court control, given the uncertworthy region of the median voter. If, however, the median were thought to be k more conservative, then even given this shortfall, the lower court would be fully compliant (see Figure 1). There is thus an incentive to appear more extreme as compensation for this effect.[34]

To be sure, there is a potential problem: if the median were to appear more extreme to the liberal lower courts, increasing compliance from that side, s/he would mislead conservative lower courts into costly non-compliance (they would incorrectly believe that the uncertworthy region extended closer to them). Increased compliance from one side would have to be balanced against the increased non-compliance from the other. This tradeoff will only be favorable when the lower courts are not symmetrically distributed about the high court.[35]

Given R4, however, no such tradeoff is necessary. Compliance by liberal lower courts depends on the conservative cert pivot; compliance by conserva-

32. There is no uncertainty about preferences in CSS but some uncertainty is necessary for it to be consistent with other work by Cameron, Segal and Songer. In CSS, the higher court cannot tell with certainty whether the lower court has been compliant, given that the latter has private information about case facts (this is the driving force of the CSS signaling game). The litigants, however, will themselves know the facts. If rational, they will undertake a costly appeal when the case was indeed 'incorrectly' decided and when the appeal will bring victory, an empirical result in Songer et al. (1994, 1995). Rational litigants thus serve to screen lower court decisions, revealing information through their very decisions to appeal, leaving no uncertainty as to facts by the time cases reach the Supreme Court. The rational-litigant result thus undercuts the foundation of the CSS model – unless there is also uncertainty as to preferences that prevents such perfect anticipation by litigants.

33. To manipulate beliefs, a justice can use cert decisions, decisions on the merits or opinions. Opinions are the easiest to manipulate, and thus are the least credible signals. Decisions on the merits are far more credible, costly signals. Cert decisions fall in the middle – and since cert decisions are also the focus of the CSS paper, focusing on them makes it easier to relate the two models. Moreover, the possibility of signaling with cert decisions can make further signaling unnecessary.

34. This same incentive to be thought of as more extreme exists unnoticed in the CSS model.

35. A model of strategic behavior by the median justice was part of an earlier version of this project. Results were similar except that reputation building only took place in one direction.

tive lower courts depends on the liberal cert pivot. Two justices can do what one cannot – appear extreme in both directions simultaneously. This is yet another advantage of R4 (to which, again, a smaller cert rule would add nothing).[36]

For complete compliance, the cert pivots need not be outside of the median's uncertworthy region, so long as they are believed to be so – and beliefs will be based, in part, on the actions the justices take. They might be tempted to strike down a lower court, taking a stricter stance, so as to induce compliance in future cases through the fear of reversal.[37] Or, they might be tempted to explicitly affirm a lower court, so as underscore their stance and ensure compliance in future cases. Lower courts, meanwhile, knowing this incentive, have to judge the credibility of the Court's messages. This is, in game-theoretic terms, a signaling game.[38]

Modeling Reputation and Compliance

The model here will show that even if there is only a single future case, there are conditions under which the justices will strategically grant cert to a case that they would normally not hear, to reverse the lower court decision. If there is more than one relevant future case, there are also conditions under which they will grant cert just to affirm lower court decisions as well (unlike CSS, this need not take place only as a 'rational error').

To keep things tractable, consider two periods of play. In the first period (as in the basic game), a case x_1 is decided by a lower court L_1 with $x_{L_1} < (x_{H_5} - k)$ after which the high court decides whether to grant cert (this also serves as the potential signal).[39] In the second period, there are n cases at x_2, which is chosen from the uniform distribution between 0 and 1 (they may or may not wind up in the conflict region).[40] Each of these is

36. Although the justices on one side might want to reveal that the cert pivot on the other side is not truly extreme, they cannot credibly do so given their diametrically opposed interests.

37. There is a potential parallel here to McCarty (1997) on bargaining during the president's post-election 'honeymoon'.

38. While the CSS model might be called bottom-up signaling (with the lower court's decisions sending signals about case facts to the higher court), this is top-down signaling (with the high court's decisions sending signals about preferences to the lower courts). The models are complementary and theoretically could be combined to create a more complete picture of the judicial hierarchy – but the complexity would hide more than it would reveal.

