STRATEGY, CERTAINTY, AND THE DECISION TO DISSENT ON THE U.S. COURTS OF APPEALS*

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ABSTRACT

While there has been a substantial amount of research on the strategic behavior of political actors, the literature is rife with conflicting findings. We contribute to this debate by examining whether U.S. court of appeals judges dissent for the purpose of inviting en banc and/or Supreme Court review. We dissect aspects of modeling strategic behavior, particularly relating to problems of multicollinearity. We explore these issues by examining the dissenting behavior of court of appeals judges from 1970-2002. Our findings indicate that court of appeals judges strategically dissent, but this behavior is seldom captured by traditional quantitative approaches to modeling judicial behavior. Though our focus is on court of appeals judges, we are confident our conclusions can inform studies of strategic behavior in a variety of political contexts.

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Dissent plays a key role in American politics. The First Amendment of the U.S. Constitution protects citizens' rights to express unpopular positions – to dissent – by way of the Free Speech Clause. Within the legislative branch, there are several mechanisms that enable members of the Senate to interfere with majority rule making, including the use of the filibuster, the hold, and the blue slip procedure with regard to federal judicial nominations. In the executive arena, the president can formally dissent from congressional law making through the use of the veto (and Congress can, in turn, dissent from the president's veto prerogatives by overriding executive vetoes). And, of course, dissents are a prominent feature of the American legal system. Through dissenting opinions, judges on collegial courts are enabled to express their disagreement with their colleagues in the majority, undermining the strength of majority opinions and inviting further consideration of the case.

We investigate the role of strategy as it relates to the decision to dissent on the U.S. courts of appeals. We argue that a judge will be more likely to dissent when en banc and/or Supreme Court review will promote the judge's policy preferences. While previous research has explored this topic, the extant literature is rife with contradictory findings (e.g., Cross and Tiller 1998; Hettinger, Lindquist, and Martinek 2004, 2006; Kim 2009, 2010; Lindquist and Martinek 2009; Linkous and Tiller 2009; Van Winkle 1999). We argue that this confusion has manifested itself, in part, due to issues involving the way strategic behavior in the courts of appeals is modeled.

In addressing this topic, we make a number of contributions to the literatures on judicial behavior, strategy, and the empirical modeling of the behavior of political actors more generally. First, this research enhances our understanding of the occurrence of dissenting opinions on the courts of appeals. The importance of both these courts and dissensus in these institutions is essential for understanding the development of American law. As the docket of the U.S. Supreme Court has declined in recent decades, the courts of appeals have became the *de facto* courts of last resort in the

federal judiciary, acting as the final adjudicative bodies for the overwhelming majority of cases at the federal level (Hettinger, Lindquist, and Martinek 2006: 13). As such, understanding the behavior of judges serving on these courts is significant in its own right. More than this, comprehending the decision to dissent on these courts is vital because dissenting opinions on the courts of appeals have consequences. Dissent undermines the consistency of federal law (e.g., Hettinger, Lindquist, and Martinek 2006: 2), enhances the belief that judicial decision making is driven by the ideological proclivities of the judges, thereby potentially decreasing confidence in the judiciary (e.g., Hettinger, Lindquist, and Martinek 2006: 19), and contributes to the likelihood of en banc and Supreme Court review (e.g., Caldeira, Wright, and Zorn 1999; Giles, Walker, and Zorn 2006).

Second, while there is substantial evidence that strategy plays a role in the decision to dissent on the U.S. Supreme Court (e.g., Maltzman, Spriggs, and Wahlbeck 2000) and on state courts of last resort (e.g., Brace and Hall 1990), empirical support for strategic models applied to the U.S. courts of appeals is much more mixed. For example, Cross and Tiller (1998), Kim (2009), and Van Winkle (1997) find that strategic concerns motivate the decision to dissent on the courts of appeals, while Hettinger, Lindquist, and Martinek (2004, 2006) conclude that the decision to dissent is attributed mainly to ideological differences between a judge and the majority opinion author. These contradictory findings have motivated some to suggest that, due to their heavy workloads, strategic models of judicial decision making may lack face validity in the context of the courts of appeals (e.g., Collins and Martinek 2011: 184). By investigating issues relating to the empirical implications of theoretical models of strategic behavior on the courts of appeals, we seek to eliminate some of this confusion.

Finally, this research speaks to testing theories of strategic behavior, a topic relevant to the studies of political actors at large. Traditional econometric approaches to modeling strategic behavior suggest that the best tests of strategic hypotheses utilize statistical models that pit sincere

and strategic behavior against one another (e.g., Hettinger, Lindquist, and Martinek 2004, 2006; Van Winkle 1999). Such techniques fall victim to numerous statistical pitfalls (e.g., Achen 2002; Schrodt 2010). Most notably, these approaches are plagued by the introduction of multicollinearity into the statistical models, in addition to the imprecise measurement of the key explanatory variables. As we illustrate below, both of these issues have led scholars to reject strategic hypotheses when strategic behavior may well exist. By deriving alternative tests of the empirical implications of our theoretical model, we demonstrate how scholars may have missed evidence of strategy on the part of court of appeals judges. While our focus here is on dissensus in the courts of appeals, this topic has broad applicability for understanding strategic behavior more generally.

This paper proceeds as follows. In the next section, we discuss both sincere and strategic accounts of dissenting behavior on the courts of appeals. Following this, we provide traditional quantitative tests of tests of our theoretical expectations, highlighting the problems that result from approaching strategy on the courts of appeals through conventional econometric modeling. We then provide a series of alternative tests for detecting strategic behavior on the courts of appeals, providing evidence that court of appeals judges dissent for the purpose of inviting en banc and/or Supreme Court review. We close with a discussion of the implications of this work for the study of strategic decision making relating to the behavior of judges and other political actors.

SINCERE AND STRATEGIC DISSENTS

There are two primary explanations of the decision to dissent in the courts of appeals (e.g., Hettinger, Lindquist, and Martinek 2004; Van Winkle 1999). The presence of dissent may simply signal disagreement among the judges on a panel. A sincere account of the decision to dissent predicts that judges issue dissenting opinions when they disagree with the position adopted by the panel majority. This hypothesis predicts that, as ideological distance between a judge and the majority opinion author increases, the probability of a dissent will also increase. This explanation

assumes sincere behavior by judges. If a judge disagrees with a panel outcome and is willing to incur the costs associated with writing separately, we will observe dissent. Under this hypothesis, judges do not consider the potential influence of dissenting on the probability that another court will review the panel decision.

