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The Effect of Ideology and Resource Advantages on Appeals to the U.S. Supreme Court

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ABSTRACT

Scholars examining the relationship between the federal appellate courts and the U.S. Supreme Court have heretofore explored a myriad of explanations for how the Supreme Court determines which cases it will accept for review, including the ideological relationships between the justices and the circuit judges (and courts) and the resource statuses of the petitioning and responding parties. What scholars have overlooked is why some litigants appeal to the Supreme Court at all, given the low rate of review by the Court and the high costs (financial and otherwise) of an appeal. Scholars have also overlooked how changes in these relationships over time, and across circuits, affect the rates of appeals in the aggregate. I hypothesize that greater ideological disagreements between the circuits and the high court increase the rates of appeals over time, and I hypothesize that increases in the resource divide between the "haves" and "have nots" will depress appeals over time.

KEYWORDS

Federal courts; resource advantage; litigants; time series; appeals

Introduction

If someone is convicted based on evidence obtained during an illegal search, or if they are injured due to a defective product, or if they believe that they were fired because of their race or gender—that person wants to win in court and receive legal satisfaction (release from prison, a significant fine against the offending company, etc.). Consequently, litigants losing in the federal courts of appeals (even those who lost at both the trial and appellate levels) should seek a redress of their grievances through an appeal to the U.S. Supreme Court. However, this logic belies reality: of the over 50,000 decisions by the circuit courts per year, fewer than 8,000 cases are appealed to the Supreme Court, and fewer than 80 of these appeals will be granted *certiorari*.[1]

Despite the long odds of a successful petition, thousands of litigants still petition the Court for a review of the lower court decision[2] each year—including those litigants with fewer resources (financial or otherwise) than others. The literature heretofore has examined individual case reasons litigants appeal to the Supreme Court, and why the justices accept some of these petitions but not others, but with so many cases appealed—and so few granted review—the circumstances of the individual cases fail to address the question of whether litigants attune themselves to the changing litigation trends in the federal system. The question thus remains: Do strategic litigants respond to changes in litigation trends over time?

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[1]See https://www.supremecourt.gov/faq.aspx; http://www.nytimes.com/2009/09/29/us/29bar.html?_r=0.

[2]There are several ways in which the Supreme Court may review a lower court decision, but the focus of this study is on the most common form of review: a writ of *certiorari*.

The purpose of this study is to explore the changing relationship between the different federal judicial actors over time—specifically the relationship between litigants, federal appeals courts, and the U.S. Supreme Court—and how these macro-level changes potentially serve as cues for more appeals to the Supreme Court. I posit that there are two significant factors affecting increases and decreases in appeals over time and across circuits: the changing ideological characteristics of the courts and the changing resource divides among the litigants. As circuits' preferences depart from the preferences of the high court over time, appeals will increase, and as the resource gap—defined as the ability of a litigant to hire a more prominent or more experienced legal team and to otherwise possess the capability to more readily sustain a presence in an appellate proceeding (Galanter 1974; Songer, Sheehan, and Haire 1999; Black and Boyd 2012)—between the "haves" and the "have nots" increases over time and across circuits, appeals will decrease.

Litigant appeal strategies

It is erroneous to assume advantaged litigants who lose in the circuit courts will always appeal. In situations in which the "have nots" win, there is the risk to the "haves" that an appeals court will uphold the lower court decision, creating an adverse precedent for the advantaged litigant. Consequently, this litigant will either settle with the less advantaged litigant or will cut its losses and avoid an appeal altogether (Cross 2003). In this way, the resource advantage by litigants may reduce appeals, because these litigants have greater knowledge of the ideological and policy proclivities of the justices and use those benchmarks to determine whether to appeal a lower court decision (Galanter 1974; McGuire et al. 2009; Yates and Coggins 2009). The consequence of this knowledge is that even those litigants who win at the circuit level may be more willing to settle with the less advantaged litigants, if there is a significant possibility that the Court will not only grant review but also overturn the circuit decision. Similarly, more advantaged litigants who lose at both the original jurisdiction and appellate levels may be less likely to appeal because if the lower court decisions are affirmed by the Court, the precedent becomes binding for the entire country—harming future litigation by repeat players.[3]