39. At the same time, the liberal cert pivot will be playing a similar game against the conservative lower courts.

40. The results do not substantively differ if it is known how many cases will actually fall into the conflict region in the second period.

decided simultaneously by a second lower court, L_2, with $x_{L_2} = x_{L_1} = x_L$.[41] The high court – specifically, the cert pivot – then decides whether to grant cert for each of these. If cert is granted, the case is decided as per the median's legal doctrine. Each lower court only cares about the result in the case(s) that it itself handles.[42]

To formalize lower court beliefs, let the conservative cert pivot (C_C) be one of two types: either moderate (C_{Cm}, with the same indifference point as the median, $x_{H_6} = x_{H_5}$) or extreme (C_{Ce}, with an indifference point of $x_{H_6} = x_{H_5} + k$). Utility functions are as before given the respective indifference points. Compliance is still defined as per the median's indifference point. Although C_C knows its own type, the actions of L_1 and L_2 will depend on their beliefs as to C_C's type.[43] Let the initial belief that C_C is extreme be p_1 and the belief after the first case be p_2. The latter is determined by Bayes's rule given p_1 and the players' strategies and actions (thus the added incentive for C_C to audit the first case).[44] The players' strategies now are conditioned on p_1 and, for the high court, differentiated by type:

$$s_{L_1}: X_1 \rightarrow \Delta(\{c, \bar{c}\})$$

$$s_{C_{Cm}}: l_1 \times l_2 \times X_1 \times X_2 \rightarrow \Delta_1(\{g, \bar{g}\}),\ \Delta_2(\{g, \bar{g}\})$$

$$s_{C_{Ce}}: l_1 \times l_2 \times X_1 \times X_2 \rightarrow \Delta_1(\{g, \bar{g}\}),\ \Delta_2(\{g, \bar{g}\})$$

$$s_{L_2}: l_1 \times h_1 \times X_2 \rightarrow \Delta(\{c, \bar{c}\})$$

It is assumed that x_1 is in the region of conflict ($x_{H_5} - k < x \leq x_{H_5}$), otherwise play is as in the basic game. A lower court strategy s_L is the probability of compliance. A cert pivot strategy is the probability of granting cert (after compliance and non-compliance respectively) in each period.

41. Equivalently, each case could be chosen separately from this distribution and/or these could be n separate lower courts each hearing one case, acting simultaneously.

42. These assumptions prevent unnecessary complications such as the first lower court 'testing the waters' or layers of signaling by the higher court. Results are reasonably robust in structure to changes in these assumptions. A discount factor on future cases instead of a set number n of future cases, for example, just shifts the results. Both serve as a weight for future cases.

43. In an equivalent model, the incomplete information would be as to the cert cost rather than indifference point of the cert pivot. The cert pivot might care less or more about this issue area (larger or smaller uncertworthy regions). The model in this article would be the same as this one if the two possible cert cost values were k and 0.

44. Beliefs off the equilibrium path are restricted by the following assumptions: if 'grant' is observed out of equilibrium then the cert pivot is extreme; and if 'deny' is observed out of equilibrium then the cert pivot is moderate. An equilibrium without strategic affirmance can be supported by an off-path belief that affirmance is the result of a mistaken cert grant. Other equilibria can be supported by less reasonable beliefs.

PROPOSITION 3: The following is a perfect Bayesian equilibrium.[45]

$$s^*_{L_1} = \begin{cases} 1 & \text{if } p_1 \geq \bar{\bar{p}} \\ 0 & \text{otherwise} \end{cases}$$

$$s^*_{C_{Cm}} = \{\{\lambda_a, \lambda_r\}, \{0, 0\}\}$$

$$s^*_{C_{Ce}} = \{\{1^\dagger, 1\}, \{0, 1\}\} \quad \left({}^\dagger 0 \text{ if } n < \frac{1}{k}\right)$$

