
Strategic Anticipation of En Banc Review in the U.S. Courts of Appeals

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The quest for empirical evidence of strategic judicial behavior has produced mixed results. This study finds such evidence in the decisions made while crafting an opinion. Central to any opinion is which precedents are cited and whether their scope is limited (negative treatment) or expanded (positive treatment). I look for evidence of strategic anticipation of en banc review in these decisions using an original dataset of published search and seizure cases from the U.S. Courts of Appeals from 1953 to 2010. A panel is less likely to negatively treat a precedent with which the full circuit is more closely aligned. Circuit preferences also have an effect on citation itself, but only when the panel is at least moderately aligned with a precedent. Moreover, the panel's own ideology is only a significant predictor of citation when the full circuit is favorably disposed toward a particular precedent.

Research has documented evidence of judges pursuing a variety of goals, most notably shaping legal policy to conform to their own ideological preferences. A broad swath of studies examine whether judges pursue their goals strategically by taking the anticipated actions of other relevant actors into account. One particular type of strategic behavior is when lower courts take steps to avoid reversal on appeal. The quest for empirical evidence of this type of strategic judicial behavior has produced mixed results (Bowie and Songer 2009; Hettinger, Lindquist, and Martinek 2004; Van Winkle 1997). I build on this line of work by examining how federal circuit judges use precedent in their opinions, specifically evaluating whether these micro-level decisions reveal indications that such judges strategically balance acting ideologically with avoiding reversal by the full circuit sitting en banc.

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Three-judge panels in the U.S. Courts of Appeals resolve the vast majority of circuit cases. These panels face potential oversight from two sources, the U.S. Supreme Court and their own circuit rehearing a case in an en banc proceeding (Boyd and Spriggs 2009; Kim 2006). This article focuses on the often-overlooked relationship between panels and their circuit. Strategic action is particularly feasible when an actor faces potential review by well-known colleagues (Bowie and Songer 2009; Giles et al. 2007). This detailed knowledge of potential reviewers may facilitate strategic behavior that is more subtle than filing a dissenting opinion. Therefore, I look to opinion content for manifestations of strategy by exploring whether panels' decisions about how to use precedent are influenced by the ideological composition of the full circuit. A strategic panel may strive to craft an opinion the full circuit would be less likely to reverse by taking the circuit median's ideology into account when discussing existing caselaw.

This article empirically tests for evidence of strategic anticipation of en banc review using an original dataset containing 13,334 search and seizure opinions published¹ by federal circuit courts from 1953 to 2010. Using this list of possible cases a judge might cite (precedents), I analyze how panels cite and treat binding circuit precedents in the opinions from 1990 to 2010. The choice set for possible citation is constructed using precedents from within the same circuit as the opinion, as those are legally binding under the doctrine of *stare decisis* (Barnett 2002). Starting with this extensive list of possible cases a judge might cite, I import a well-established measure of document similarity from the field of machine learning to construct a narrower choice set of cases a panel might more realistically consider. This cutting-edge technique of using an automated computational summary of the similarity between an opinion and a precedent also provides the substantial advantage of being able to control for opinion-precedent similarity in the empirical analysis.

The outcome of a case determines who wins, but the significance for future legal policy usually lies in the opinion rather than the judgment. Central to any opinion is which precedents are cited and whether their scope is limited (negative treatment) or expanded (positive treatment). If panel judges select and use precedent strategically with respect to the possibility of en banc review, these decisions should reflect the extent to which the full

¹ Federal circuit courts often dispose of routine cases by means of decisions that are not intended for publication. Such "unpublished" opinions do not carry the same precedential weight as opinions the judges have specifically earmarked for publication (Merritt 1990).

circuit is aligned with a particular precedent. The results provide evidence that the ideological preferences of the entire circuit do influence citation and treatment decisions. Panels are less likely to negatively treat precedents with which the circuit is more closely aligned. Circuit preferences also have an effect on citation itself, but only when the panel is at least moderately aligned with a precedent. Moreover, the panel's own ideology is only a significant predictor of citation when the full circuit is favorably disposed toward a particular precedent. All of these effect sizes are quite small, which is not surprising considering the rarity of en banc review and the fact that a single opinion contains a large number of micro-decisions about whether and how to treat individual precedents. Although each decision is small in scope, the way these individual threads are woven together creates the very fabric of the law. Shedding light on how these threads are chosen and used helps contribute to our understanding of how strategy plays a role in the evolution of legal policy.

Strategic Pursuit of Goals in the U.S. Courts of Appeals

Like judges more generally, federal circuit judges pursue a variety of goals. These goals can include making policy in accordance with their ideological preferences, preserving or enhancing professional reputation, and efficiently disposing of cases (Baum 2009; Epstein, Landes, and Posner 2013; Klein 2002). In addition to pursuing such goals directly, without reference to other actors, judges may act strategically to maximize such goals in light of the anticipated behavior of other relevant actors in the judicial hierarchy. For example, circuit judges may strategically seek all three goals listed above by pursuing a fourth goal of avoiding reversal on appeal (Cross 2005; Klein and Hume 2003; Smith 2006). Avoiding reversal may or may not have independent significance to a judge, but it does serve to maximize the other three goals. Being overturned on appeal negates policy influence, potentially damages reputation, and creates additional work. While it may be possible for a judge to maximize all goals simultaneously, most of the time a judge must strike a balance amongst multiple goals. Exploring when and why circuit judges balance the anticipated actions of others against their own goals is important to understanding judicial decisionmaking in the federal circuits. This study focuses on examining how circuit judges balance the twin goals of following their own ideological preferences and avoiding reversal by the full circuit.

Although the federal circuit courts are subordinate to only one court, circuit judges face potential reversal from two sources. The vast majority of appeals filed in the federal circuit courts are

resolved by randomly assigned panels of three judges (Collins and Martinek 2011; Kim 2009). Such panel decisions may be reviewed either by the U.S. Supreme Court or by the full circuit in an en banc proceeding. The empirical evidence of circuit judges acting strategically with respect both sources of potential reversal is mixed (Atkins 1972; Blackstone and Collins 2014; Bowie and Songer 2009; Hettinger, Lindquist, and Martinek 2004). Following the example of existing work, I focus on only one of the two potential sources of review. Specifically, this article examines panel behavior in light of the possibility en banc review. Van Winkle (1997) finds that judges who are in the ideological minority in a circuit are less likely to vote according to their ideology when they have fewer allies in their circuit. In a similar vein, scholars have found that panel minority judges who are empowered through an ideological alliance with the majority of their circuit are more likely to dissent (Blackstone and Collins 2014; Cross and Tiller 1998; Kim 2009). However, Hettinger, Lindquist, and Martinek (2004) fail to find such evidence of strategic dissent.

Changing one's vote is a high-cost compromise that might rarely (if ever) be justified in light of the low probability of en banc review (Bowie and Songer 2009). Crafting an opinion offers innumerable opportunities for making much smaller concessions that may, nevertheless, help obviate review. The few studies that look beyond votes provide some evidence that lower court judges craft the text of their opinions to reduce the likelihood of reversal. There is evidence from administrative law cases that circuit judges strategically select legal grounds that are more difficult to overturn on appeal when facing potential review from an ideological opponent (Smith and Tiller 2002). Another study demonstrates that federal district judges utilize more hedging language, which makes conclusions more difficult to falsify, when they are more ideologically distant from the reviewing circuit (Hinkle et al. 2012). Federal circuit judges use Supreme Court precedent with an eye to how closely the current Supreme Court is aligned with a particular precedent (Westerland et al. 2010). However, Spriggs and Boyd (2009) fail to find a connection between the ideology of the reviewing circuit and how federal district judges use U.S. Supreme Court precedents. Like these studies, I tap into the rich informational content available in the text of judicial opinions. Specifically, I look for strategic balancing of panel ideology and reversal avoidance in the way precedents are used in panel opinions.

Strategic use of Precedent

Judicial decisionmaking encompasses much more than deciding who wins and loses. Each outcome must be justified by a

written opinion that itself constitutes a bundle of microlevel decisions. Central among these are which precedents to cite and how they should be discussed. When a panel faces the task of crafting an opinion, a panoply of authorities are typically relevant to the argument(s) the panel wishes to make.² Decisions about whether to cite or ignore a precedent and whether to expand or contract the scope of a cited precedent can be used to accomplish one or more judicial goals (Hansford and Spriggs 2006; Niblett 2010; Spriggs and Hansford 2002). Much like one person's vote in an election, each of these decisions, individually, has little impact on the overall development of policy. Nevertheless, uncovering patterns in these decisions can shed light on the important larger picture of how circuit judges pursue and balance different goals in opinion writing. Furthermore, the very small cost incurred by compromising on the use of one particular precedent may itself be a reason to expect this type of strategic behavior.