Strategic litigants calculate several factors, in determining whether to appeal an adverse lower court decision. One factor is the signals sent by the justices themselves, based on recent case law. For example, although the moray of the judiciary is never to state explicitly how a judge will rule in a specific situation, judges can use dissents and concurrences to signal that they will rule a different way under certain circumstances (e.g., "Had the search transitioned from the basement to the upstairs, this court would be more hesitant to consider the search valid") (Jacobi 2008). Another factor is the likelihood of success should the case be reviewed, which is measured as both the likelihood of review and the likelihood of success on the merits (Davis and Songer 1988–89; Songer, Cameron, and Segal 1995; Black and Owens 2013). There are two transaction costs litigants calculate in deciding whether to appeal an unfavorable lower court decision: the cost of judicial services (briefs, attorneys, etc.) and delays in resolution (the longer it takes to receive a ruling, the lower the utility by the prevailing litigant) (Posner 1985; Barclay 1997). In addition, there is the likelihood of victory: if litigants are not likely to win—or if there is the serious risk that their opponent will be successful—they will either give up (if the litigants lose in the lower court) or settle (either litigant) (Cross 2003; Brace, Yates, and Boyea 2012). More resource-advantaged litigants are more likely to be successful in part because they can make a more accurate determination of their likelihood of success on appeal, and they can absorb the

[3]This same calculus applies to less advantaged litigants: if less advantaged litigants lose in both lower federal courts, there is a greater likelihood that they will cut their losses and end the judicial proceedings, as they (by definition) lack the resources to play the long game, and they already have two losses against them.

transaction costs better (McGuire et al. 2009; Yates and Coggins 2009; Brace, Yates, and Boyea 2012).

The degree of advantaged litigant success in appealing successfully to the Supreme Court may be further mitigated by the ideological position of the justices: Black and Boyd (2012) found that the likelihood of Supreme Court review is affected by the ideology of the justices: more liberal justices tend to favor "underdog" (black employees claiming discrimination, etc.) petitioners because these litigants often represent ideological positions favorable to more liberal justices (expansion of civil rights protections, etc.), while more conservative justices favor more advantaged petitioners. Alternately, a less advantaged petitioner seeking an outcome different from the ideological position of the justices may not receive as favorable a consideration. The consequence of ideology is that victory by a group is contingent on whether their preferred outcome meshes with the majority on the Court, regardless of their degree of resource advantage over the other group.

The product of these different accounts is that strategic litigants pay attention not only to their specific case but also to the overall ideological and litigation trends across time and across other circuits. If strategic litigants believe that the Court is becoming more conservative, for example, then even advantaged litigants will hesitate to appeal if they believe unfavorable circuit outcomes are in ideological directions congruent with the contemporary Court. Alternately, if strategic litigants believe that their circuit of origin has moved in an ideological direction antithetical to that of the Supreme Court, then litigant appeals will increase (assuming unfavorable outcomes), based on the belief that the Supreme Court is paying close attention to the litigation emerging from the offending circuit. Furthermore, higher rates of disagreement between the district and circuit courts indicate that there are fewer litigants who have lost in both lower courts—making petitions more attractive because litigants can provide an additional sign that they possess a "better" case for the Court to review. The sum consequence of these considerations is more appeals will spring forth from a particular circuit over time.

Signaling and Supreme Court–circuit court interactions

One of the most important elements that litigants can provide to the Supreme Court is why the Court should pay more attention to certain appeals than others, and a key method for alerting the Court is from the signals sent by the circuit courts. The Supreme Court is very selective in the lower court cases it reviews, due to a belief among justices that too much review of a circuit weakens the legitimacy of that court (Ulmer 1984; Klein and Hume 2003). Consequently, justices seek certain cues as to which lower court decisions warrant attention. The effect in the aggregate is that justices should pay attention to changes over time in the cues sent by the circuit courts—cues that will be highlighted by strategic litigants during an appeal. In the aggregate, I posit that the principal signals for justices' decisions regarding *certiorari* are both the contemporary conditions of the federal judiciary and the previous conditions of the judiciary.