$$s^*_{L_2} = \begin{cases} 1 & \text{if} \begin{cases} l_1 = c, h_1 = g, \begin{cases} n < \dfrac{2}{k} \\ n \geq \dfrac{2}{k}, \begin{cases} p_1 \leq \bar{p}_a, x_2 \leq \bar{\bar{x}}_a \\ p_1 > \bar{p}_a, x_2 \leq \bar{\bar{x}} \end{cases} \end{cases} \\ l_1 = c, h_1 = \bar{g}, n < \dfrac{1}{k}, x_2 \leq \bar{\bar{x}} \\ l_1 = \bar{c}, h_1 = g, \begin{cases} x_1 > \bar{x} \\ x_1 \leq \bar{x}, \begin{cases} p_1 \leq \bar{p}_r, x_2 \leq \bar{\bar{x}}_r \\ p_1 > \bar{p}_r, x_2 \leq \bar{\bar{x}} \end{cases} \end{cases} \end{cases} \\ 0 & \text{otherwise} \end{cases}$$

with

$$\bar{x} = x_{H_5} - k + \frac{n}{2}k^2$$

$$\bar{\bar{x}} = x_L + \frac{p_1}{1 - p_1}\varepsilon$$

$$\bar{\bar{x}}_a = x_{H_5} - \sqrt{k^2 - \frac{2}{n}k} \quad \text{for } n \geq \frac{2}{k}$$

$$\bar{\bar{x}}_r = x_{H_5} - \sqrt{k^2 - \frac{2}{n}(k - (x_{H_5} - x_1))} \quad \text{for } x_1 \leq \bar{x}$$

$$\bar{p} = \frac{(x_1 - x_L)}{(x_1 - x_L + \varepsilon)} \quad \bar{p}_a = \frac{(\bar{\bar{x}}_a - x_L)}{(\bar{\bar{x}}_a - x_L + \varepsilon)} \quad \bar{p}_r = \frac{(\bar{\bar{x}}_r - x_L)}{(\bar{\bar{x}}_r - x_L + \varepsilon)}$$

$$\bar{\bar{p}} = \begin{cases} \bar{p}_r \bar{p} & \text{if } x_1 \leq \bar{x} \\ \bar{p} & \text{otherwise} \end{cases}$$

$$\lambda_a = \begin{cases} 0 & \text{if } n < \dfrac{2}{k} \\ \dfrac{\varepsilon p_1}{(1-p_1)(\bar{\bar{x}}_a - x_L)} & \text{if } n \geq \dfrac{2}{k}, p_1 \leq \bar{p}_a \\ 1 & \text{if } n \geq \dfrac{2}{k}, p_1 > \bar{p}_a \end{cases}$$

$$\lambda_r = \begin{cases} 0 & \text{if } x_1 > \bar{x} \\ \dfrac{\varepsilon p_1}{(1-p_1)(\bar{\bar{x}}_r - x_L)} & \text{if } x_1 \leq \bar{x}, p_1 \leq \bar{p}_r \\ 1 & \text{if } x_1 \leq \bar{x}, p_1 > \bar{p}_r \end{cases}$$

This equilibrium is more intuitive than it might seem (a numerical example is presented later). Both reversals and affirmances can occur (unlike in the basic models).[46] The lower courts comply if their expectation of reversal is high enough, given the strategies of the cert pivot types. The first lower court must deal with the added risk of its case being used for a strategic reversal by the moderate type (no one minds being affirmed, of course) – if too high, this risk is avoided by pre-emptive compliance in the first case.

If p_1 is low (the cert pivot is likely to be moderate), then the first lower court will risk non-compliance, making strategic reversal possible. If p_1 is higher, then the risk of strategic behavior is too great, and the initial lower court will pre-empt strategic reversal by complying, making strategic affirmance possible.[47] If p_1 is higher still, the first lower court would, of course, comply even without the threat of strategic behavior given the high chance of the extreme type.