A variety of factors influence how judges use precedent, and multiple actors are in a position to influence those decisions as well. I focus primarily on two factors, panel ideology and circuit ideology. Exploring how panel judges balance the goals of policy influence and avoiding reversal en banc sheds light on the extent to which the possibility of en banc review, a rare procedure, plays a role in the form and content of the thousands of panel opinions circuit courts publish every year. This approach is similar in structure to Hettinger, Lindquist, and Martinek's (2004) examination of whether anticipation of en banc review influences panel judges' decision to dissent. Like them, I develop and test hypotheses about panel behavior if panel judges do or do not take the possibility of en banc review into account. One of the benefits of this approach is that a very low incidence of actual en banc review poses no barrier to empirical testing. If the infrequency of review means panel judges pay no attention to circuit preferences, such a pattern will emerge in the data.

First, I consider the role of panel ideology. Specifically, I explore the impact of how closely aligned a panel is with a particular precedent. The long line of research demonstrating the important role of ideology in judicial decisionmaking includes decisions about the use of precedent (e.g., Choi and Gulati 2008; Hansford and Spriggs 2006). Citation decisions offer the opportunity to influence policy in two different ways. When a panel

² One panel judge is primarily responsible for producing each opinion, but the other two may weigh in on its content. Moreover, the authoring judge's law clerk may produce the initial draft, and judges vary in how much editing they undertake (Landes, Lessig, and Solimine 1998). For simplicity, I focus on the panel as the decision-making unit and leave untangling these complexities to future research.

produces a published opinion it does not just make policy in that case, it also shapes existing law. Citing or positively treating a precedent with which a panel is ideologically aligned strengthens the policy impact of its own opinion by framing it in terms of congruent precedent. Such a use also maintains or expands the policy impact of the precedent it cites. Conversely, a panel can use negative treatment to restrict the future scope of a precedent that is ideologically distant from itself. As a result, a conservative panel seeking to shape legal policy in accordance with its own ideological preferences will be more likely to cite a conservative precedent than a liberal precedent. Reinforcing the continued applicability of a conservative precedent and being able to rely on its conservative arguments provide distinct policy-related benefits not available when citing a liberal precedent.

Ideological Hypothesis: As a panel's ideological alignment with a precedent increases, the panel will be more likely to cite the precedent, more likely to positively treat a cited precedent, and less likely to negatively treat a cited precedent.

Second, I consider the role of the full circuit's ideological alignment with a precedent. A panel may use precedent to further the goal of avoiding en banc reversal. Clark and Carrubba (2012) present a formal model of judicial hierarchy that predicts that concern about potential review can lead a lower court judge to devote extra effort to improving the quality of her opinion. In their framework, opinion quality is a broad term that can include a variety of opinion characteristics that make it more persuasive (Clark and Carrubba 2012). They point out that persuasiveness can be subjective, and other research has indicated that decision makers find information they agree with ideologically to be more convincing (Braman and Nelson 2007; Lupia 2002). Consequently, a panel seeking to avoid reversal en banc may pursue that goal by taking the preferences of the circuit median into account when making decisions about the use of precedent. This could include ignoring or narrowing the scope of precedents the circuit would find particularly undesirable ideologically, or it could include making sure to cite or expand the scope of precedents with which the circuit is closely aligned.

There is evidence that the ideology of panel members and the ideology of the outcome they reach both play a role in granting en banc review (Clark 2009; Giles, Walker, and Zorn 2006). The utility the circuit derives from exercising en banc review is based on the distance between the panel's outcome and the circuit's preferred outcome (discounted by the cost of exercising review). A panel can shield its opinion from en banc review by

moving the case outcome closer to the circuit's preferred outcome, thus decreasing the utility of en banc review (Clark 2009). Similar logic can be applied to decisions about precedent. The circuit has a preference for how each individual precedent should be used. The utility gained from reversing the panel's usage of a precedent depends on how close the panel's usage is to what the circuit prefers to do (again discounted by the cost of en banc review). For example, if a circuit prefers to positively treat a precedent, it would gain more utility from overturning a panel ruling that negatively treats that precedent than from overturning a panel ruling that simply cites the precedent. Consequently, en banc reversal is more likely if the panel chooses negative treatment. The panel can decrease the utility of reversing a particular use of precedent by moving its own action closer to the action preferred by the full circuit. The overall pattern that will emerge if this is happening is that the circuit's ideological alignment with a precedent will influence the panel's use of precedent.

Direct Strategic Hypothesis: As the full circuit's ideological alignment with a precedent increases, a panel will be more likely to cite the precedent, more likely to positively treat a cited precedent, and less likely to negatively treat a cited precedent.

Neither panel ideology nor circuit ideology will necessarily dominate decisions regarding the use of precedent. The goal of avoiding reversal is intrinsic to preserving the panel's influence over legal policy, and these two objectives must be balanced in order for them to be jointly maximized. A policy-oriented panel that disregards the full circuit may find its influence in a case supplanted by en banc review, while a panel that is solely guided by the circuit's preferences has no independent influence on legal policy either. When the panel and full circuit share either a common affinity or antipathy toward a precedent, both goals can be maximized with the same behavior. When the panel and circuit hold different views of a precedent, the panel must strike a balance.

Up to this point, existing theory regarding strategic behavior applies to the use of precedent in a fairly straightforward manner. However, decisions regarding precedent have distinct features that make it possible to develop novel theoretical expectations regarding strategic behavior. Balancing reversal avoidance with policy influence is necessary in two broad types of situations, those in which the panel is closely aligned with the precedent (but the circuit median is not) and those in which the panel is ideologically distant from the precedent (but the circuit median is close to the precedent). Because of variation in the visibility of different decisions, a panel's optimal strategic balance of

policy and reversal avoidance goals is not necessarily symmetrical under these two situations.

For a panel, citing a precedent and ignoring a precedent have an asymmetric impact on the overall utility of en banc reversal. The benefit to the circuit of changing a citation to a noncitation and vice versa is comparable, but the cost of such review is not. This is because citing a precedent is a more visible decision. Judges on the full circuit become aware of the panel's decision to cite after investing only the effort necessary to read the opinion. Conversely, if a panel ignores a precedent, that decision is more difficult for the full circuit to evaluate. Just looking at the opinion is necessary (to verify a precedent was not cited), but not sufficient. Some additional effort must be invested whether it is 10 minutes to look up a familiar precedent or hours of research to investigate a complicated topic. Essentially, if the full circuit wants to exercise en banc review over a panel's decision to ignore a precedent, it must pay an additional buy-in cost to learn which precedents were ignored. This additional cost decreases the overall utility to the circuit of exercising review over a decision to not cite a precedent compared with the utility of exercising review over a decision to cite.

The asymmetric visibility of deciding whether to cite or ignore a precedent suggests that a panel has more flexibility to follow its own preferences when the circuit is more closely aligned with a precedent. Consider a simplified example of a liberal panel in a conservative circuit considering a conservative precedent. The circuit is aligned with the precedent, but the panel is not. If the panel follows its own preferences (rather than the circuit's) it will tend to not cite the precedent. Such a decision is low visibility. The circuit must seek information outside the opinion itself to become aware of the decision. This additional effort increases the cost of review. However, if the precedent is liberal the panel would prefer to cite the decision. This would be easily visible to the conservative circuit. The lower cost incurred to learn about the decision means that the utility of reviewing this decision is higher. All else being equal, reviewing a decision to cite provides greater utility and is, therefore, more likely than reviewing a decision not to cite. A strategic panel should be less deferential to the full circuit when en banc review is less likely. Consequently, such a panel would be more likely to rely on its own ideological preferences regarding citation when the circuit is closely aligned with a precedent than when the circuit is ideological distant from a precedent.

Conditional Strategic H1: As the full circuit's alignment with a precedent increases, the panel's alignment with the precedent will have a larger effect on citation.

Unlike citation and noncitation, treatments share a similar level of visibility. Whether a panel opinion positively or negatively

treats a precedent or merely cites it, the nature of that treatment can be learned by simply reading the opinion. No additional buy-in cost is incurred to learn of one of the treatment types. Therefore, there is no reason to expect panels to balance competing goals differently in terms of which treatment to give a cited case. However, there is asymmetry between citation and treatment. On the one hand, reviewing any treatment (positive, neutral, or negative) is possible without the additional buy-in cost imposed by outside research. On the other hand, as discussed above, one of the available citation decisions does impose an additional buy-in cost, lowering the utility of review. Consequently, en banc review of panel decisions about citation provides a lower level of utility on average than reviewing treatment decisions. As the universal visibility of treatment decisions poses a greater risk of review, a strategic panel should give more weight to the circuit's preferences in treatment decisions than in citation decisions.