One important macro-level signal in whether the Supreme Court will review a lower federal court more than others is a change in the ideological composition of the circuits. Presidents and senators appoint judges in part on the basis of whether the judge will make decisions in line with the president or senator's favored policies, and there is evidence that circuit judges are more predictable than their Supreme Court counterparts, in terms of ideologically consistent voting patterns (Giles, Hettinger, and Peppers 2001; Epstein, Landes, and Posner 2013).[4] If the ideological preference gap between a circuit court and the Supreme Court is increasing, then the Court will

[4]The literature is far from conclusive, however: Kaheny et al. (2008), for instance, found that as judicial careers progress, judges undergo changes in their policy preferences (at least through their mid-career period). Future research will seek to develop a measure of ideology that will determine whether judges' preferences are static or dynamic over time.

use this gap as a cognitive shortcut for determining the overall preferences of the circuit (Lindquist, Haire, and Songer 2006) and increase its audits of a circuit because the Court has no reason to trust the signals sent by that court (Scott 2006b; Black and Owens 2012). Consequently, the Supreme Court views shifts in the median judge on a circuit over time as indicative of cumulative changes in the decision-making of the overall circuit, and if this change is in a direction in sync with the Court's preferences, a circuit is less likely to be monitored closely, and vice versa. If strategic litigants find evidence of an aggregate shift in either circuit or Supreme Court preferences, and litigants believe these shifts will favor their policy preferences, appeals will increase because the odds of a successful appeal have increased.

Gaps in literature

Although the scholarship regarding appeals is legion, significant deficits in scholarship remain. One significant gap in scholarship is the longitudinal study of appeals. There are several studies examining the relationship between the circuit courts and the Supreme Court over time (Songer, Sheehan, and Haire 1999; Westerland et al. 2010), but these studies use pooled cross-panels rather than time series, and these studies do not account for the theoretical effects of changing trends. The drawback to conducting this type of analysis is that the nature of the relationship between two variables may be misconstrued because of shocks to these relationships (Sobel and Coyne 2011). Similar to this concern regarding the need for pooled time series analysis is the fact that not all circuits are created equal: circuit size (Scott 2006a), past audits of circuits (Klein and Hume 2003), and collegial norms (Lindquist, Haire, and Songer 2006; Kastellec 2011) are different for each circuit. As a consequence, longitudinal analysis without consideration of these differences is likely to downplay the different ways in which litigants and the Supreme Court decide on how to proceed with a lower court decision. This downplay is problematic because we are not only failing to account for changes in judicial behavior across time but also failing to account for changes in how the Supreme Court and the individual circuits interact with one another over time.

One reason to examine the data at the macro level, as opposed to testing the hypotheses at the individual case level, is such an examination lends potential credence to the notion that more advantaged litigants have greater success. If, in deciding whether to appeal, strategic litigants examine the metaphorical forest of general litigation trends, as opposed to the metaphorical trees of the individual case at hand, then the litigants' counsel should be conscious of trends in litigation coming from other circuits, as well as litigation trends from previous years[5] and the proclivities of both the circuit judges and the Supreme Court justices, and accurately determine whether a definite loss at the circuit level is preferable to either a rejection of a *certiorari* petition or a loss in the Supreme Court. Additionally, strategic interest groups seek cases for which victory is likely, and as a consequence litigant success over time may hinge on bringing cases in circuits to which the Supreme Court has paid closer attention. Although the types of cases appealed to the Supreme Court are of great importance to strategic litigants, there may be an understanding that the likelihood of success on appeal is at least somewhat dependent on how closely the Supreme Court has monitored a circuit in the past. Furthermore, if the resource advantages of the litigants matter independent of other concerns, then litigant advantage should matter regardless of individual case characteristics.

Another reason to examine macro-level trends is because of shifts in ideology in the circuit courts. Although the courts have become more conservative overall, this trend differs across circuits, in terms of extreme direction, how long it takes for the ideological median of a circuit to shift, and the appointments made by different presidents or senators. If ideology matters, then it

[5]I have no formal theory as to how far back litigants follow litigation trends, but the conclusions of the unit root tests suggest that the relationship between appeals and losses by advantaged litigants is stationary up to three years onward.

should matter regardless of the individual characteristics of a case; the Supreme Court should examine the circuit as a whole. This theory is justified by the work of Scott (2006a), who finds that the reversal of circuit decisions by the Supreme Court is partially the product of the ideological distance between the entire circuit and the Court, as opposed to the individual panels and the Court.