An alternative account of the decision to dissent posits that court of appeals judges may behave strategically by considering the likely actions of the circuit en banc or the Supreme Court. The probability that a case decided by a three-judge court of appeals panel will be reviewed by the Supreme Court or by the circuit sitting en banc increases when the decision is accompanied by dissent (Caldeira and Wright 1988; Caldeira, Wright and Zorn 1999; George 1999; Giles, Walker and Zorn 2006; Ginsburg and Falk 1991). As such, judges may consider how the circuit as a whole or the Supreme Court would decide the case in question on review and dissent for the purpose of inviting review by the circuit en banc or the Supreme Court (e.g., Cross and Tiller 1998; Hettinger, Lindquist, and Martinek 2004, 2006; Van Winkle 1999). Panel members who disagree with a panel outcome and have preferences that are similar to those of either the Supreme Court or their circuit as a whole may dissent to increase the chances that a case is reviewed by another court. This explanation, like the sincere explanation discussed above, assumes that dissent reflects ideological disagreement with the panel majority. It differs from the sincere account of dissenting by suggesting that, under certain conditions, the anticipated actions of a reviewing court may influence the utility of a dissent to a judge. If a potential dissenter suspects that review by the circuit or the Supreme Court would lead to a more favorable policy than that advanced by the panel majority, he or she may dissent to signal the reviewing body that the case warrants review.

The spatial models presented below illustrate strategic characterizations of dissents on the courts of appeals. The actors are a judge considering whether or not to author a dissenting opinion (J), the panel majority (P), and the median member of a reviewing court (R). (The reviewing court

could be either the Supreme Court or the circuit en banc.) We assume that all actors have single-peaked preferences over policy outcomes in a unidimensional space. The utility to a judge of an outcome can be characterized by the distance between the judge's ideal point and the location of the outcome. The best policy a judge can obtain is a policy located at his or her ideal point. The closer a policy is to the judge's ideal point, the more utility he or she derives from that policy.

In the figure above, the ideal point of the reviewing court is located between the ideal point of the potential dissenter and the location of the panel outcome. Because the reviewing court is located closer to the judge than is the panel outcome, the potential dissenter would be made better off if the reviewing court accepted the case for review and imposed its ideal point than if the panel decision is left undisturbed. Under these conditions, it is strategically advantageous for J to dissent. We can think of the distance between the reviewing court (R) and the panel outcome (P) as the potential policy gain that would accrue to the judge if he or she dissents and policy is moved to the reviewing court's ideal point.

In contrast, consider the configuration of preferences presented above. The panel outcome is located between the potential dissenter's ideal point and the ideal point of the reviewing court. If the judge dissents to signal the reviewing court and the reviewing court hears the case and imposes its ideal point, the judge is worse off than he or she is under the panel outcome. Thus, there are no policy gains from dissenting. Here, the distance between the panel outcome and the reviewing court characterizes the policy loss that the potential dissenter would incur with review.

The figure presented above reveals a situation in which the judge is located between the ideal point of the reviewing court and that of the panel majority. When the potential dissenter's ideal point is located here, the potential gain or loss associated with dissent will depend on whether the judge is closer to the location of the panel outcome or to the median member of the reviewing court. If the potential dissenter is closer to the median of the reviewing court than to the panel outcome, dissent will be advantageous. If the dissenter is closer to the panel outcome than to the reviewing court, dissent will be disadvantageous from a strategic perspective.

For all possible configurations of preferences, the potential policy gain (or loss) associated with dissent can be characterized by the following equation:

$$\text{Policy Gain/Loss} = |J - P| - |J - R|$$

Positive values indicate that a potential dissenter will obtain a better outcome if the reviewing court reconsiders the panel outcome and moves policy to the reviewing court's ideal point. Negative values indicate that a judge would be made worse off by review. These expected policy gains and losses can be used to identify the conditions under which strategic dissents should occur. If the strategic account of dissent is accurate, dissent should be more likely when the potential policy gains of would-be dissenters are greater. If the sincere account of the decision to dissent is dominant, the distance between a judge's ideal point and the panel outcome should be the sole predictor of the presence of dissent and dissent should not be systematically related to the relationship between a judge and the location of reviewing courts.

DATA AND MEASURES

To determine whether court of appeals judges strategically dissent from the majority for the purpose of inviting en banc and/or Supreme Court review, we utilize data on the dissenting

behavior of court of appeals judges from 1970-2002, based on the Songer (2009) and Kuersten and Haire (2009) databases. These datasets include a random sample of thirty published cases per circuit for each of the courts of appeals, with the exception of the Federal Circuit. Because we are interested in dissenting behavior on three-judge panels, we exclude en banc panels from the data. As majority opinion authors do not have the option of dissenting, they are excluded. Because we are interested in an individual judge's decision to dissent, we transformed these databases to make the judge-vote the unit of analysis. The dependent variable captures whether or not the judge dissented from the majority and authored a dissenting opinion, coded 1 if the judge authored a dissenting opinion and 0 if the judge did not (Kuersten and Haire 2009; Songer 2009).[1]

Evaluating whether judge's strategically dissent requires measures of the ideologies of the judge, the majority opinion author, the median judge on the circuit, and the median justice on the Supreme Court.[2] Accordingly, we turn to the Judicial Common Space scores (Epstein et al. 2007), which provide estimates for each of these actor's ideological preferences on a common scale. The

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[1] Silent dissents, those instances in which a judge dissents, but does not write separately, are coded as 0. To account for the sampling composition of the data, we employ the weights reported in Kuersten and Haire (2009) and Songer (2009). To control for the non-independence of observations, in that each case is represented by two observations, we use robust standard errors, clustered on case citation. Note that we obtain substantively identical results clustering on the judge instead of the case citation.

[2] We follow others in assuming that panel outcomes are located at the ideal point of the majority opinion author, that en banc outcomes are located at the ideal point of the median member of the circuit, and that Supreme Court outcomes are located at the ideal point of the median member of the Supreme Court (e.g., Hettinger, Lindquist, and Martinek 2006). The assumption that panel outcomes are located at the majority opinion author's ideal point may add to the bias against the strategic dissent hypotheses if judges who join majority opinions are able to exert influence over opinion content. An alternative would be to operationalize the expected policy gains or losses by assuming panel outcomes reflect the ideal points of members of the majority coalition. That is, we would assume that the policy change that results when a judge does not dissent is the ideal point of the panel median and the policy change that results when a judge dissents is the midpoint between the two judges that comprise the majority. When we operationalize our models in this manner, we obtain substantively similar results.

attitudes of court of appeals judges are based on the Giles, Hettinger, and Peppers (2001) scores, while the preferences of the median justice on the Supreme Court for a given year are based on a transformation of the Martin and Quinn (2002) scores, which place Supreme Court justices on a common ideological space as court of appeals judges. Higher values of these variables indicate more conservative ideologies.

Given our spatial models, our tests require variables capturing: 1) the ideological distance between the judge (J) and the panel majority (P) (the predictor of sincere dissent); 2) the policy gain or loss accompanied by dissenting for the purpose of inviting en banc review (EB) (a predictor of strategic dissent); and 3) the policy gain or loss accompanied by dissenting for the purpose of inviting Supreme Court review (SC) (a predictor of strategic dissent). *Ideological Distance* represents the absolute value of the judge's ideological distance from the majority opinion author ($|J - P|$). *En Banc Policy Change* indicates the absolute value of the judge's ideological distance from the circuit median subtracted from the absolute value of the judge's ideological distance from the majority opinion author ($|J - P| - |J - EB|$). *Supreme Court Policy Change* indicates the absolute value of the judge's ideological distance from the median justice on the Supreme Court subtracted from the absolute value of the judge's ideological distance from the majority opinion author ($|J - P| - |J - SC|$).