Conditional Strategic H2: The effect of the full circuit's alignment with a precedent on treatment decisions will be larger than its effect on the citation decision.

Other Factors that Influence the use of Precedent

Properly analyzing the relative effects of policy and avoiding reversal requires also controlling for other factors that influence citation and treatment and may be correlated with either the panel or circuit's ideology. Seeking to maximize efficiency and pursuing reputational benefits are both goals likely to have an impact on how panel opinions are crafted. The burden of efficiently selecting and discussing precedents is primarily borne by the judge authoring the opinion. One way for the author to maximize efficiency is to rely on precedents with which they are already familiar from previous work. A judge will be quite familiar with those precedents he wrote. In a wider variety of cases an authoring judge will have knowledge of a precedent due to citing it in a previous case. Therefore, an opinion should be more likely to cite a precedent written by the same author or a precedent previously cited by the author. Another way efficiency may influence citation patterns on average is that busier judges in circuits with higher caseloads might cite fewer cases overall due to the increased time pressures they face. Finally, judges who have been on the bench longer might have developed familiarity with more precedents over time and, therefore, be able to cite more cases with greater efficiency. Accounting for such patterns is important because the need for efficiency is one source of path dependency

in citation patterns. Citing a case once makes it easier and faster for the same judge to cite that precedent in future cases.

A number of features of a precedent reflect its strength in terms of legal doctrine. A panel may seek to employ stronger legal precedents to pursue a variety of goals; building professional reputation, increasing persuasiveness, or fulfilling its perception of the appropriate judicial role. While I do not disentangle these goals, I do control for a variety of features of a precedent that legal doctrine and culture suggest are applicable. Central to the process of analogical reasoning is the proposition that judges should apply relevant precedents (Aldisert 1989; Schauer 1987). Precedents that are more similar to the panel opinion should be more legally relevant. Consequently, they should be more likely to be cited. Moreover, because the role of analogical reasoning is the very foundation of a common law legal system, the similarity of a precedent should emerge as a particularly important predictor of citation.

In addition to relevance, several other characteristics of a precedent indicate its doctrinal strength. Precedents accompanied by a dissenting opinion provide a less firm foundation as an alternate legal viewpoint is explicitly recorded (Johnson 1979; Posner 2008). Precedents resolved *per curiam* provide less solid backup because such opinions typically reflect the authoring court's judgment that the case is not important (Hinkle 2015; Hume 2009). Conversely, *en banc* precedents are particularly strong as circuits only review the most important cases *en banc* and such rulings benefit from the combined wisdom of a larger number of judges (Hume 2009). A precedent might also provide more convincing arguments when it was penned by a particularly well-respected jurist (Klein 2002). Another indicator of a high quality precedent is extensive in-depth discussion of various legal precedents as evidenced by a substantial use of direct quotations (Hume 2009). Subsequent judges may be more likely to rely on and expand the scope of a ruling that is well-researched and provides an thorough discussion of existing case law. A longer precedent may also indicate more thorough and detailed legal analysis, or it may simply cover a wider array of legal topics. Whether precedent length reflects quality or complexity (and, therefore, applicability to a wider range of subsequent cases) it should be correlated with a higher probability of citation (Black and Spriggs 2008).

In addition to these static features of a precedent, over time the strength of each precedent changes as well (Black and Spriggs 2013; Gerhardt 2008). This is due to the simple passage of time as well as the impact of subsequent cases that cite or treat a precedent. As a result, it is important to consider the legal strength of a precedent at the time it is considered for inclusion in an opinion. Such dynamic variables reflecting when and how a precedent has been used help account for a second source of

path dependency. Cases that are cited more frequently tend to pick up momentum in terms of future cites not only because of efficiency concerns, but also because each repeated use of a precedent contributes to its strength.

Other features of the context within which panel judges make citation decisions may also be relevant. For example, responding to the arguments posed in a separate opinion may require the majority opinion to cite or treat a greater number of precedents. Moreover, although research suggests the presence of dissenting opinions is not necessarily correlated with the anticipation of en banc review (Hettinger, Lindquist, and Martinek 2004), caution still militates in favor of accounting for such a possibility. Consequently, I control for whether the panel opinion was accompanied by a dissenting opinion and whether it was accompanied by a concurring opinion. Circuit characteristics may also influence citation practices. Larger circuits may develop a norm of citing and treating more precedents in each opinion simply because they are accustomed to having a larger body of circuit law to consult. Finally, both the length of the opinion itself and the actual number of precedents available to choose from are important. A longer opinion can contain more citations than a shorter opinion, and a larger choice set makes it less likely that any given precedent will be cited.

Data and Research Design

Studying judges' decisions regarding which precedents to cite requires identification of not only a set of opinions to study, but also a relevant choice set of potentially applicable precedents (Niblett 2010). I focus on a subset of cases in one particular issue area: Fourth Amendment search and seizure law. This topic is well-suited for this study because it incorporates a discrete set of legal issues that are routinely raised in litigation, and relevant cases can be identified by the simple expedient of finding cases that cite the Fourth Amendment of the United States Constitution.³ Using Lexis, I collected every such published circuit case from 1953 to 2010. After excluding all opinions that do not address the merits and all opinions that do not contain the word "search" or "seizure" (or derivations thereof) at least once, the resulting dataset contains 13,334 cases. I analyze citation patterns in the panel opinions from 1990 to 2010 ($n = 7,299$).⁴ The cases

³ The legal publication, *Shepard's Citations*, provides this list.

⁴ Studying the use of precedent in published opinions ensures that en banc review, while not very likely, is at least plausible.

in the dataset from 1953 to 1989 and all en banc cases are used only as precedents that may be cited.

There are many types of legal authority a judge may cite including case law from a variety of sources. The legal doctrine of *stare decisis* assigns different levels of significance to different types of authority. To hold the effect of legal doctrine as constant as possible, I focus on the use of one particular type of binding precedent, published opinions from within the same circuit. For each opinion, this choice set potentially includes every precedent in the dataset from its own circuit from 1953 up to the day before the opinion was issued.⁵ However, even within one issue area many precedents will remain uncited simply because they raise different legal questions. To solve the fundamental problem of identifying those precedents (among thousands of cases) that are so dissimilar that citation is exceedingly unlikely, I turn to the field of machine learning.

When you type a query into Google, the results are produced based on an algorithm used to automatically rank how similar the text of a query is to each website. Using a basic version of such technology, I calculate how similar each opinion is to every binding precedent preceding it in the dataset.⁶ These similarity scores for each opinion are then sorted to create a ranking of all possible precedents from least similar to most similar. For the sake of computational efficiency, the scoring does not take the order of words into account. Similarity is assessed based on the number and importance of words that occur in both opinions. Words that appear in fewer cases within the entire dataset are given a higher weight as they carry more information. For example, the appearance of the word “curtilage” in two cases would increase the similarity score more than the appearance of the word “defendant” in both. Two search and seizure cases that discuss curtilage are more likely to be similar cases than two search and seizure cases that mention a defendant.

This method provides a feasible way to objectively assess a large body of caselaw involving millions of pairwise combinations and narrow down the choice set for each opinion in a principled way. Moreover, the process is analogous to the actual procedure judges and their clerks use to conduct legal research. The human task of legal research usually begins with typing relevant terms into Westlaw or Lexis and searching for precedents. Such a

⁵ When the Fifth Circuit was split in 1981, the judges agreed that all existing precedents from the old Fifth Circuit would be binding in the newly-created Eleventh Circuit as well (Barrow and Walker 1988: 245). Consequently, I include all precedents from the old Fifth Circuit in the choice set of all later cases from both the Fifth and Eleventh Circuits.