A final reason to examine decision-making at the macro level lies in changes in rates of dissent and changes in circuits' reversals of lower courts over time. If one of the preferences of the Supreme Court is uniformity in law, then the Court should be concerned if there is an increase in non-unanimous decisions coming from the circuit, or if circuits begin reversing the trial courts at greater rates. There is also the possibility that these changes affect the decision of litigants to appeal to the Court, as more advantaged litigants may have enough experience and resources to observe these changes across the federal courts—influencing the likelihood of filing an appeal for *certiorari*. Examining these changes provides further control for the differing ideological and resource advantage factors in the circuits: the justices may be responding more to an increase in dissensus in a specific court, rather than any changes in litigant resources or policy preferences.

Data and methods

Source of case data

For the case data from 1983 to 2002, I use the Shepardized version of the Songer (1996) U.S. Court of Appeals Database (Solberg 2010). Although the COA Database begins in 1925, I choose to begin the analysis in 1983 because this year was the first full year of the current structure of the federal appellate court system. The Shepardized database contains the complete case history of the appeals court cases in the database, including whether the case was appealed to the Supreme Court and whether the Supreme Court granted review. The COA database consists of a weighted[6] random sample of approximately thirty cases per circuit per year. However, I want to account for recent case developments in the courts of appeals, as well as account for the totality of the Rehnquist Court, so I followed the sampling procedure outlined by Songer (1996): I used the LexisNexis database to compile a spreadsheet of all appeals court decisions published in the *Federal Reporter*, imported the spreadsheet into STATA, and compiled a weighted random sample of cases for each circuit for the years 2003–2009. After generating the random sample, I proceeded to use LexisNexis Advanced to gather information about the case, including any subsequent history.

Ideally, each circuit should have at least one case per year appealed to the Supreme Court. Failure to have at least one case appealed for each circuit makes cross-circuit analysis extremely difficult because of missing data.[7] Every circuit in every year did have at least one appeal to the Supreme Court, but the sampler did not always select these cases. Alternately, a case selected by the sampler may have been discarded because the case failed to comply with the criteria for case selection in this research (i.e., the circuit decision was unpublished). Consequently, if a circuit lacked at least one case appealed for *certiorari*, I proceeded to search the spreadsheet or Lexis, find the requisite number of appropriate cases, and replace one or more of the cases in the random sample with these more appropriate cases.[8] As a result, each circuit in the sample has at least one case appealed to the Supreme Court in every year.

[6]The weights are designed to make sure the larger circuits are not overrepresented.

[7]Admittedly, the likelihood of biased estimators given missing data is comparatively low, since there is no indication that any of the missing data were correlated with idiosyncratic errors (Wooldridge 2013). Having issued this caveat, and after balancing the low likelihood of biased estimators with missing data with the need to have a representative *N* in the *certiorari* model, I proceeded to use Lexis Advanced to search for decisions to include.

[8]This decision was not made lightly, given that purposeful replacement can lead to selection bias. However, the risk for not substituting was years in which circuits did not have any cases appealed to the Supreme Court. Furthermore, I only substituted cases 26 times across all years and circuits. Given the *N*s, the likelihood of a selection effect is minuscule.

Source of litigant data

In order to obtain a proper assessment of litigant advantage, I used the LexisNexis Advanced Database. The advantage this database has over the general LexisNexis database is that the Advanced Database contains background information on the attorneys representing each side in the case. As a consequence, I am able to obtain information regarding an attorney's case history, how often he or she has argued before the federal appeals court in question, and the areas of expertise for the attorney. In the absence of information on the specific attorney, I use the law firm in question as a proxy and examine the characteristics of that firm (how many cases the firm's attorneys have argued before the circuit, etc.). If one or all of the parties have multiple attorneys and firms, I examine all of the attorneys or firms.