TRADITIONAL APPROACHES TO MODELING STRATEGIC DISSENTS

Traditional approaches to econometric modeling (e.g., Achen 2002; Schrodt 2010) suggest that testing the strategic dissent hypotheses is straightforward. One simply needs to regress the aforementioned independent variables on the dependent variable, utilizing a maximum likelihood

model that accounts for the dichotomous nature of the dependent variable. We begin our evaluation of strategic dissents using this approach. Our results appear in Table 1.[3]

***** Table 1 About Here *****

Table 1 presents four logit models of a judge's decision to dissent. Models I through III contain only the *Ideological Distance*, *En Banc Policy Change*, and *Supreme Court Policy Change* variables, respectively, while Model IV contains all of these variables in a single model specification. Model I reveals that a one standard deviation increase in the distance from the judge to the majority opinion author ($|J - P|$) increases the likelihood of a dissent by 0.9%. While this influence might seem relatively small at first glance, it is important to note that dissents are rare on the courts of appeals: the mean of the dependent variable is 4.5%.[4] As such, an increase of almost 1% should be appropriately viewed as a relatively strong predictor of dissenting behavior. Model II reports the influence of the policy gains accompanied by en banc review on dissenting behavior ($|J - P| - |J - EB|$). According to this model, when the judge stands to gain a one standard deviation increase in policy by signaling en banc review, the probability of dissenting increases by 0.6%. Model III indicates the influence of the policy gains accompanied by Supreme Court review on dissenting behavior ($|J - P| - |J - SC|$). This model reveals that a one standard deviation policy gain accompanied by signaling Supreme Court review enhances the chances of dissenting by 0.6%.

Once these variables are pitted against one another in the same model specification, a different picture emerges, as illustrated by Model IV. First, the strategic variables (*En Banc Policy Change* and *Supreme Court Policy Change*) lose their statistical significance and flip signs. Second, the

[3] To maintain the focus of this manuscript, we discuss the results of model specifications that exclude control variables. When we add control variables to the model, our results remain substantively unchanged. The appendix reports the results of our models that include control variables.

[4] Given this, we also ran our models using rare events logit (King and Zeng 2001), the results of which corroborate those reported herein.

parameter estimate for the *Ideological Distance* variable increases in size by about 30%. Thus, if one approached modeling strategic behavior on the courts of appeals from the perspective in Model IV, one would reach the conclusion that there is no statistically significant evidence that judges strategically dissent to signal en banc or Supreme Court review, despite the presence of strong positive relationships between our strategic variables and the dependent variable in the bivariate analyses. Our task is to explore whether or not scholars ought to trust the results of Model IV. We argue that without further corroborative analyses, they should not. While Model IV is theoretically appropriate, characteristics of the data bias the model against the strategic hypotheses.

The cause of the differences in the findings between the models in Table 1 is multicollinearity. *Ideological Distance* is correlated with *En Banc Policy Change* at 0.70 ($p < 0.001$) and *Supreme Court Policy Change* at 0.83 ($p < 0.001$), while *En Banc Policy Change* is correlated with S*upreme Court Policy Change* at 0.77 ($p < 0.001$). The mean variance inflation factor of these variables is 3.29 (mean tolerance = 0.32), which is a cause for concern as it results in inflating the variance of the coefficients by a factor of almost 2 (e.g., Allison 1999: 50). What is more, the model reveals classic symptoms of multicollinearity: flipped signs on the parameter estimates (e.g., Mela and Kopalle 2002).

The immediate source of this multicollinearity is the variable that measures the ideological distance from the potential dissenter to the majority opinion author ($|J - P|$). The variables capturing the policy gains a judge can expect to receive from en banc ($|J - P| - |J - EB|$) or Supreme Court ($|J - P| - |J - SC|$) review are, in part, a function of the judge's ideological distance from the majority opinion author ($|J - P|$). As a consequence, the most direct empirical test of our spatial models introduces significant multicollinearity by trying to simultaneously evaluate our sincere and strategic hypotheses.

The secondary source of multicollinearity involves the high correlations between the *En Banc Policy Change* and *Supreme Court Policy Change* variables. When we run a model including only these independent variables (results not reported), neither strategic variable attains statistical significance. The collinearity between these variables stems from two sources. First, both of these variables depend on a judge's ideological distance from the majority opinion author ($|J - P|$). Second, on average, the ideological preferences of court of appeals judges and Supreme Court justices are quite similar, in part due to the reality that the federal judicial selection process results in judges who reflect the preferences of the nominating president and confirming Senate (e.g., Dahl 1957).[5] Thus, it appears that, from a modeling standpoint, including variables capturing the policy gains or losses from both en banc and Supreme Court review in the same model specification is unwise.

In sum, the modeling approach adopted in Model IV of Table 1 is problematic. It leads to flipped signs of the parameter estimates for the strategic variables and inflated values of the standard errors of the coefficients. These problems will increase the difficulty of rejecting the relevant null hypotheses and increase the probability of a Type II error—failure to reject the null hypothesis even though it is false.

Scholars have used alternative methods to test for the use of strategic dissents. Hettinger, Lindquist, and Martinek (2004) identify three regimes that characterize the incentives of judges to use dissents to signal en banc review. They assume that circuit review will result in a policy located within one standard deviation of the location of the median member of the circuit. This range is characterized as an uncertainty zone because a judge cannot be sure of the exact location of policy that will result from en banc review, but he or she can be fairly certain that it will lie within a reasonable distance of the circuit median's preferences. A judge is said to be in an advantageous

[5] For example, the correlation between the ideological preferences of the median justice on the Supreme Court and the median judge on the circuit is 0.36 ($p < 0.001$).

regime when the most distant boundary of the zone of uncertainty is closer to the judge's preferences than the majority opinion author. Dissent is thus advantageous if the potential dissenter would prefer the policy stemming from en banc review to the policy announced by the majority opinion author. Conversely, a judge is in a disadvantageous regime when the policy emanating from en banc review is further from the judge's ideal point as compared to the policy created by the majority opinion author.

This is a creative way to characterize the strategic context; however, it introduces three issues. First, as with the models in Table 1, the distance between the judge and the majority opinion author is built into the regime measures since they depend in part on the distance between the judge and the majority opinion author. Although this method does not introduce the rampant multicollinearity observed in Model IV, it makes it difficult to parse out strategic versus sincere behavior because the primary variable used to predict sincere behavior is built into the measures included to predict strategic behavior. As a result, we cannot be certain that the failure of the regime variables to attain statistical significance results because judges do not dissent for strategic reasons or because of the structural similarity of the variables included to test for sincere and strategic effects. Second, the choice of one standard deviation to delimit the range of the expected policies announced by the circuit is somewhat arbitrary[6] and is not necessarily intuitive.[7] Third, while theoretically relevant and conceptually clear, the zone of uncertainty is a necessarily imprecise tool for the identification of incentives to dissent. For example, a judge that is one standard deviation

[6] Recognizing this, Hettinger, Lindquist, and Martinek (2004: 131) note that they obtain consistent results employing a zone of uncertainty of ±0.05 standard deviations around the circuit median's ideology.