⁶ Technical details regarding these calculations are provided in Appendix A.

search will produce a list of cases sorted by anticipated relevance, possibly restricted by time or court, that the researcher will review to form her own conclusions about relevance. The sophisticated algorithms powering Westlaw and Lexis searches (together with the researcher's skill in constructing useful query terms) largely perform the initial task of filtering out precedents that are utterly irrelevant. The primary difference for my purposes is that rather than constructing a query, the text of the opinion is used to evaluate the relative relevance of existing precedents. One limitation of this approach is that there may be some endogeneity in this measure. While it would be preferable to use text generated prior to the citation/treatment decision (such as the district court ruling being appealed or legal briefs submitted by the parties) this type of information is not readily available for most cases in the dataset. However, I am able to avoid the most obvious cause of endogeneity by excluding all quoted text from each opinion before calculating similarity scores. When an opinion quotes text from a precedent, the same words in both documents will increase the similarity score. Excluding quoted text eliminates this potential source of endogeneity.⁷

Although choosing a cutoff point is necessarily somewhat arbitrary, the potential precedents ranked in the bottom half in terms of similarity to an opinion are not viable candidates for citation. Therefore, I utilize only the precedents in the top fifty percent of the similarity ranking as the choice set for the first stage analysis of which cases judges choose to cite (and which they ignore). This leaves a fairly large choice set in play, which will still include many cases that are not very similar to the opinion. However, an examination of the relative similarity between opinion-precedent pairs for precedents that are actually cited confirms that this cutoff point does include most cited precedents in the choice set. Figure 1 illustrates that the vast majority of cited precedents (94.2 percent) are in the top half of an opinion's similarity scores. Raising the cutoff point to examine only the top 20 percent most similar precedents would exclude nearly one-fourth of cited precedents. Dropping the cutoff point to look at the top 80 percent most similar precedents would increase the size of the choice set well beyond what a judge could realistically be expected to consult. Moreover, Table 4 in Appendix B demonstrates that these alternative thresholds lead to similar empirical results.

⁷ For any given opinion-precedent pair, only a small portion of the quoted text (if any) is likely to be from that particular precedent. However, text is such a rich source of data that dropping all quoted text does not impair the quality or utility of similarity scores.

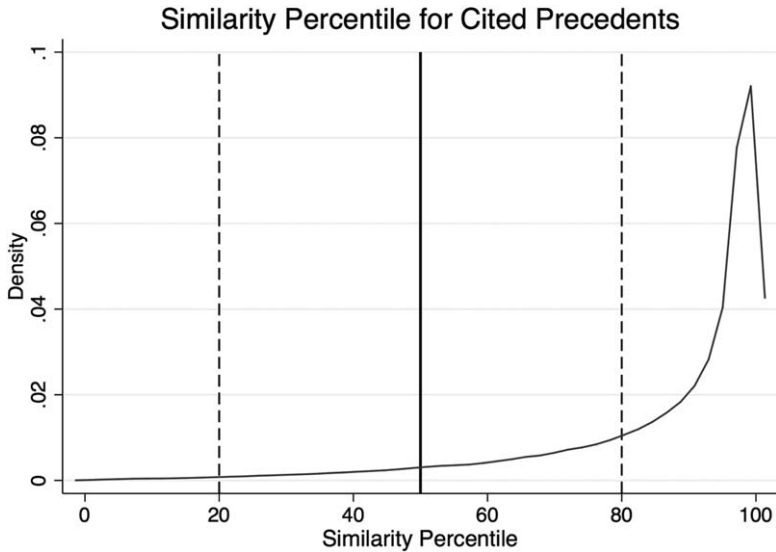


Figure 1. Distribution of Similarity Percentile for Opinion-Cited Precedent Pairs: The Solid Vertical Line Represents the Threshold for Establishing the Choice Set for Each Opinion. The Dotted Lines Show Alternative Thresholds for Which the Relevant Empirical Analyses are Provided in Appendix B. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

The unit of analysis is an opinion-precedent pair. There is an observation for each pair between an opinion and every precedent in its choice set. The first stage decision of whether to cite a precedent in the choice set is modeled using a probit model. For the opinion-precedent pairs where the precedent was cited, I use a multinomial probit model to examine whether the precedent was treated negatively, neutrally, or positively. A two-stage decision-making process such as this sometimes raises the problem of correlated residuals between the two stages biasing the estimates at the second stage (Heckman 1979). However, two separate Heckman models examining negative and positive treatment as separate binary outcomes fail to reveal any statistically significant correlation in the residuals.

Although the treatment categories are ordinal, some explanatory variables may make both positive and negative treatment more likely than neutral treatment. For example, more similar precedents may be expected to receive more in-depth treatment overall, both positively and negatively, than less similar precedents. As a consequence, an ordered probit (or logit) is not appropriate in this context because the parallel slope assumption is likely violated (Borooah 2002). For both the citation and treatment models each opinion appears in the dataset every time it is

paired with a precedent. Therefore, I estimate robust standard errors clustered on the opinion in both models.

Shepard's Citations provides data on both the citation and treatment of precedents. As some treatment categories in *Shepard's* can be both ambiguous and heterogeneous, I follow the advice of Spriggs and Hansford (2000) and only utilize treatment categories that clearly indicate either positive or negative treatment. I employ their classification of which treatments are positive and negative. "Followed" is the only *Shepard's* treatment classified as positive while negative treatments are the following: 'Distinguished', 'Criticized', 'Limited', 'Questioned', 'Overruled', and 'Disapproved'. The (rare) *Shepard's* treatment, 'Superseded', while negative in character, actually signals a precedent has been rendered irrelevant due to a subsequent statute. Consequently, I exclude such superseded precedents from the choice set of all subsequent opinions."⁸

The key explanatory variables of *Panel Alignment* and *Circuit Alignment* are constructed using Judicial Common Space ("JCS") scores. JCS scores are based on the ideology of the political elites who appointed a judge and are located on a scale from -1 (liberal) to 1 (conservative) (Epstein et al. 2007; Giles, Hettinger, and Peppers 2001; Poole 1998). First, the outcome of each precedent is coded as conservative or liberal.⁹ As JCS scores denote the level of conservativeness, when a precedent is conservative *Panel Alignment* is simply the JCS score of the panel median. When a precedent is liberal *Panel Alignment* is the panel median JCS score multiplied by -1. The variable *Circuit Alignment* is constructed the same way using the circuit median JCS score instead of the panel's. For example, if the circuit median has a fairly conservative JCS score of 0.35, when a precedent is conservative *Circuit Alignment* will equal 0.35 but when a precedent is liberal *Circuit Alignment* will equal -0.35. Increasingly conservative circuits will be both more aligned with conservative precedents and less aligned with liberal precedents than a more moderately conservative circuit. The interaction between *Panel Alignment* and *Circuit Alignment* rounds out the key explanatory variables.

Control variables for both the citation and treatment models include a number of characteristics of the opinion, the precedent, and their relationship to each other. *Similarity Percentile* is the

⁸ A panel opinion also ceases to be legally relevant on the rare occasion the circuit decides to rehear the case en banc. This occurs for only 0.51 percent of panel opinions in the dataset. Each is excluded from the pool of available precedents when it is replaced by the en banc opinion.

⁹ As these are all search and seizure cases, rulings in favor of the defendant in a criminal case or the plaintiff in a civil rights case are coded as liberal. Conversely, rulings in favor of the government in a criminal case or the defendant in a civil rights case are coded as conservative. Precedents with split outcomes are excluded from analysis.

percentile of a precedent's similarity to the opinion compared with all other possible binding precedents in the choice set. *Same Author* equals one when the same judge wrote both the opinion and the precedent and zero otherwise. When the dataset contains a previous case in which the opinion author cited the precedent, *Previous Cite by Author* equals one, and it equals zero otherwise. *Author Tenure* is the number of years the author of the opinion has served on the circuit court. I also control for precedents with a dissenting opinion, precedents decided per curiam, those decided en banc, and those written by a particularly prominent jurist. Most of these factors are straightforward to code with the exception of the prominence of the author. I rely on the prestige scores calculated by Klein and Morrisroe (1999). Unfortunately, these useful scores are not available for all circuit judges (let alone available for all 20 years). However, their list of the top-25 circuit judges calculated based on data from 1989-1991 does constitute a list of elite circuit court jurists who enjoyed such an established reputation throughout the 20 years studied here. Therefore, *Elite Author* equals one if a precedent is penned by a judge with a top-25 prestige score and zero otherwise.

Dynamic controls include the number of times a precedent has been both cited and treated (either positively or negatively) by a case from the same circuit as well as its vitality. *Vitality* is the number of positive treatments minus the number of negative treatments (Hansford and Spriggs 2006). For each opinion-precedent pair these measures only include use of the precedent that occurred prior to the opinion. Both very new and very old cases are less likely to be cited (Black and Spriggs 2008), so I control for both the age of a precedent and age squared. Measures of the logged word counts of both the opinion and precedent are included. The final feature of a precedent is the proportion of the text that is quoted.¹⁰ Binary variables indicate whether the opinion was accompanied by a dissent or concurrence. *Circuit Size* indicates the number of active judges on the circuit in the relevant year. The opinion year is included to control for time. In addition, in the citation model (but not the treatment model) I control for the logged number of available precedents in the choice set and the citing circuit's caseload.¹¹ A summary of the dataset is provided in Appendix B.