There are five categories of litigant counsel: public, private, interest group, state governments, and the federal government. Litigants represented by the federal government are assumed to be the most advantaged litigants in all cases, because the federal government is the most likely to have the highest resource capacity, as well as the most experienced attorneys and the greatest knowledge of a case and its corresponding precedents and law. Conversely, individuals represented by "public" counsel (legal aid societies, pro se, etc.) are assumed to be the least advantaged in all cases, as these parties have the lowest resource capacity, often less experienced attorneys, and attorneys with the least knowledge of a case and corresponding precedent and law.[9]

I define an interest group as an organization litigating cases for the purpose of furthering a public interest, in terms of public policy. Because interest group organizations generally have much higher resource capacities than public counsel, interest group representation is assumed to be superior to public representation.[10] However, not all interest groups are created equal. For example, in a dispute between the AFL-CIO and the Pacific Legal Foundation, the litigants represented by the AFL-CIO Lawyers Coordinating Committee are classified as having superior counsel, even though the Pacific Legal Foundation is a high-capacity interest group because the AFL-CIO LCC is a more experienced organization with a larger operating budget. The default is to measure advantage based on the parties' counsel rather than the parties themselves because it is counsel that argues the case.[11]

Methodological approach

As previously mentioned, there are precious few studies examining different changes in the circuit courts over time and their effects on appeals. While the circuits do share the same structural characteristics, the extant literature demonstrates that it is erroneous to assume homogeneous normative characteristics (ideology, etc.) or a similar rate of change in characteristics of each circuit. Consequently, the appropriate statistical method to test the hypotheses is time series cross-sectional, or pooled time series. By using pooled time series, the different changes—and rate of change—for each circuit can be ascertained, as well as differences in those effects on appeals to the Supreme Court and the granting of *certiorari*. Because the analysis is pooled time series, the temporal unit of analysis is the calendar year in which the case was decided at the appeals level, and the cross-sectional unit of analysis is the twelve circuit courts. The original data are collapsed based on the means of the variables for each circuit in each year. The population of federal

[9]In determining who represented each party, I follow the Songer (1996) assumption and code a counsel as "private" unless indicated otherwise. I also assume that federal counsel represents all federal agencies and officials who are parties in their official capacities.

[10]Per the Songer (1996) classification, counsel for labor unions are classified as interest group representation.

[11]The Supreme Court does not list the attorneys filing petitions on behalf of litigants. Consequently, I cannot account for whether a different attorney or firm represented the petitioning and responding parties. I assume that the same attorney(s) representing the litigants in the appeals court represented the litigants at the petitioning stage, with the exception of the federal government, in which case I assume the Solicitor General is filing.

circuit court decisions for this time period is 8,426, with 2,135 of those decisions appealed to the Supreme Court. I then proceed to collapse the data in both the appeals and *certiorari* by circuit and year (using the mean values for the germane variables), for a final sample *N* of 312 (12 circuits × 27 years, with 12 degrees of freedom).

There are two reasons I choose a lagged dependent variable (LDV) model to conduct the analysis. I posit that litigants and Supreme Court justices use values in the previous years as predictors for values in the current year. By failing to use lags, I ignore the theory that judicial actors look to the (immediate) past to predict the future. The second, more methodological reason is the superiority of the LDV model over traditional Ordinary Least Squares (OLS) and Feasible Generalized Least Squares (FGLS) regressions. OLS assumes the error variances are the same and the error processes are independent of one another over time (Beck and Katz 1995), but it is not unreasonable to assume that error variances are different over time, if for no other reason than the changing memberships on both the lower courts and Supreme Court likely impact decision-making on the part of judicial actors, and it is also reasonable to assume that what happens at time t affects what happens at time t + 1—making the error terms not completely independent. Using FGLS is problematic because I am examining a comparatively small data set, and FGLS estimates numerous parameters—potentially eliminating results altogether (Beck and Katz 1995). Consequently, LDV is the optimal solution.[12]

Theory and hypotheses

The theory that more resource-advantaged litigants are more successful than their less advantaged counterparts is well-established: the resource advantages of the litigants influence the decision to appeal to the Supreme Court and whether the Court grants *certiorari* because more advantaged litigants have the resources and financial capabilities to pursue appeals to the highest court in the land, and more advantaged litigants have the resources and financial capabilities to hire the legal staff best able to overcome the tendency of the Supreme Court to deny *certiorari*. Because less advantaged litigants are theoretically cognizant of the other side's advantages, they will be less likely to appeal to the Supreme Court because resource-deficient litigants are less likely to overcome the aforementioned barrier. What is left unanswered is whether—and how—the relationship between the "haves" and "have nots" changes over time. I posit that the resource "gap" between litigants is growing over time because of changes in the cases being heard in the federal court system. As shown in Figure 1, criminal appeals increased precipitously between 1989 and 1991 and overall consistently constituted approximately one third of all appellate cases heard during this time period. Although they constituted the majority of cases appealed to the circuit courts, the percentage of labor and economic cases heard by the appeals courts consistently declined during this time period, such that by 2007 criminal appeals came to consist of the largest single portion of federal appeals court cases heard. Because the cases likely to feature the greatest gap between the "haves" and "have nots" are increasing, the resource gap between litigants should increase over time as well.