The lower courts face a collective action problem. They are better off knowing the type of the high court but no one wants to be the one to get burned finding out. The more extreme L is (more liberal in this setup), the more likely initial non-compliance is: extreme lower courts have the most to lose, given that these cases are relatively farther away from their indifference points.[48]

45. It should be noted that sincere behavior is *not* an equilibrium: if only the extreme type reverses, then observing a cert grant guarantees the extreme type and complete compliance, so the moderate type will also reverse.

46. One contrast between this model and CSS is that here affirmances are aimed at future cases rather than being the result of a mistaken cert grant.

47. While even a single cert denial reveals the moderate cert pivot, pre-emptive compliance precludes this from happening.

48. This may explain the purportedly recalcitrant ninth circuit, whose relatively liberal judges are said to frequently prod the Supreme Court with non-compliant decisions.

The behavior of the cert pivot is more complicated, at least in the first period (in the second period, both types behave as in the basic model). Both types are better off if believed to be extreme. The extreme type always reverses non-compliant decisions (these cases are outside its uncert-worthy region). The moderate type can mimic this behavior. Even for small values of n, there is a range of cases, between $(x_{H_5} - k)$ and $\bar{x}$, in which the moderate type strategically reverses (probabilistically). Outside of this range, only the extreme type reverses. As n increases to $2/k$, this range of potential strategic reversal increases to cover the entire conflict region. At this value of n or higher, strategic affirmance becomes possible throughout the conflict region. The extreme type affirms to confirm its type so long as $n \geq 1/k$; the moderate type affirms (probabilistically) to mimic this behavior so long as $n \geq 2/k$.

The signal 'cert granted' (whether to reverse or admit) can be ambiguous, while the signal 'cert denied' is generally not so (at least for non-compliance), confirming the cert pivot's type as moderate. Compliance can increase or decrease over time, depending on how the signaling game plays out and what is revealed. In equilibrium, the second lower court responds to cert grants by complying in a given region of cases within the conflict region. The size of this compliance region takes into account the lower court's fear of reversal and, in equilibrium, keeps the cert pivot willing to signal with a mixed strategy (if p_1 is high enough, the moderate type signals with probability 1, behaving exactly like the extreme type). The moderate type weighs the costs of the cert grant signal against the likelihood that future cases will fall within the strategic compliance region.

There are differences in the response to reversals versus affirmances, for two reasons. First, reversal has the added benefit of correcting a lower court mistake, thus making the grant signal less costly and thus less convincing. Affirmances are hence taken more seriously by future lower courts and the resulting compliance region is larger.[49] Second, the compliance region does not depend on x_1 for affirmances but does for reversals. In fact, the compliance region is complete following affirmance when $n = 2/k$ but is only complete following reversal when both $n = 2/k$ and $x_1 = x_{H_5}$. For either affirmance or reversal, this range approaches zero as n increases. For reversal, the range also approaches zero as x_1 approaches $(x_{H_5} - k)$; cases farther from the indifference point make for less convincing signals (they are closer to justifying reversal in their own right).

Put differently, for any value of p_1, there is a range of values of x_1 which still receive perfect compliance, then a range of non-compliance with

49. This would suggest that affirmances might make better vehicles for settling circuit conflicts.

probabilistic reversal, then finally (for n insufficiently high) a range of non-compliance that goes unchallenged. These ranges are implicit in the previous equilibrium.

Example

Consider a numerical search-and seizure example. Let $x_L = 0$, $x_{H_5} = .8$, $\varepsilon = .2$, $k = .2$, $n = 11$, and $x_1 = .7$. In the basic game, the lower court would admit searches up to .6 if the cert pivot were known to be moderate and up to .8 (full compliance) if the cert pivot were known to be extreme (note that without R4, this would again only be .6). For these values, the signaling regions cover the entire conflict region. Consider three possible values of p_1, .5, .75 and .9. If $p_1 = .5$, then the first lower court effectively treats the cert pivot as moderate, risking non-compliance and excluding the search. If the cert pivot is extreme, s/he grants cert and reverses. If s/he is moderate, s/he still reverses approximately 31 percent of the time (if the first lower court had complied, then the extreme type would affirm and the moderate type would affirm 27 percent of the time). If the second lower court observes reversal, s/he admits searches up to .65 in the second period. If s/he observes a denial of cert, then the moderate type is revealed and only searches up to .6 are admitted.