[7] To illustrate, consider a hypothetical five member circuit with the following ideal points: −1, −1, 0, +1, +1. In this situation there is little doubt as to the location of the median member of the circuit. But, the standard deviation of the mean in this example is +1, indicating a very high degree of statistical uncertainty as to the location of the median judge.

closer to the circuit median than the majority opinion author is situated in a regime alongside of a judge who is three standard deviations closer to the circuit median than the majority opinion author. Clearly, the latter judge has more motivation to strategically dissent to invite en banc review. A research design that treats all judges with a motivation to dissent similarly cannot evaluate the effect of the variation in incentives to dissent that are conditioned on a judge's relative distance from the majority opinion author and the reviewing court.

An alternative approach to modeling the probability of strategic dissents employs interaction terms to account for whether or not dissent is strategically advantageous based on the expected policy gains that would accompany a dissent (Hettinger, Lindquist, and Martinek 2006). To capture policy gains that accompany en banc or Supreme Court review, this work relies on the absolute value of the difference between the majority opinion author and the circuit [Supreme Court] median if the judge is closer to the median member of the circuit [Supreme Court] than to the majority opinion author. To capture policy losses, the absolute value of the difference between the majority opinion author and the circuit [Supreme Court] median is utilized, provided the judge is closer to the majority opinion author than the circuit [Supreme Court] median. These variables are then interacted with the predictor of sincere dissents: the absolute ideological distance between the judge and the majority opinion author. This research design allows one to examine the impact of expected policy gains or losses that are accompanied by further review by the circuit en banc or the Supreme Court on the probability of dissent.

As with the variables we constructed for inclusion in the models in Table 1, however, the ideological distance between the judge and the majority opinion author and that of the judge and the reviewing court are built into these measures. As a consequence, this approach also introduces a great deal of multicollinearity into the model, which may account for the failure to find evidence of strategic dissents. Replicating Hettinger, Lindquist, and Martinek's (2006) approach with our data,

we find correlations in the constituent (non-interactive) terms as high as 0.75 and variance inflation factors over 3.0 (tolerance = 0.32). Once the interaction terms are added to the model, multicollinearity becomes even more problematic, with correlations as high as 0.93 and variance inflation factors as high as 24.3 (tolerance = 0.04).[8] As these examples indicate, scholars have had difficulty identifying a theoretically satisfying way to characterize the incentives of court of appeals judges to dissent that does not suffer from issues of multicollinearity.

The problems we identify are endemic to studies of strategic behavior in the courts of appeals. Strategic theories are, by nature, conditional. The expectation of conditional effects requires that researchers construct independent variables, characterizing the strategic context in which judges act, to isolate the conditions under which dissent is advantageous or disadvantageous. While scholars have proposed a number of creative and theoretically compelling ways to characterize the strategic context in which court of appeals judges might act, the construction of these variables frequently requires that researchers impose arbitrary cutpoints or introduce multicollinearity into the statistical models. Of course, some degree of measurement error and collinearity is expected in any empirical analysis. We do not contend that this problem is unique to studies of strategic dissent. Ours is a narrower point—that the difficulty of rejecting a null hypothesis of no strategic behavior is increased by the presence of measurement error and multicollinearity that inheres in even the best attempts of scholars to characterize the conditions under which dissent is advantageous. These difficulties are further compounded by the challenge of disentangling the effects of the fundamentally interconnected variables used to predict sincere and

[8] In particular, the measure of the ideological distance from the judge to the majority opinion author is correlated with the variable capturing the policy gains from Supreme Court review at 0.75 ($p < 0.001$). In the interactive models, eight variables exhibit collinearity levels higher than 0.7 ($p < 0.001$ for all correlations). Likely recognizing this multicollinearity, Hettinger, Lindquist, and Martinek (2006: 85, 87) report separate model specifications for en banc and Supreme Court policy gains or losses, along with a full model specification.

strategic behavior. We now turn to alternative means to evaluate strategic motivations to dissent on the courts of appeals.

ALTERNATIVE APPROACHES TO MODELING STRATEGIC DISSENTS

As we have demonstrated, it is plausible that large scale tests of the use of strategic dissents are biased against finding evidence of strategic behavior on the part of court of appeals judges. We now turn to a sequence of limited, but more precise tests that are not subject to some of the shortcomings highlighted above. First, we evaluate a series of bivariate relationships to assess their consistency with the strategic account of dissenting behavior. Second, we evaluate the hypothesis of strategic dissent in a most-likely case by focusing on panels with mixed partisan composition. These approaches require that we make some significant trade-offs. In some instances, we sacrifice the large sample and nuanced variables that characterize the strategic context in exchange for the elimination of some bias against finding evidence of strategy on the part of court of appeals judges. Our hope is that these supplementary analyses will either confirm the null results above or provide evidence of limited support that comports with the theory of strategic dissent and makes sense of the mixed findings characteristic of the literature.

First, we consider the bivariate relationships between the presence of dissent and our key independent variables. Our theory suggests that we should observe dissents more frequently when: (1) the distance between the judge and the majority opinion author increases (sincere dissent); (2) the anticipated policy gain that would accompany en banc review increases (strategic dissent); and (3) the anticipated policy gain that would accompany Supreme Court review increases (strategic dissent). Significant differences in the mean values of the policy change variables between judges that authored dissents and judges that did not author dissents should be observed if judges use dissent as a signal to reviewing courts.

***** Table 2 About Here *****

Table 2 reports the results of two-sample difference of means tests for the subgroups. As expected, the means for the dissenting group are statistically significantly higher than the non-dissenting group for all variables. With regard to sincere dissents, the average ideological distance from the judge to the majority opinion author is 0.38 for non-dissenters and 0.44 for dissenters. As it relates to dissenting for the purpose of signaling en banc review, we find that the mean policy change for dissenters is 0.14, compared to 0.09 for non-dissenters. Table 2 also reveals that the average policy change a judge can expect from Supreme Court review is 0.12 for dissenters and only 0.06 for non-dissenters. In other words, judges more frequently dissent when they are ideologically distant from the majority opinion author and when they serve to achieve policy gains from en banc or Supreme Court review. Thus, these simple difference of means tests provide support for both sincere and strategic accounts of dissenting behavior on the courts of appeals.