Before examining the resource gap between litigants, I turn my attention to measuring litigant resource status. Collins (2008) and Black and Boyd (2012) provide a foundation for the measurement of litigant resource status. Both studies used a nine-category measurement of litigant resource status, with poor individuals rated as possessing the fewest resources and the federal government as possessing the most resources. Although not inaccurate overall, this measurement

[12]Determining the appropriate number of lags is more of an art than a science, given the dearth of longitudinal studies in the literature. I ran initial models with up to five lags and found that the one-lagged models produced better results, both in terms of avoiding problems with autocorrelation and in terms of the substantive results. Therefore, the final analysis uses a one-year lag for all variables.

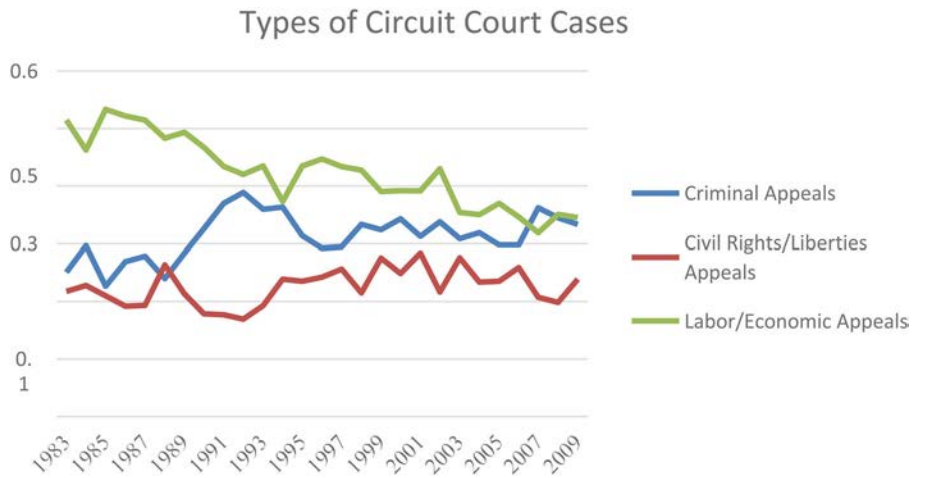

Figure 1. Types of federal circuit cases, 1983–2009.

Table 1. Resource advantage scores.

Litigant	Counsel	Score
Person	Public	1
Person	Private	2
Business	Public	3
Person	Interest Group	4
Association	Private	5
Local	Private	6
Association	Interest Group	7
Business	Private	8
Business	Group	9
Person	State	10
Person	Federal	11
State	Private	12
Local	State	13
Business	State	14
Business	Federal	15
State	State	16
State	Federal	17
Federal	Federal	18

does oversimplify resource advantage by failing to account for the different types of counsel arguing cases and how that might affect the resource gap. As previously stated, an individual represented by, for instance, the ACLU is not going to be as disadvantaged against the government as someone proceeding *pro se*. My solution is to employ the same methodological concept as Collins and Black and Boyd but expand the categories and use a combination of the litigating party and the litigants' counsels to calculate a score for litigant advantage, as outlined in Table 1.[13] Values range from 1 to 18, with a score of 1 indicating the least amount of resources and a score of 18 indicating the highest amount of resources. After generating scores for the appeals' courts appellants and appellees, I take the differences between the appellees' scores and appellants' scores to obtain a measure of net litigant advantage, as outlined in Table 2. Negative scores indicate the appellant was more advantaged, and positive scores indicate the appellee was more advantaged. In the aggregate, the value for net advantage is the mean score for a circuit in a given year.

[13]The counsel for circuit appellants is designated by the first counsel variable in the dataset ("counsel1"), and counsel for circuit appellees is designated by the second counsel variable in the dataset ("counsel2").

Table 2. Frequency distribution of differences in litigant resource advantages (non-aggregate).