¹⁰ Using a series of regular expressions written in Python, I identify all quoted text in each opinion and generate a measure of the proportion of words in the opinion that are quoted.

¹¹ *Caseload* is the average number of cases terminated per active judge in the circuit and year of the opinion. The Federal Court Management Statistics are available online at http://www.uscourts.gov/Statistics/FederalCourtManagementStatistics/FederalCourtManagementStatistics_archive.aspx.

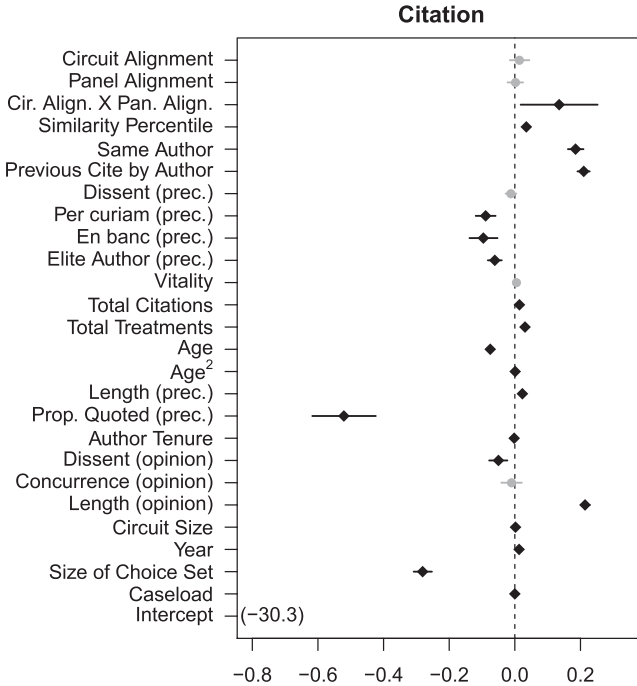


Figure 2. Citation Model: Probit Regression Estimates of the Effect of *Circuit Alignment*, *Panel Alignment*, Their Interaction, and a Range of Control Variables on the Decision of Whether to Cite a Precedent. Dots and Diamonds Indicate Point Estimates. Bars Indicate 95 percent Confidence Intervals. Diamonds (Instead of Dots) and Bars in Black (Instead of Gray) Denote that a Coefficient has a p Value Less Than 0.05. The Full Regression Table is Presented in Table 2 in Appendix B.

Results

The first place I look for evidence of strategic anticipation of en banc review is the decision regarding which precedents to cite and which to ignore. Figure 2 presents the results of the citation model.¹² The coefficients for *Circuit Alignment*, *Panel Alignment*, and their interaction are all in the expected positive direction, but neither constituent variable is statistically significant independent of the other.¹³ Whether the panel's ideology has a significant effect depends on the full circuit's ideology (and vice versa). Marginal effects are presented in Figure 3 along with their 95

¹² As this dataset is so large, it is worth noting that a large N does not change the probability of Type I error, but it does facilitate uncovering very small effects.

¹³ All discussion of statistical significance is at the 0.05 level.

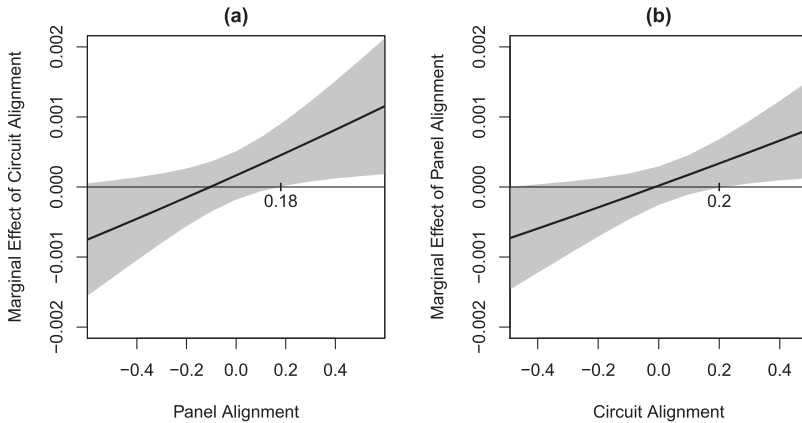


Figure 3. Marginal Effects of *Circuit Alignment* and *Panel Alignment* on Citation: Panel (a) Shows the Marginal Effect of *Circuit Alignment* Over the Range of *Panel Alignment* While Holding all Other Variables at Their Median. Panel (b) Shows the Marginal Effect of *Panel Alignment* Over the Range of *Circuit Alignment* While Holding all Other Variables at Their Median. The Shaded Regions Around Each Line Delineate the 95 percent Confidence Intervals.

percent confidence intervals to illustrate the results. Figure 3 shows the marginal effect of each variable over the range of the other (with all other variables set at their median). Panel (a) demonstrates that the marginal effect of *Circuit Alignment* is positive and statistically significant when the panel is at least somewhat aligned with the precedent (*Panel Alignment* > 0.18). Panel (b) shows that the marginal effect of *Panel Alignment* is positive and statistically significant when the circuit median is at least moderately aligned with the precedent (*Circuit Alignment* > 0.2).

These results provide varying levels of support for the hypotheses. First, there is some evidence in support of the *Ideological Hypothesis*. The panel's own ideology does influence the citation decision for a substantial portion of the dataset. While *Panel Alignment* is only significant when *Circuit Alignment* is greater than 0.2, this includes 54 percent of the observations in this dataset. To the extent that the *Ideological Hypothesis* is not supported over the entire range of *Circuit Alignment*, this presents evidence in support of *Conditional Strategic Hypothesis 1*, which anticipates panels having greater flexibility to follow their own ideology when a circuit is more strongly aligned with a precedent. When the circuit is not aligned with a precedent, the effect of the panel's ideology is not statistically significant. *Circuit Alignment* only has a statistically significant positive marginal effect when *Panel Alignment* is greater than 0.18. This provides support for the *Direct Strategic Hypothesis* for the 46 percent of observations that meet this criteria.

The microlevel of analysis makes evaluating the substantive impact of statistically significant effects a difficult task. A judicial opinion is made up of many decisions about individual precedents. Also, the choice set contains hundreds of possibilities so the probability of citing each case is quite small. The marginal effects in Figure 3 appear to be minute because the baseline probability of citing a precedent when all variables are set at their median is only 0.0012.¹⁴ As so many cases are not cited,¹⁵ it is more relevant to assess the impact of variables of interest while holding the other explanatory variables at their median value among the cited precedents. The baseline probability of citing such a precedent is 0.056. When both *Circuit Alignment* and *Panel Alignment* are at their maximum, the predicted probability of citation increases to 0.061. Figure 3 show that both *Circuit Alignment* and *Panel Alignment* have the greatest impact when the other is at its maximum value. Keeping *Panel Alignment* at its highest value in the data and moving *Circuit Alignment* to its minimum value reduces the predicted probability of citation to 0.049, a roughly 20 percent reduction. Changing *Panel Alignment* to its minimum while holding *Circuit Alignment* at its maximum produces a similar result with a predicted probability of 0.051.

One way to evaluate the substantive meaning of the strategic and ideological effect sizes is to compare them to the effect of the variable expected to have the largest impact, *Similarity Percentile*. As I anticipate, given the importance of legal doctrine, the similarity of two cases plays a statistically and substantively significant role in the citation decision. The median cited precedent has a *Similarity Percentile* of 95, and the predicted probability of citation is 0.056. A similar precedent that is in the 85th percentile in terms of similarity to the opinion has a predicted probability of only 0.026. This 10-point reduction in *Similarity Percentile* more than halves the likelihood of citation. In short, strategy (i.e., circuit preferences) can move the predicted probability a maximum of 0.01, while moving the legal doctrine variable by less than one standard deviation changes the predicted probability by 0.03.

The next model explores the decision regarding whether to treat a cited precedent negatively, neutrally, or positively. These results are presented in Figure 4 with neutral treatment as the baseline category. There is no evidence that either the panel's ideology or strategic anticipation of en banc review significantly impacts the decision to positively treat a cited precedent.

¹⁴ Predicted probabilities are generated using stochastic simulations (Brambor, Clark, and Golder 2006; King, Tomz, and Wittenberg 2000).

¹⁵ The results produced by a rare effects logit model lead to the same substantive conclusions as the probit model results presented here.