For a value of $p_1 = .75$, however, it is not worth risking non-compliance in the first period. The initial lower court admits the search. The extreme type affirms and the moderate type does so 81 percent of the time (if the search had been excluded, the extreme type would have reversed and the moderate type would have done so 92 percent of the time). If a cert denial is observed, then in the second period only searches up to .6 are admitted. Following a cert grant and affirmance, all searches up to .74 are admitted, with compliance in roughly three-quarters of the conflict region.

Finally, for $p_1 = .9$, the moderate type would signal with probability 1, making reversal certain, so that the initial lower court complies and admits the search. The high court affirms, regardless of type. In the second period, there is full compliance: all searches in the conflict region are admitted (if the initial search had been excluded, then the high court would have reversed leading to the same result).[50]

The expected compliance in the second period depends on the initial belief that the cert pivot is moderate. For $p_1 = .5$, the expected compliance is all cases up to .63 (.62 given the moderate type). For $p_1 = .75$, the expected

50. For a value of p_1 this high, affirmance is not really necessary to sustain future compliance; an equilibrium could be sustained in which compliance leads to cert denial and affirmance is seen as only an error.

compliance increases to.73 (.71 given the moderate type). For $p_1 = .9$, full compliance is expected (regardless of type).

Extending the Game

Extending the number of cases in the second period makes signaling more attractive. Because of this, the high court's signals are less convincing, reducing the extent of future compliance. Even so, this leads to greater pre-emptive compliance in the first period given the higher chance of strategic reversal. In fact, compliance in period 1 can be sustained under a higher probability that the cert pivot is moderate than that which would sustain compliance in period 2. In the previous example, to sustain a case at .65 in the second period, the belief that the cert pivot is moderate must be at most 76 percent. For an identical case in the first period, the threshold is only 58 percent. This is significant, as p_1 can be seen as the posterior belief of a prior period 0 with prior belief p_0. To induce compliance in period 1, p_0 need only be reduced to $p_1 = 58$ percent.

Extending the number of periods (even with a single case per period) increases the pressure for strategic reversal, as well as the extent of pre-emptive compliance.[51] As in the well-known Chain-Store Game (see Fudenberg and Tirole, 1993), even a small chance of the extreme type can sustain compliance in longer games.[52] The size of the necessary prior chance of the extreme type (p_0) shrinks geometrically as the number of rounds increases. For any initial belief p_0, there is a number of rounds $t(p_0)$ in which the lower courts pre-emptively comply with certainty, after which the lower court risks non-compliance, which can then lead to actual signaling reversals (and not merely threats thereof). For a series of cases fixed at position x_1, for a number of rounds t (sufficiently high), the chance of signaling (reversing) is 1, and so the lower court complies so long as $p_0 \geq \bar{p}^t$ (which goes to 0 as t goes to infinity).[53]

Thus, even the smallest chance that the cert pivot is extreme can sustain full compliance in the long run, given R4. This again makes R4 preferable to R5 (given that a single cert pivot cannot rein in both sides simultaneously).

51. Affirmance would not be supportable as an action played each and every time the lower court complied (it requires a longer/weightier future than does reversal) but as a message sent at the point in the game when non-compliance would be otherwise imminent. Strategic affirmance, of course, does not serve to induce pre-emptive compliance, so the argument of this section is unaffected by affirmance strategies.

52. The extended game can be seen as a version of the Chain-Store Game with the entrant always weak ($q^0 = 0$) and with some uncertainty as to the payoffs (a and b) for fighting and accommodating (given that the positions of future cases are uncertain).

53. As per Fudenberg and Tirole (1993), this is unique when the discount factor is one and can be sustained under an infinite horizon for a discount factor close to one.

It also means that there is no need to resort to R3 (or fewer) for full compliance even if the cert pivots are too close to the median.

Conclusion

This article makes three contributions to the existing literature. The basic model, following in the path of CSS, highlights the tension between certiorari and compliance – this tension is shown to be a fundamental feature of the politics of the judicial hierarchy.