***** Figure 1 About Here *****

An alternative means to examine the relationship between dissents and the policy gains or losses accompanied by en banc or Supreme Court review is to plot the average proportion of dissents conditional on the expected policy change from further review, which is reported in Figure 1. The top graph represents the mean proportion of dissents (y-axis) conditional on the expected policy change from en banc review (x-axis), while the bottom graph reports this information conditional on the expected policy change from Supreme Court review (x-axis). The solid red lines signify the fitted proportion of dissents, while the solid gray lines indicate 95% confidence intervals. As a means to gauge the distribution of these variables, the dashed vertical red lines report one standard deviation below the mean, the mean, and one standard deviation above the mean, respectively, for the policy change variables. The circles represent the observed mean proportion of dissents across the range of the x-axes.

Figure 1 reveals that, for both of the strategic variables, the observed proportion of dissents increases as the expected policy change from en banc or Supreme Court review increases, again providing evidence for strategic accounts of dissenting behavior on the courts of appeals. With regard to the policy change accompanied by en banc review, this figure reveals that judges dissent in about 3.5% of cases corresponding to a policy loss of approximately −0.5. When there is no policy gain or loss accompanied by en banc review, judges dissent in approximately 4% of cases. When judges stand to achieve a +0.5 gain in policy, we observe dissents in almost 5% of cases. As it relates to Supreme Court review, a similar picture emerges. For a −0.5 loss in policy, dissents are observed in about 3% of cases; when there is no policy gain or loss, dissents appear in slightly less than 5% of cases; when a judge stands to achieve a +0.5 increase in policy, dissents occur in about 7% of cases. While these results do not provide absolutely conclusive evidence for strategic accounts of dissenting behavior on the courts of appeals, they are nonetheless telling and lend further support for strategic characterizations of dissents.

We employ additional bivariate analyses to evaluate other empirical implications of our theoretical model. A unique institutional feature of decision making in three-judge panels in the courts of appeals is that decisions are reviewable by two supervising courts: the circuit en banc and the Supreme Court. We now consider the impact of these dual influences. Above, we have demonstrated that judges appear to respond to the potential for both the circuit and the Supreme Court to revise and reverse panel decisions. This suggests that the anticipation of review by the circuit and the Supreme Court may have interactive effects (e.g., Cross and Tiller 1998; Hettinger, Lindquist, and Martinek 2006). When a judge is confident that review by both supervising courts would be advantageous, we should observe dissent more frequently. Conversely, when review by both the Supreme Court and the circuit en banc would result in a policy loss, the occurrence of dissents should be less common. Finally, when review by one court would result in a policy loss and

review by another court would result in a policy gain, the judge is in a position in which the outcome of review is uncertain in that it can have either negative or positive consequences. We do not expect this context to be a good predictor of whether or not a judge will dissent (e.g., Hettinger, Lindquist, and Martinek 2004).

***** Table 3 About Here *****

Table 3 examines these expectations. We characterize three relevant regimes. In the first, review by both the Supreme Court and the circuit en banc would make a judge better off. In the second regime, review by one court would result in a policy gain, while review by the other court would result in a policy loss. In the third regime, review by both courts would result in a policy loss. Each column in Table 3 compares the probability of dissent by strategic context. Column 1 indicates that there is a 0.05 probability of dissent when review by both the circuit en banc and the Supreme Court would result in a policy gain to a judge. The probability of dissent is only 0.04 when this condition is not met. A two-sample test of the equality of proportions reveals that this is a statistically significant difference. Column 3 considers the opposite scenario. When review by both courts would be disadvantageous, dissent is less likely. The probability of dissent under these conditions is 0.04, compared to a probability of 0.05 in other strategic contexts. Column 2 reveals that there is no statistically significant difference in the probability of dissents in a regime in which review by one court would result in a policy gain and review by the other court would result in a policy loss. As predicted by the strategic dissent hypotheses, the strategic context in which a judge acts is systematically related to the presence of dissent. If, as predicted by a purely sincere account of dissenting behavior, the strategic context is irrelevant, the frequency of dissent should not co-vary with changes in the strategic context. Table 3 reveals, however, that it does. Among observations where there is dissent, 52% occur when review by both courts would be advantageous. This

percentage is higher than would be expected by chance as only 46% of observations in the data occur under this context.

While the evidence presented in Tables 2 and 3 and Figure 1 are consistent with strategic accounts of dissenting behavior on the courts of appeals, we prefer to rely on multivariate analyses for more conclusive results. For the reasons discussed in detail above, there are severe limitations in our ability to conduct a test that is not biased toward finding no evidence of strategic behavior. As such, the characteristics of our data lead us to propose a more focused test of the use of dissent as a signal that a case warrants review. To do this, we examine a subset of judges most likely to employ dissents: those that are ideologically isolated on their panels. The sample we evaluate here is substantially smaller than the one used in the preceding analyses since we consider only the behavior of the judge on each panel that is, by assumption, the most likely to dissent. Including multiple observations per case when only one dissent is usually possible introduces bias against the strategic hypotheses, so we argue that this test is theoretically appropriate, falsifiable, and, as importantly, verifiable.

We characterize appointees of Republican [Democratic] presidents as isolated when they are on panels with two appointees of Democratic [Republican] presidents. By focusing on isolated judges and considering one key characteristic of the strategic environment (the relationship between a judge and the ideological composition of the circuit), we are able to conduct a reasonable test of the strategic model. To characterize the strategic context in which isolated judges decide whether or not to dissent, we adopt the concept and operationalization of partisan regimes introduced by Giles et al. (2007). Giles et al. suggest that the ideological tenor of the circuits can be characterized by their partisan balance. Intuitively, we expect circuits with higher numbers of judges appointed by Republican appointees to be more conservative than those staffed by higher numbers of Democratic appointees. Given this, we include a *Judge in Circuit Regime* variable that indicates whether or not each

isolated judge shares the partisan identification of the majority of judges in their circuit. Republican [Democratic] judges in circuits where the majority of judges were appointed by Republican [Democratic] presidents are considered to be in the dominant regime and are thus scored 1. Conversely, Democratic [Republican] judges in circuits where the majority of judges were appointed by Republican [Democratic] presidents are scored 0.[9] The strategic hypothesis suggests that members of the controlling regime should utilize dissents to invite en banc review. Conversely, judges who are not in the controlling regime will not enjoy substantially improved policy if the circuit reviews the case. We therefore expect judges in the circuit regime to more frequently dissent for strategic reasons.

In addition to providing a reasonable test of the possibility of strategic dissents, this approach also allows us to control for a judge's ideological distance from the majority opinion author since the correlation between our *Judge in Circuit Regime* variable and the aforementioned *Ideological Distance* variable is only 0.03 (variance inflation factor = 1.0, tolerance = 0.99). By focusing on isolated judges, we can test both sincere and strategic explanations for dissents on the courts of appeals.

***** Table 4 About Here *****

Table 4 reports the results of a model examining the dissenting behavior of isolated judges. As with Table 1, the dependent variable takes on a value of 1 when a judge authored a dissenting opinion and 0 when he or she did not.[10] This model provides strong support for both sincere and

[9] The regime data were originally collected by Giles, Hettinger, Zorn and Peppers (2007) and extended by Blackstone and Smelcer (2006). We obtained information on the partisan affiliation of the appointing president for each judge in the data from Gryski and Zuk (2009).