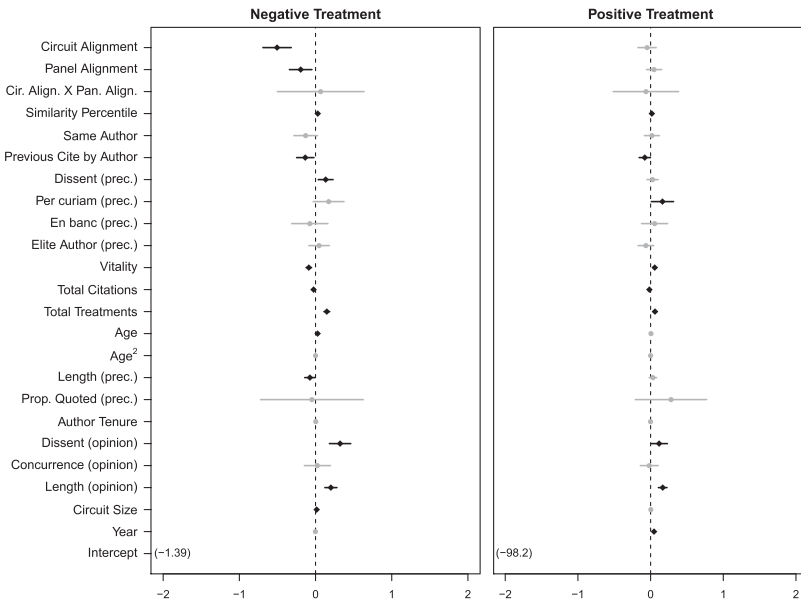


Figure 4. Treatment Model: Multinomial Probit Regression Estimates of the Effect of *Circuit Alignment*, *Panel Alignment*, Their Interaction, and a Range of Control Variables on the Decision to Treat a Cited Precedent Negatively, Neutrally, or Positively. Neutral Treatment is the Baseline Category. Dots and Diamonds Indicate Point Estimates. Bars Indicate 95 percent Confidence Intervals. Diamonds (instead of dots) and Bars in Black (Instead of Gray) Denote That a Coefficient has a *p* Value Less Than 0.05. The Full Regression Table is Presented in Table 3 in Appendix B.

However, the hypotheses regarding treatment are supported with respect to negative treatment. The statistically significant negative impact of *Panel Alignment* supports the *Ideological Hypothesis*. The more closely aligned a panel is with a cited precedent, the less likely it is to treat it negatively. The *Direct Strategic Hypothesis* anticipates the same pattern with respect to *Circuit Alignment*. As expected, *Circuit Alignment* is also a significant negative predictor of negative treatment. There is no evidence of an interactive effect (either in the regression table or on more in-depth examination).

Figure 5 graphs the predicted probability of negative treatment across the range of *Circuit Alignment* and *Panel Alignment* to illustrate the impact of circuit and panel ideology respectively. The predicted probability a panel that is maximally aligned with a precedent negatively treats that precedent is only 0.029, while the minimum level of *Panel Alignment* increases that rate to 0.043. *Circuit Alignment* has an even larger effect. At the maximum value of *Circuit Alignment* the predicted probability is 0.027 and it more

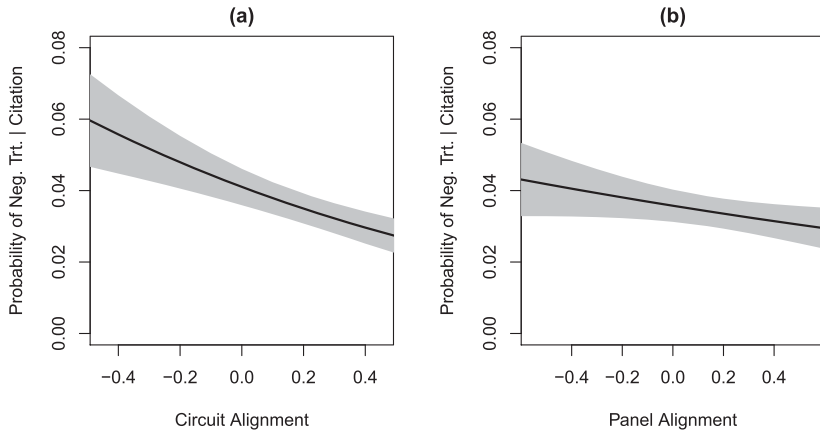


Figure 5. Effect of *Circuit Alignment* and *Panel Alignment* on Negative Treatment: This Graph Provides the Predicted Probability of Negative Treatment (Conditional on Citation) and 95 percent Confidence Intervals Over the Range of *Circuit Alignment*, Panel (a), and *Panel Alignment*, Panel (b). All Other Variables are Held at Their Median.

than doubles to 0.060 at the minimum value of *Circuit Alignment*. Once again, I compare this to the impact of *Similarity Percentile*. More similar precedents are significantly more likely to be both negatively and positively treated. It makes sense that less similar precedents are more likely to simply be cited rather than discussed at length. For purposes of comparison, I focus on the impact *Similarity Percentile* has on the predicted probability of negative treatment. The median case has a *Similarity Percentile* of 95 and a 0.034 predicted probability of negative treatment. When similarity is in the 85th percentile this drops to 0.023.

The final hypothesis left to be evaluated is *Conditional Strategic Hypothesis 2*, which posits that the circuit's ideology will have a larger direct impact on treatment than citation decisions. The predicted probability of citation changes from 0.053 to 0.057 over the range of *Circuit Alignment*. The predicted probability of negative treatment changes from 0.060 to 0.027 over the same range. These predicted probabilities hold all other variables at the median for cited precedents. Even though the baseline probability of negatively treating a cited precedent is lower overall than the corresponding probability of citing the same type of precedent, the absolute effect of moving *Circuit Alignment* from its minimum to maximum value is considerably larger for negative treatment (0.033) than for citation (0.004). The fact that *Circuit Alignment* has a statistically significant impact on negative treatment regardless of the panel's ideology further supports the conclusion that *Conditional Strategic Hypothesis 2* is supported, at least

with respect to negative treatment. Together, these results indicate that panels give more weight to circuit ideology in the more visible decision about negative treatment than in the less visible decision of whether to cite a precedent.

Across the models the control variables tend to perform as expected. As discussed, when the precedent is very similar to the opinion it is more likely to be cited, positively treated, and negatively treated. Authors are more likely to cite both precedents they wrote and those they have cited previously. Previous citation makes both negative and positive treatment significantly less likely. Per curiam cases are less likely to be cited, but curiously more likely to be treated positively. Precedents with a dissenting opinion are more likely to generate negative treatment. Somewhat strangely, en banc precedents and those written by circuit judges with an elite reputation are less likely to be cited. Various aspects of how a precedent has been dealt with by previous cases within the same circuit also influence citation and treatment. Precedents with greater vitality are more likely to be positively treated and less likely to be negatively treated. A greater number of total cites to a precedent increases the probability of citation, but decreases both types of treatment while an increase in the total number of previous treatments increases the probability of citation and both kinds of treatments. An opinion that is accompanied by a dissent is less likely to cite any given case, but conditional on citation both negative and positive treatment are more likely than in opinions unaccompanied by a dissent. Panels in larger circuits tend to be more likely to both cite a precedent and to negatively treat cited precedents. Other factors such as the age, length, and composition of the respective opinions involved also play a role in these decisions. Finally, when a judge has a greater number of circuit precedents from which to choose, the probability of any given case being cited decreases.

Discussion

In light of the mixed results the literature contains regarding strategic voting by panel judges, the findings, here, illustrate the utility of delving into the content of judicial opinions. Focusing on the use of precedent reveals patterns of strategic choices consistent with what some scholars have found in voting behavior (Blackstone and Collins 2014; Cross and Tiller 1998; Kim 2009; Van Winkle 1997). The evidence of strategic behavior presented, here, is quite broad. There is some support for each of the strategic hypotheses. First, the *Direct Strategic Hypothesis* is supported by the findings that the ideological preferences of the entire circuit

directly influence both citation (when *Panel Alignment* >0.18) and negative treatment. Second, *Conditional Strategic Hypothesis 1* is supported by the finding that a panel is less likely to rely on its own ideology when the full circuit is more ideologically divergent from the precedent. In fact, *Panel Alignment* only significantly predicts citation when the circuit is at least moderately aligned with a precedent (*Circuit Alignment* >0.2). Finally, *Conditional Strategic Hypothesis 2* is supported by the finding that *Circuit Alignment* has a larger (and more consistent) impact on negative treatment than on citation. These patterns are consistent with the intuition that panels give greater weight to circuit preferences when making decisions that are easier for the circuit to review.