By treating certiorari and compliance as endogenous, and by adopting a more sophisticated conception of judicial preferences, the model yields new insights as to the roles that rules and information play. I offer a formal solution to the puzzle of the Rule of Four, thus connecting the Court's principal–agent problem to the larger theoretical problem of endogenous rules. The Rule of Four, despite its countermajoritarian facade, actually serves to increase majoritarian dominance, making it consistent with the Majoritarian Postulate. It is pareto superior to a Rule of Five and is sufficient (as compared to smaller cert rules) to induce complete compliance, given either moderate ideological disparity between justices or minimal uncertainty combined with a sufficient time horizon.

Finally, this analysis reveals heretofore unnoticed incentives for strategic reputation building by the justices, in both this model and the CSS model. Lower court beliefs are made endogenous, showing that both reversals and affirmances can be used to manipulate these beliefs so as to engender future compliance.

The model has a number of empirical implications:

- We should observe the uncertworthy region. In the search-and-seizure context, the most intrusive search admitted by liberal lower courts should be less intrusive than the least intrusive search excluded by conservative lower courts – a result compatible with those of CSS.
- Cases that make it onto the Court's docket should relate to the positions of the median and the cert pivots. When the cert pivotal justices are farther away from the median, we should see greater compliance in the lower courts. When the importance of an issue is relatively low or the decision costs are high, the uncertworthy region should be larger – which, however, also means increased incentives for reputation building.
- We should observe reversal to be more likely than affirmance (both because of error correction and the signaling strategies). Affirmances might be used strategically in new issue areas, wherein many similar cases are expected.

- There should be reactions in the lower courts when a new justice joins the Court. The entry of a new justice, particularly in a pivotal position, will increase uncertainty and signaling incentives. This may explain the well-noted 'freshman effect', in which the early voting of a justice differs from later behavior, as well as other behavioral changes over time.[54] We might also observe a 'senior effect' – justices near the end of their tenure face less of an incentive for strategic behavior aimed at future cases.[55]

As a final note, although this article focuses on the politics within the judicial hierarchy, much of its logic should extend to conflicts with other branches and the politics of other hierarchies.

APPENDIX

Proof of Proposition 1

$u_H(g|c) = x_H - x - k$ which is less than $u_H(\bar{g}|c) = x_H - x$ for $k > 0$. $u_H(g|\bar{c}) = x_H - x - k$ which is greater than $u_H(\bar{g}|\bar{c}) = 0$ if and only if $x_H - k < x < x_H$. $u_L(\bar{c}) = |x - x_L|$ which is greater than $u_L(c) = 0$ if $x_H - k < x < x_H$ by backward induction. Otherwise, $u_L(c) = |x - x_L|$ which is greater than $u_L(\bar{c}) = -\varepsilon$.

Proof of Proposition 2

Consider the right half of $\overline{UR}(\nu)$ (the argument for the other half is symmetric), with $x \geq x_{H_5}$. For a Rule of ν, note that $u_{H_\nu}(g|\bar{c}) \leq u_{H_i}(g|\bar{c})$ for $i < \nu$. If justice H_ν would grant cert given non-compliance, so will $(\nu - 1)$ other justices, making H_ν pivotal. Note that $u_{H_\nu}(g|\bar{c}) = x - x_{H_\nu} - k$, so H_ν denies cert (given noncompliance) if and only if $x < x_{H_\nu} + k$.

Proof of Corollary 2.1

The upper bound of $\overline{UR}^C(\nu)$ if $x_{H_\nu} + k$ which is weakly less than the upper bound of $\overline{UR}^C(\mu)$ which is $x_{H_\mu} + k$. The argument is symmetric for the other side of the uncert-worthy region.

Proof of Proposition 3

If x_2 is outside of the conflict region, then the proof is as in Proposition 1. Otherwise, working backwards, the cert pivot plays as in Proposition 1 in period 2. Given this,

54. Justice Black, for example, started his tenure as a liberal but became more conservative later on. There should be a better explanation of this than that he had had a stroke (Woodward and Armstrong, 1979). Justice Blackmun, meanwhile, moved in the opposite direction. For both of these justices, the lower courts had shifted drastically over their tenures.