[10] To account for the sampling composition of our data, we employ the weights reported in Kuersten and Haire (2009) and Songer (2009). In addition, we use robust standard errors, clustered on judge, to account for the non-independence of observations. We cluster on judge, instead of the case citation, since only one judge can appear per case in this sample.

strategic accounts of dissents on the courts of appeals. With regard to sincere accounts of dissenting behavior, we find that a one standard deviation increase in a judge's ideological distance from the majority opinion author increases the likelihood of dissenting by about 0.8%. More importantly, we find that judges who are members of the circuit regime are 1.6% more likely to dissent than judges who are not members of the dominant party in the circuit. Since judges who are not members of the dominant political regime in the circuit will presumably incur policy losses from en banc review, this provides further support for strategic characterizations of dissenting behavior on the courts of appeals. Thus, Table 4 provides evidence that judges respond systematically to the strategic context that accompanies change in partisan control of a circuit.[11]

CONCLUSIONS

Do judges strategically dissent on the courts of appeals for the purpose of inviting en banc or Supreme Court review? Existing studies of this topic are rife with contradictory findings, with some providing evidence of strategic dissents (e.g., Cross and Tiller 1998; Kim 2009; Van Winkle 1999), and others concluding court of appeals judges do not use dissents for strategic purposes (e.g., Hettinger, Lindquist, and Martinek 2004, 2006). The purpose of this study was to revisit the topic for the purpose of rectifying the conflicting nature of this debate. In so doing, we addressed the pitfalls associated with traditional econometric approaches to modeling strategic behavior, particularly relating to the introduction of multicollinearity into statistical models and the imprecise measurement of key concepts used to test strategic behavior. Further, in investigating alternative

[11] We also estimated a model to evaluate the hypothesis that isolated judges will use dissents to signal Supreme Court review. The Supreme Court had a majority of Democratic appointees for all observations in our data prior to July 12, 1975 when Lewis F. Powell, Jr. and William H. Rehnquist joined the Court. A Republican regime exists for all observations after that date. This model (results not reported) failed to provide evidence that isolated judges strategically dissent for the purpose of inviting Supreme Court review, likely due, in part, to the lack of variance in Supreme Court partisanship.

empirical implications of theoretical models of dissent, we have provided substantial evidence that court of appeals judges do indeed use dissenting opinions for the purpose of inviting further review of cases.

While our findings are consistent with those of Cross and Tiller (1998), Kim (2009), and Van Winkle (1997), who also evince that court of appeals judges dissent for the purpose of inviting further review of a dispute, we have done much more than replicate existing findings. Most scholarly research that considers strategic behavior in the courts of appeals laments the inconsistency of findings offering support or refutation of these intellectually appealing hypotheses. We have shed light on the causes of this confusion. Strategic behavior occurs in the courts of appeals, but, as strategic theories predict, the operation of strategic concerns is conditional and frequently there is equivalence between the predictions of sincere and sophisticated accounts of decision making (e.g., Lindquist and Martinek 2009). In part, this is a function of the fact that theories of sincere and strategic decision making agree that judges are motivated primarily by their policy preferences. Therefore, evidence that judges behave as predicted by sincere models does not eliminate the possibility that judges also engage in strategic behavior since strategic behavior should only manifest itself under specified conditions. Because strategic behavior requires opportunity and strategic considerations are sometimes assumed to be secondary to sincere policy preferences, tests of strategic theories must be carefully tailored to ensure that hypotheses are capable of being falsified and verified. By exploring in greater detail the primary frameworks used to evaluate hypotheses of strategic dissent, we have uncovered important features of popular research designs that introduce bias against strategic hypotheses, which allow us to make sense of the seemingly anomalous findings in extant research.

While we have focused on decision making in the courts of appeals, the arguments we advance have implications for research on strategic behavior in a host of subfields in political

science. For example, studies of separate opinion writing on the U.S. Supreme Court frequently pit strategic and sincere motivations against one another (e.g., Maltzman, Spriggs, and Wahlbeck 2000), while analyses of legislative behavior often concern themselves with strategic versus sincere voting, particularly in the presence of logrolling (e.g., Clinton and Meirowitz 2004). Moreover, work in the separation of powers tradition examines how members of one institution might behave strategically depending on the likely actions of actors in different institutions (e.g., Epstein and Knight 1998), just as strategic concerns regularly motivate the analysis of voting behavior in multi-candidate electoral systems (e.g., Cox 1984). Given the applicability of this work to these veins of research, and many others, we conclude by positing that scholars considering strategic interaction between any actors must carefully evaluate standard econometric research designs for inherent bias for or against their hypotheses. Multivariate regression analysis is a powerful tool and should remain a fundamental instrument for the rigorous analysis of social science theories. However, we should recognize its limitations. Some theories defy the requirements and expectations of large sample statistical analyses. In these instances, researchers may need to look beyond regression models to glean model implications that can be evaluated by alternative methods and considered alongside standard approaches to either corroborate or contradict statistical results. To be sure, robust theoretical models should be capable of generating numerous empirical implications. Our findings indicate that triangulation, be it through a variety of quantitative techniques, qualitative techniques, or a combination of the two, may best contribute to our understanding of the behavior of political actors.

APPENDIX

To maintain the substantive focus of the manuscript, the models reported in Table 1 do not contain control variables. Appendix Table 1 reports the results of models that include control variables identified in the existing literature to influence judge's decision to dissent (e.g., Hettinger, Lindquist, and Martinek 2003, 2004, 2006). Note that the inclusion of the control variables does not alter the results reported in the paper. Below, we briefly operationalize each variable reported in Appendix Table 1.

The first set of variables corresponds to attributes of judges that may affect the decision to dissent. Existing research indicates that judges who are new to the bench undergo a period of acclimation during which they are less able to devote time to authoring separate opinions (Hettinger, Lindquist, and Martinek 2003: 796). To capture this possibility, we include a *Freshman* variable, scored 1 if a judge was serving during his or her first two years of service and 0 otherwise (Gryski and Zuk 2009). In addition, chief judges may be less likely to dissent due to the myriad administrative responsibilities that place on a burden on their time and because they may seek to demonstrate norms of collegiality (Hettinger, Lindquist, and Martinek 2006: 52). We test this through the use of a *Chief Judge* variable, scored 1 for the chief judge of the circuit and 0 otherwise (Gryski and Zuk 2009). Designated district court judges serving on courts of appeals panels may be more likely to show deference to their colleagues by deferring to the majority (Collins and Martinek 2011; Hettinger, Lindquist, and Martinek 2006). As such, we include a *Designated Judge* variable, scored 1 for district court judges sitting by designation and 0 for regular court of appeals judges (Kuersten and Haire 2009; Songer 2009). Finally, we include two variables that capture a judge's status as a gender or racial minority. Some have suggested that minority judges bring unique life experiences to the bench that may cause them to view litigation differently than their white male counterparts, thus increasing the chances they will dissent (Hettinger, Lindquist, and Martinek 2003,

2004). To test this prospect, we include two variables. *Female* is scored 1 for female judges and 0 for male judges, while *Minority* is scored 1 for African American, Asian American, Hispanic, or Native American judges and 0 for Caucasian judges (Gryski and Zuk 2009).