For the most part, the preferences of the full circuit fail to have a statistically significant impact in precisely the circumstances predicted by strategic anticipation of en banc review. However, the one major exception is the positive treatment model. There is no evidence that the circuit's ideology plays a role, either direct or indirect, in the panel's decision about expanding the scope of a precedent. These results are consistent with the research that has failed to find any evidence of strategic behavior (Hettinger, Lindquist, and Martinek 2004). However, there is also no evidence that the panel's own ideology influences positive treatment. Most likely this lack of explanatory power is due to similarity between a simple citation (i.e., neutral treatment) and a positive treatment. A neutral treatment can be viewed as a soft positive treatment, different in degree rather than type. A mere citation to a precedent tacitly indicates acknowledgment and applicability. The time pressures under which panel opinions are drafted may lead to judges putting less effort into the relatively fine distinction between mere citation and positive treatment. The fact that many of the control variables also fail to reach statistical significance for positive treatment further supports this conclusion.

The institutional structure that makes review from the full circuit possible is the most plausible explanation for the patterns that emerge in this study. The effect of legal doctrine is largely controlled for by looking at the use of only one type of precedent, so cases have the same general status under *stare decisis*. To the extent that more relevant cases carry greater weight according to legal doctrine, controlling for the similarity between an opinion and precedent accounts for this variation as well. In fact, the statistical and substantive significance of *Similarity Percentile* in both the citation and treatment decisions reinforces the importance of legal considerations. The model accounts for the impact a panel's own ideology has on the selection and use of precedent as well. Even after controlling for law and ideology

(and several control variables), the composition of the full circuit emerges as a factor in how opinions are drafted at the panel level. Moreover, circuit impact is conditional in precisely the manner theorized based on the asymmetric visibility of noncitation. These patterns provide evidence that under some circumstances panels seek to avoid en banc review entirely or avoid reversal en banc by tailoring their opinions to be persuasive to the full circuit.

Bowie and Songer (2009) argue that rational judges should not be expected to anticipate review because of the rarity of that procedure and uncertainty over when review will be exercised. Yet, there is evidence presented here that panels strategically use precedent. Two features of these findings do reflect the underlying reality that en banc review is quite rare. The first is the microlevel decision of the use of a particular precedent. Compromising on this level imposes only a small cost. Crafting an opinion while taking the circuit's preferences into account may be viewed by panels as a cheap way to protect against even the unlikely possibility of en banc review. Second, in the circumstances where circuit preferences have a statistically significant impact, the size of that impact is, understandably, quite small. While strategy evidently plays some role in how panels use precedent, the small baseline probability of en banc review makes it implausible that strategic anticipation of such review would consistently outweigh other considerations.

An important caveat to the conclusions drawn here is that they are based exclusively on one legal issue area. Search and seizure law is an important topic with broad implications across society. Nevertheless, the question remains whether the results are generalizable to other issue areas. The data do incorporate both civil and criminal cases, so there is little reason to expect that the findings are exclusive to one domain or the other. However, one way search and seizure law is distinct from at least some other legal topics is the sheer bulk of precedents available. Panel-circuit dynamics involving the use of precedent may vary when the universe of potential precedents is smaller. For example, panels may have less discretion when the applicable choice set is smaller and easier for the full circuit to monitor. Under such circumstances the buy-in cost to exercise review over noncitation decisions would be smaller. This suggests that looking for patterns of strategic behavior in an issue area like search and seizure with a vast array of precedents is a fairly difficult case. As circuit preferences exert an effect even under these difficult circumstances, there is reason to believe such patterns exist in other issue areas as well. Ultimately, though, this is an empirical question that can be explored in future research.

In addition to future work expanding this line of inquiry to apply across multiple topics, the results suggest that a number of other related lines of inquiry would prove interesting as well. Perhaps the most obvious move forward is to apply the theoretical expectations about strategic anticipation of en banc review to look for evidence of strategic anticipation of Supreme Court review. Due to the overlap in full circuit and Supreme Court preferences, disentangling these two types of strategy will require extensive additional data collection targeted at circuits that diverge from the Supreme Court ideologically. This study also reinforces the utility of looking for evidence of other types of strategic behavior manifesting in the use of precedent. For example, future work can examine whether an author's use of precedent strategically anticipates the preferences of their panel colleagues. If evidence can be found that circuit preferences impact these microlevel decisions, it suggests that other key actors might influence them as well. Exploring questions like these provides opportunities to supplement our knowledge of how judges vote with knowledge of how they craft legal opinions.

The evidence of strategic citation behavior presented here has important implications for how we understand legal development. Each opinion dynamically shapes the contours of the law. If circuit panels seek to use precedent in a manner that does not stray too far from the preferences of the full circuit, this will result in the law of the circuit gradually moving toward the circuit median. This pattern may already be evident in the data used for this study. Table 1 in Appendix B shows the summary statistics. Overall, the median value of *Circuit Alignment* is 0.23 while the median value of *Panel Alignment* is 0.14. This pattern is consistent with the logical implications strategic citation has for long-term legal development. Of course, these conclusions should not be overstated. The evidence provided here is derived from opinions dealing with a single legal issue. Nevertheless, there is reason to believe that published panel opinions are drafted in the shadow of the full circuit even though the probability of en banc review is ultimately quite low.

Exploring how panels relate to the full circuit is also key to understanding issues such as the interplay between stare decisis and ideological shifts brought about by personnel changes within circuits. When the location of a circuit's median shifts dramatically, the presence (or absence) of strategic use of precedent has implications for how quickly the ideological tenor of circuit law will change. If panels disregard the full circuit's preferences, then all panels still dominated by the old guard will continue to rely on old circuit law that is no longer in line with circuit preferences. This will slow down the overall shift in circuit law. However,

if all panels strategically account for the current circuit median, even the panels farthest from the circuit median will at least partially participate in the (still gradual) process of moving circuit law toward the new circuit median.

Finally, the evidence of strategic action on the part of panels suggests the importance of examining the efficacy of that strategy. Studying the seemingly minuscule effects of microlevel decisions is important because these can aggregate up to help answer questions carrying more obvious substantive significance. For example, does strategic citation usage in panel opinions influence the granting of en banc review or the probability of reversal if such review is granted? The importance of such issues should not be underestimated as the vast majority of federal case law is established by the U.S. Courts of Appeals rather than the U.S. Supreme Court (Cross 2007; Hettinger, Lindquist, and Martinek 2006; Klein 2002). Scholars have increasingly recognized that both law and ideology play important roles in judicial decision-making and the nuances of when, how, why, and under what conditions these factors matter present challenging questions. This study contributes to the work investigating these questions by offering insight into how strategic considerations shaped by institutional structure influence the manner in which the ideology of different actors influences how judges apply existing case law.

Appendix A: Calculating Similarity

The *Similarity Percentile* variable is constructed using cosine similarity scores. This is a standard method from the field of machine learning used to compare the text of two documents (Manning, Raghavan, and Schütze 2008: 111–12). Before calculating the scores, I extracted the text of the majority opinion in each case and removed all quoted text to reduce the endogeneity between the cosine similarity of an opinion-precedent pair and the decision to cite that precedent. Next, I removed all citations, words shorter than three letters, and stopwords. Stopwords are commonly used words such as “a,” “and,” and “the.” These pre-processing steps help reduce the considerable computing power needed to make the necessary calculations.

The equations below provide the mathematical formula used to calculate the cosine similarity score between a treatment case, $d1$, and a precedent, $d2$. N is the number of documents in the corpus. For example, in this study N is 13,334 as that is how many cases are in the full dataset. V is the size of the vocabulary of the corpus; that is, it is the number of words that appear at least once in at least one document in the corpus. Two other

components used in the formula are term frequency and document frequency. Term frequency, $tf_{t,d}$, is the number of times a particular term, t , appears in a particular document, d . Document frequency, df_t , is the number of documents in the corpus which contain a particular term, t , at least once.

$$tfidf_{t,d} = [1 + \log_{10}(tf_{t,d})] \times \log_{10} \left(\frac{N}{df_t} \right)$$

$$\text{CosineSimilarity}(d1,d2) = \frac{\sum_{t=1}^{|V|} (tfidf_{t,d1})(tfidf_{t,d2})}{\sqrt{\sum_{t=1}^{|V|} (tfidf_{t,d1})^2} \sqrt{\sum_{t=1}^{|V|} (tfidf_{t,d2})^2}}$$

Appendix B

Table 1. Summary Statistics: The Length of Both the Precedent and the Opinion are Measured as the Natural Log of the Word Count. The Size of the Choice Set is Also Transformed by Taking the Natural Log of the Raw Count. The Percentages Reported for Positive and Negative Treatment are Conditional on a Precedent Being Cited. All Other Summary Statistics are Calculated Using all 3,031,314 Opinion-Precedent Pairs in the Dataset