55. Consider, for example, Justice Blackmun's 11th-hour switch on the death penalty or Justice Powell's similar about faces, post-retirement (Jeffries, 2001).

L_2 will comply if and only if $p_2 \geq (x_2 - x_L)/(x_2 - x_L + \varepsilon)$, or equivalently, $x_2 \leq x_L + p_2\varepsilon/(1 - p_2)$. Broken down by histories, and given the cert pivot's first-period strategy, $p_2|(\bar{c}, \bar{g}) = 0$ (the extreme type always grants). Next, $p_2|(\bar{c}, g) = p_1/(p_1 + (1 - p_1)\lambda_r)$ so that $p_2|(\bar{c}, g) = 1$ if $x_1 > \bar{x}$ (only the extreme type grants). If $x_1 \leq \bar{x}$ and $p_1 > \bar{p}_r$, then $p_2|(\bar{c}, g) = p_1$, so $p_2 \geq (x_2 - x_L)/(x_2 - x_L + \varepsilon)$ if and only if $x_2 \leq \bar{\bar{x}}$. If $x_1 \leq \bar{x}$ and $p_1 \leq \bar{p}$, then $p_2|(\bar{c}, g) = (\bar{\bar{x}}_r - x_L/\bar{\bar{x}}_r - x_L + \varepsilon)$ so $p_2 \geq (x_2 - x_L)/(x_2 - x_L + \varepsilon)$ if and only if $x_2 \geq \bar{\bar{x}}_r$. Next, $p_2|(c, g) = p_1/(p_1 + (1 - p_1)\lambda_a)$ so that $p_2|(\bar{c}, g) = 1$ if $n < 2/k$ (only the extreme type ever grants). If $n \geq 2/k$ and $p_1 > \bar{p}_a$, then $p_2|(\bar{c}, g) = p_1$, so $p_2 \geq (x_2 - x_L)/(x_2 - x_L + \varepsilon)$ if and only if $x_2 \leq \bar{\bar{x}}$. If $n \geq 2/k$ and $p_1 \leq \bar{p}_a$, then $p_2|(\bar{c}, g) = (\bar{\bar{x}}_a - x_L)/(\bar{\bar{x}}_a - x_L + \varepsilon)$, so $p_2 \geq (x_2 - x_L)/(x_2 - x_L + \varepsilon)$ if and only if $x_2 \geq \bar{\bar{x}}_a$. Finally, if $n < 1/k$, neither grants, so $p_2|(c, \bar{g}) = p_1$, so $p_2 \geq (x_2 - x_L)/(x_2 - x_L + \varepsilon)$ if and only if $x_2 \leq \bar{\bar{x}}$. If $n \geq 1/k$, the extreme type always grants, so $p_2|(c, \bar{g}) = 0$. For the extreme type in period 1, $u_e(g|\bar{c}) > u_e(\bar{g}|\bar{c})$, regardless of period 2. Let

$$D_e = u_e(g|c) - u_e(\bar{g}|c) = \left[x_{H_5} - x_1 + n\int_{(x_{H_5}-k)}^{\hat{x}} (x_{H_5} + k - x_2)\,dx_2\right] - \left[x_{H_5} + k - x_1 + n\int_{(x_{H_5}-k)}^{\hat{x}} (x_{H_5} - x_2)\,dx_2\right]$$

where $\hat{x}$ depends on n and p_1. If $n < 1/k$, then $D_e < 0$ regardless of $\hat{x}$. If $n \geq 1/k$, $\hat{x} = x_{H_5}$ or $\bar{\bar{x}}$ or $\bar{\bar{x}}_a$ depending on p_1 and n. For any of these, $D_e \geq 0$. For the moderate type in period one, let $\lambda_r|\bar{c}$ be the probability of reversing, so that