Next, we include three variables based on attributes of the cases that are expected to influence the decision to dissent. Existing research indicates that, in cases with far reaching policy implications, judges are more likely to dissent (Hettinger, Lindquist, and Martinek 2003, 2004, 2006). Accordingly, we include a measure of *Salience*, adopted from Hettinger, Lindquist, and Martinek (2004: 132). This variable is a factor analysis of three cases attributes: the presence of amicus curiae briefs, the presence of a civil rights or liberties issue, and the exercise of judicial review (Kuersten and Haire 2009; Songer 2009). In addition, judges might be more likely to dissent in legally complex cases since cases with multiple issue areas provide ample opportunity for disagreement (Hettinger, Lindquist, and Martinek 2004, 2006). Our measure of *Legal Complexity,* adopted from Hettinger, Lindquist, and Martinek (2004: 132), is a factor analysis of the length of the majority opinion and the number of issues raised in the litigation (Kuersten and Haire 2009; Songer 2009). Finally, we control for whether the majority reversed the decision of the lower court. When this occurs, it is indicative that the case's outcome is far from clear since two courts, considering the same case, differed as to the outcome (Hettinger, Lindquist, and Martinek 2003: 799). *Reversal* is coded 1 if the court of appeals majority reversed the lower court decision and 0 if it affirmed that decision.

In addition to these judge and case-specific attributes, we also include variables relating to aspects of the circuit as a whole. First, we posit that judges serving in circuits with relatively large workloads will be less likely to have the time to devote to writing dissenting opinions (Hettinger, Lindquist, and Martinek 2003, 2004, 2006). Accordingly, we include a *Workload Pressure* variable, which represents the number of cases terminated on the merits per judge per circuit year (Hettinger, Lindquist, and Martinek 2004; Federal Judicial Center 2011; Scott 2006). In addition, circuit norms

might influence the decision to dissent. In circuits where authoring dissenting opinions is relatively common, we believe judges will be more likely to dissent (Hettinger, Lindquist, and Martinek 2003, 2004, 2006). Given this, we include a *Circuit Norm* variable, which is operationalized as the one year lag of the percentage of decisions with separate opinions for each circuit (Kuersten and Haire 2009; Songer 2009). Circuit size might also shape a judge's decision to dissent in that circuits with a relatively large number of judgeships create the potential for enhanced disagreement (Hettinger, Lindquist, and Martinek 2004, 2006). Our *Circuit Size* variable indicates the number of authorized judgeships for each circuit per year (Federal Judicial Center 2011). Finally, to control for any remaining circuit-level effects, we include a dummy variable for each circuit, save one.

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Table 1. Logit Models of a Judge's Decision to Dissent on the Courts of Appeals, 1970-2002

Model	I	II	III	IV
Ideological Distance	0.648* (0.122) [+0.88*]			0.841* (0.210) [+1.18*]
En Banc Policy Change		0.398* (0.121) [+0.56*]		−0.005 (0.185) [−0.01]
Supreme Court Policy Change			0.461* (0.128) [+0.62*]	−0.234 (0.245) [−0.28]
Constant	−3.362* (0.066)	−3.148* (0.042)	−3.144* (0.042)	−3.418* (0.082)
N	18,429	18,429	18,429	18,429
Wald χ^2	28.14*	10.75*	12.98*	30.28*

The unit of analysis is the judge-vote. The dependent variable indicates whether a judge authored a dissenting opinion (1 = dissenting opinion, 0 = no dissenting opinion). Numbers in parentheses indicate robust standard errors, clustered on case citation. Numbers in brackets indicate marginal effects. Marginal effects were calculated altering the variables of interest from the mean to one standard deviation above the mean, holding all other variables constant at their mean values. * $p \leq .05$ (two-tailed tests).

Table 2. Two-Sample Difference of Means Tests for Independent Variables for Dissenters and Non-Dissenters on the Courts of Appeals, 1970-2002

	Ideological Distance	En Banc Policy Change	Supreme Court Policy Change
Mean for Dissenters (N = 828)	0.436 (0.011)	0.139 (0.011)	0.112 (0.011)
Mean for Non-Dissenters (N = 17,601)	0.375 (0.002)	0.094 (0.002)	0.062 (0.002)
t-statistic	−5.603*	−3.064*	−4.514*

Numbers in parentheses are standard errors. * $p \leq 0.05$ (two-tailed tests).

Table 3. Frequency of Dissent by Strategic Context on the Courts of Appeals, 1970-2002

	Review by SC and EB Would Result in Policy Gain	Review by One Court Would Result in Policy Gain, Review by Other Court Would Result in Policy Loss	Review by SC and EB Would Result in Policy Loss
Context variable=1	0.050 (0.020)	0.042 (0.003)	0.040 (0.003)
Context variable=0	0.040 (0.004)	0.046 (0.002)	0.047 (0.002)
z-statistic	−3.403*	0.830	1.927†

SC = Supreme Court. EB = En Banc. Entries report the probability of dissent for different strategic contexts. Column 1 reveals that, when review by both the Supreme Court and the circuit en banc would result in a policy gain, the probability of dissent equals 0.05, compared to a probability of 0.04 when the condition is not satisfied. The z-statistic tests whether or not the difference between the two values in each row is statistically significant. Column 2 repeats this text for the strategic context in which review by one court would result in a policy gain and review by the other court would result in a policy loss. In column 3, the relevant strategic context variable is equal to 1 when review by both the Supreme Court and the circuit en banc would result in a policy loss. Numbers in parentheses are standard errors. * $p \leq 0.05$ (two-tailed test); † $p \leq 0.05$ (one-tailed test). N = 18,429.