Continuous Variables	Mean	Std. Dev	Med.
Circuit Alignment	0.09	0.25	0.23
Panel Alignment	0.06	0.31	0.14
Similarity Percentile	74.99	14.41	75
Vitality	0.12	0.94	0
Total Citations	3.72	4.97	2
Total Treatments	0.59	1.16	0
Age	17.31	11.60	16
Length (prec.)	8.02	0.71	8.03
Proportion Quoted (prec.)	0.10	0.08	0.08
Author Tenure	13.59	8.39	12.67
Length (opinion)	8.14	0.66	8.15
Circuit Size	14.15	5.76	12
Year	2001	6	2003
Size of Choice Set	7.10	0.42	7.17
Caseload	463.97	148.01	440
Dichotomous Variables	1	0	
Citation	0.93%	99.07%	
Positive Treatment	14.64%	85.36%	
Negative Treatment	4.75%	95.25%	
Same Author	2.40%	97.60%	
Previous Cite by Author	6.72%	93.28%	
Dissent (prec.)	15.37%	84.63%	
Per curiam (prec.)	6.99%	93.01%	
En banc (prec.)	2.46%	97.54%	
Elite Author (prec.)	7.64%	92.35%	
Dissent (opinion)	12.03%	87.97%	
Concurrence (opinion)	9.48%	90.52%	

Table 2. Citation Model: Probit Regression Estimates of the Effect of *Circuit Alignment*, *Panel Alignment*, Their Interaction, and a Range of Control Variables on the Decision of Whether to Cite a Precedent. The Reported Standard Errors are Robust Standard Errors That are Clustered on the Opinion and *Denotes a p Value Less Than 0.05

	Coef.	S.E.	p Value
Circuit Alignment	0.014	0.015	0.346
Panel Alignment	0.002	0.012	0.894
Cir. Align. X Pan. Align	0.135*	0.060	0.023
Similarity Percentile	0.035*	0.000	0.000
Same Author	0.185*	0.012	0.000
Previous Cite by Author	0.210*	0.009	0.000
Dissent (prec.)	-0.012	0.008	0.141
Per curiam (prec.)	-0.089*	0.015	0.000
En banc (prec.)	-0.096*	0.022	0.000
Elite Author (prec.)	-0.061*	0.011	0.000
Vitality	0.005	0.003	0.065
Total Citations	0.014*	0.001	0.000
Total Treatments	0.031*	0.003	0.000
Age	-0.075*	0.001	0.000
Age ²	0.001*	0.000	0.000
Length (prec.)	0.023*	0.005	0.000
Prop. Quoted (prec.)	-0.521*	0.049	0.000
Author Tenure	-0.002*	0.001	0.001
Dissent (opinion)	-0.050*	0.014	0.000
Concurrence (opinion)	-0.001	0.016	0.532
Length (opinion)	0.214*	0.007	0.000
Circuit Size	0.002*	0.001	0.045
Year	0.013*	0.001	0.000
Size of Choice Set	-0.281*	0.014	0.000
Caseload	0.000*	0.000	0.000
Intercept	-30.292*	1.767	0.000
N		3,031,314	

Table 3. Treatment Model: Multinomial Probit Regression Estimates of the Effect of *Circuit Alignment*, *Panel Alignment*, Their Interaction, and a Range of Control Variables on the Decision of Whether to Negatively, Neutrally, or Positively Treat a Cited Precedent. Neutral Treatment is the Baseline Category The Reported Standard Errors are Robust Standard Errors That are Clustered on the Opinion and *denotes a p Value less Than 0.05

	Negative Treatment			Positive Treatment		
	Coef.	S.E.	p Value	Coef.	S.E.	p Value
Circuit Alignment	-0.505*	0.094	0.000	-0.048	0.064	0.447
Panel Alignment	-0.195*	0.075	0.009	0.047	0.052	0.364
Cir. Align. X Pan. Align	0.067	0.290	0.818	-0.064	0.229	0.779
Similarity Percentile	0.029*	0.002	0.000	0.017*	0.001	0.000
Same Author	-0.130	0.079	0.099	0.018	0.052	0.733
Previous Cite by Author	-0.135*	0.058	0.020	-0.080*	0.039	0.042
Dissent (prec.)	0.133*	0.049	0.007	0.027	0.038	0.481
Per curiam (prec.)	0.172	0.103	0.093	0.163*	0.078	0.036
En banc (prec.)	-0.075	0.121	0.533	0.055	0.091	0.546
Elite Author (prec.)	0.046	0.068	0.499	-0.065	0.054	0.234
Vitality	-0.088*	0.018	0.000	0.057*	0.013	0.000
Total Citations	-0.026*	0.007	0.000	-0.017*	0.003	0.000
Total Treatments	0.148*	0.019	0.000	0.060*	0.014	0.000

Table 3. *Continued*

	<i>Negative Treatment</i>			<i>Positive Treatment</i>		
	Coef.	S.E.	<i>p</i> Value	Coef.	S.E.	<i>p</i> Value
Age	0.027*	0.009	0.002	0.005	0.006	0.447
Age ²	0.000	0.000	0.113	0.000	0.000	0.415
Length (prec.)	-0.074*	0.034	0.028	0.032	0.025	0.214
Prop. Quoted (prec.)	-0.048	0.343	0.888	0.281	0.250	0.261
Author Tenure	0.003	0.003	0.205	-0.001	0.002	0.755
Dissent (opinion)	0.322*	0.071	0.000	0.117*	0.057	0.040
Concurrence (opinion)	0.024	0.087	0.782	-0.019	0.062	0.765
Length (opinion)	0.201*	0.040	0.000	0.167*	0.030	0.000
Circuit Size	0.015*	0.004	0.001	0.003	0.003	0.383
Year	-0.002	0.004	0.572	0.047*	0.003	0.000
Intercept	-1.393	8.484	0.870	-98.206*	6.451	0.000
N		28,933			28,933	

Table 4. Citation Model With Alternative Similarity Thresholds: Probit Regression Estimates of the Effect of *Circuit Alignment*, *Panel Alignment*, Their Interaction, and a Range of Control Variables on the Decision of Whether to Cite a Precedent Setting the Threshold for Minimum Similarity at the 20th Percentile and the 80th Percentile. The Reported Standard Errors are Robust Standard Errors That are Clustered on the Opinion and *Denotes a *p* Value Less Than 0.05

	<i>Similarity % > 20</i>			<i>Similarity % > 80</i>		
	Coef.	S.E.	<i>p</i> Value	Coef.	S.E.	<i>p</i> Value
Circuit Alignment	0.018	0.014	0.215	-0.018	0.017	0.302
Panel Alignment	-0.006	0.011	0.616	0.006	0.014	0.685
Cir. Align. X Pan. Align	0.156*	0.058	0.007	0.112	0.064	0.081
Similarity Percentile	0.027*	0.000	0.000	0.072*	0.001	0.000
Same Author	0.178*	0.011	0.000	0.174*	0.014	0.000
Previous Cite by Author	0.202*	0.009	0.000	0.223*	0.011	0.000
Dissent (prec.)	-0.006	0.008	0.437	-0.018	0.009	0.050
Per curiam (prec.)	-0.075*	0.015	0.000	-0.117*	0.018	0.000
En banc (prec.)	-0.098*	0.021	0.000	-0.041	0.024	0.086
Elite Author (prec.)	-0.062*	0.010	0.000	-0.047*	0.012	0.000
Vitality	0.003	0.002	0.297	0.007*	0.003	0.021
Total Citations	0.014*	0.001	0.000	0.012*	0.001	0.000
Total Treatments	0.030*	0.003	0.000	0.039*	0.003	0.000
Age	-0.074*	0.001	0.000	-0.075*	0.001	0.000
Age ²	0.001*	0.000	0.000	0.001*	0.000	0.000
Length (prec.)	0.021*	0.005	0.000	0.015*	0.006	0.009
Prop. Quoted (prec.)	-0.596*	0.047	0.000	-0.417*	0.056	0.000
Author Tenure	-0.002*	0.001	0.003	-0.001*	0.001	0.028
Dissent (opinion)	-0.054*	0.013	0.000	-0.060*	0.015	0.000
Concurrence (opinion)	-0.009	0.015	0.572	-0.002	0.017	0.920
Length (opinion)	0.228*	0.007	0.000	0.190*	0.007	0.000
Circuit Size	0.002	0.001	0.056	0.003*	0.001	0.010
Year	0.012*	0.001	0.000	0.014*	0.001	0.000
Size of Choice Set	-0.276*	0.013	0.000	-0.297*	0.016	0.000
Caseload	0.000*	0.000	0.000	0.000*	0.000	0.000
Intercept	-28.832*	1.708	0.000	-35.279*	1.943	0.000
N		4,871,273			1,200,402	

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