$$u_m(\lambda_r|\bar{c}) = \lambda_r\left(x_{H_5} - x_1 - k + n\int_{(x_{H_5}-k)}^{\hat{x}} (x_{H_5} - x_2)\,dx_2\right) + (1 - \lambda_r)(0)$$

with $\hat{x}$ the limit of compliance within the conflict region in period 2. If $x_1 > \bar{x}$, then $\hat{x} = x_{H_5}$ and $\partial u_m/\partial\lambda_r < 0$ (so always deny). If $x_1 \leq \bar{x}$ and $p_1 > \bar{p}_r$, then $\hat{x} = \bar{\bar{x}}$ and $\partial u_m/\partial\lambda_r > 0$ (so always grant). If $x_1 \leq \bar{x}$ and $p_1 \leq \bar{p}_r$, then $\hat{x} = \bar{\bar{x}}_r$ and $\partial u_m/\partial\lambda_r = 0$ (indifference, thus allowing mixing). Similarly, let $\lambda_a|c$ be the probability of affirming, so that

$$u_m(\lambda_a|c) = \lambda_a\left(x_{H_5} - x_1 - k + n\int_{(x_{H_5}-k)}^{\hat{x}} (x_{H_5} - x_2)\,dx_2\right) + (1 - \lambda_r)(x_{H_5} - x_1).$$

If $n < 2/k$, then $\hat{x} = x_{H_5}$ and $\partial u_m/\partial\lambda_a < 0$ (so always deny). If $n \geq 2/k$ and $p_1 > \bar{p}_a$, then $\hat{x} = \bar{\bar{x}}$ and $\partial u_m/\partial\lambda_a > 0$ (so always grant). If $n \geq 2/k$ and $p_1 \leq \bar{p}_a$, then $\hat{x} = \bar{\bar{x}}_a$ and $\partial u_m/\partial\lambda_a = 0$ (indifference, thus allowing mixing). Finally, for $L_1, u_{L_1}(c) = 0$ and $u_{L_1}(\bar{c}) = (1 - p_1)(-\varepsilon) + p_1(\lambda_r(-\varepsilon) + (1 - \lambda_r)(x_1 - x_L))$. If $x_1 > \bar{x}$, then $\lambda_r = 0$, and so $u_{L_1}(\bar{c}) > 0$ if and only if $p_1 > \bar{p}$. If $x_1 \leq \bar{x}$ and $p_1 > \bar{p}_r$, then $\lambda_r = 1$, and so $u_{L_1}(\bar{c}) < 0$. If $x_1 \leq \bar{x}$ and $p_1 \leq \bar{p}_r$, $\lambda_r = \varepsilon p_1/(1 - p_1)(\bar{\bar{x}} - x_L)$ and $u_{L_1}(\bar{c}) < 0$ if and only if $p_1 > \bar{p}_r\bar{p}$. So, if $x_1 \leq \bar{x}$, $u_{L_1}(c) \geq u_{L_1}(\bar{c})$ if $p_1 \geq \bar{p}_r\bar{p}$.

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Printing Errors and Corrections

1. Page 65, Figure 1, it should be +/- k, not +/- $\frac{k}{2}$

2. Page 66, the last row of the utility function for H should read:

$$0 \text{ if } \begin{cases} x \le x_H, l = \bar{c}, h = \bar{g} \\ x > x_H, l = \bar{c}, h = \bar{g} \end{cases}$$

3. Page 67, in the first full paragraph, it should read "all searches with $x \le (x_H - k)$"

4. Page 69, Proposition 2 should read

For $1 \le \nu \le 5$, $\overline{UR}(\nu) = \{x \mid x_{H_{10-\nu}} - k < x \le x_{H_5}\} \cup \{x \mid x_{H_5} \le x < x_{H_\nu} + k\}$

Or, equivalently,

For $1 \le \nu \le 5$, $\overline{UR}(\nu) = \big((\min(x_{H_5}, x_{H_{10-\nu}} - k), \max(x_{H_5}, x_{H_\nu} + k)\big)$

5. Page 71, in the first full paragraph, it should read "For any positive value of $k<.5$," or the word "strictly" should be dropped.