Table 4. Logit Model of a Judge's Decision to Dissent When Isolated on the Courts of Appeals, 1970-2002

Variable	Coefficient
Ideological Distance	0.521* (0.317) [+0.79*]
Judge in Circuit Regime	0.269* (0.147) [+1.59*]
Constant	−3.151* (0.235)
N	4,100
Wald χ^2	5.74*

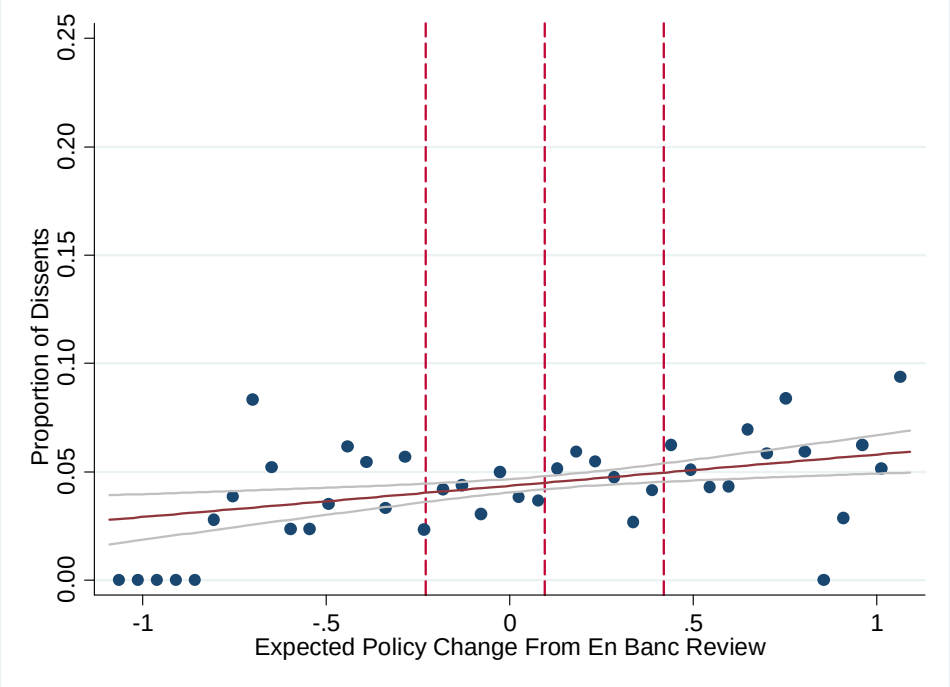
The unit of analysis is the judge-vote. The dependent variable indicates whether a judge authored a dissenting opinion (1 = dissenting opinion, 0 = no dissenting opinion). Numbers in parentheses report robust standard errors, clustered on judge. Numbers in brackets indicate marginal effects. Marginal effects were calculated altering the *Ideological Distance* variable from the mean to one standard deviation above the mean and the *Judge in Circuit Regime* variable from 0 to 1, holding all other variables constant at their mean or modal values, as appropriate. * $p \leq .05$ (one-tailed tests).

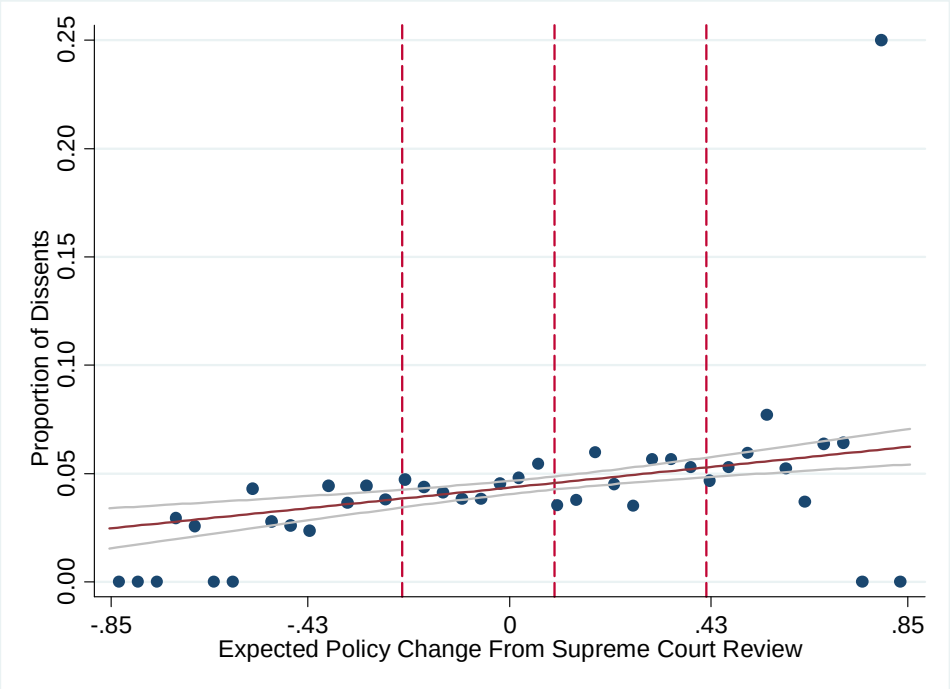
Appendix Table 1. Logit Model of a Judge's Decision to Dissent on the Courts of Appeals, 1970-2002

Model	I	II	III	IV
Ideological Distance	0.719*			0.897*
	(0.128)			(0.234)
En Banc Policy Change		0.431*		−0.051
		(0.121)		(0.185)
Supreme Court Policy Change			0.530*	−0.163
			(0.128)	(0.255)
Freshman	−0.321*	−0.333*	−0.342*	−0.312*
	(0.139)	(0.140)	(0.140)	(0.139)
Chief Judge	−0.331*	−0.327*	−0.317*	−0.337*
	(0.179)	(0.179)	(0.179)	(0.180)
Designated Judge	−0.464*	−0.443*	−0.453*	−0.471*
	(0.163)	(0.162)	(0.162)	(0.163)
Female	0.320*	0.344*	0.355*	0.308*
	(0.133)	(0.133)	(0.133)	(0.136)
Minority	0.069	0.102	0.113	0.054
	(0.145)	(0.145)	(0.145)	(0.146)
Salience	0.145*	0.144*	0.144*	0.145*
	(0.039)	(0.039)	(0.039)	(0.039)
Legal Complexity	0.013	0.017	0.018	0.012
	(0.041)	(0.044)	(0.045)	(0.041)
Reversal	0.392*	0.388*	0.390*	0.393*
	(0.084)	(0.083)	(0.083)	(0.083)
Workload Pressure	0.00001	0.0001	0.00003	0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Circuit Norm	1.405*	1.378*	1.382*	1.412*
	(0.527)	(0.525)	(0.526)	(0.526)
Circuit Size	−0.029*	−0.029*	−0.028*	−0.030*
	(0.016)	(0.016)	(0.016)	(0.016)
Constant	−3.006*	−2.802*	−2.800*	−3.052*
	(0.246)	(0.240)	(0.240)	(0.250)
N	18,429	18,429	18,429	18,429
Wald χ^2	214.97*	194.16*	198.44*	218.07*

The unit of analysis is the judge-vote. The dependent variable indicates whether a judge authored a dissenting opinion (1 = dissenting opinion, 0 = no dissenting opinion). Numbers in parentheses indicate robust standard errors, clustered on judge. Models include eleven circuit dummy variables (results not shown). * $p \leq .05$ (one-tailed tests).

Figure 1. Scatterplots of the Average Proportion of Dissents by Policy Change From En Banc or Supreme Court Review





These graphs represent the conditional mean proportion of dissents by the expected policy change from en banc (top graph) or Supreme Court (bottom graph) review. The solid red lines signify the fitted proportion of dissents, while the solid gray lines indicate 95% confidence intervals. The red dashed vertical lines report one standard deviation below the mean, the mean, and one standard deviation above the mean, respectively, for the policy change variables. The circles represent the observed mean proportion of dissents across the range of the x-axes.