Resource Advantage Difference between Appellees and Appellants	Frequency	Percent	Cumulative Percent
−17	62	.74	.74
−16	256	3.04	3.78
−15	27	.32	4.09
−14	127	1.51	5.60
−13	41	.49	6.09
−12	18	.21	6.30
−11	70	.83	7.13
−10	156	1.85	8.98
−9	20	.24	9.22
−8	29	.34	9.57
−7	22	.26	9.83
−6	348	4.13	13.96
−5	16	.19	14.15
−4	112	1.33	15.48
−3	90	1.07	16.54
−2	61	.72	17.27
−1	30	.36	17.62
0	642	7.62	25.24
1	37	.44	25.68
2	78	.93	26.61
3	140	1.66	28.27
4	237	2.81	31.08
5	64	.76	31.84
6	995	11.81	43.65
7	59	.70	44.35
8	69	.82	45.17
9	17	.20	45.37
10	579	6.87	52.24
11	174	2.07	54.31
12	52	.62	54.93
13	192	2.28	57.20
14	280	3.32	60.53
15	168	1.99	62.52
16	2,298	27.27	89.79
17	860	10.21	100.00

Having established the appropriate measurement, let us turn our attention to the theory of how the resource gap affects appeals to the Supreme Court. Figure 2 portrays the aggregate change in the resource gap between litigants over time, and Table 3 summarizes the number and percentages of times the more resource-advantaged litigants won in the courts of appeals. Overall, more advantaged litigants were the most likely to be appellees (meaning that these litigants won in the trial court in the court of appeals), and the more advantaged litigants achieved at least a partial victory in over 75 percent of cases. As shown in Figure 2, the resource gap between circuit appellees and appellants (meaning they lost in the trial court) over time does increase. These statistics lend support to the theory that litigant resources do matter in terms of both the lower court outcome and appeals to the Supreme Court and that the growth in the resource gap over time may significantly depress appeals to the Supreme Court over time.[14] Because strategic litigants are cognizant of the difference in resources between themselves and the other party, strategic litigants will be less likely to appeal to the Supreme Court if the resource gap between the two parties is significant,[15] and the aggregate

[14]There is also the possibility that appeals decrease because one side simply does not have a compelling case. Due to the limitations and the aggregate nature of the data, however, I am unable to measure the "quality" of an individual case.

[15]Previous studies make no claims as to what constitutes a "significant" gap, and I also take no position on the definition of "significance."

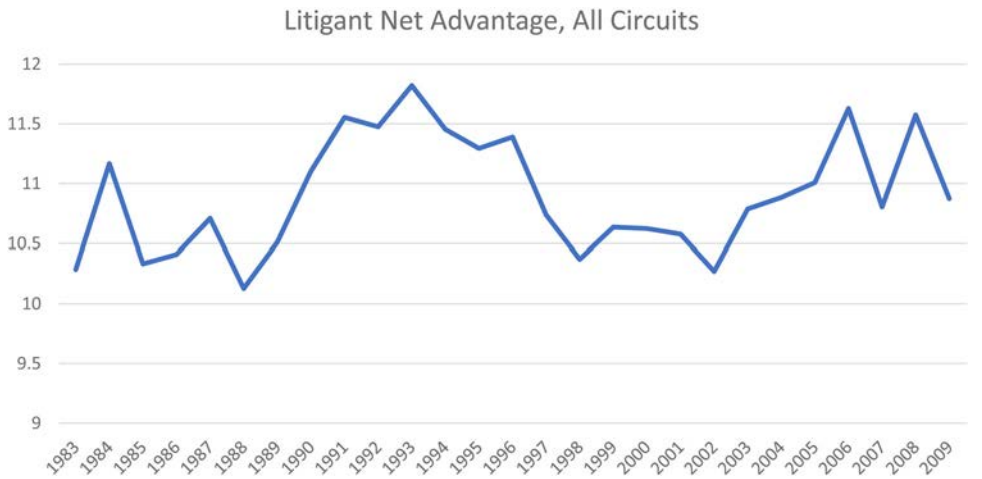

Figure 2. Net advantage between circuit court appellees and appellants, all circuits – 1983–2009.

Table 3. Summary of which side is more advantaged and times of victory.

Which Litigant More Advantaged?	Did Advantaged Litigant Win in Appeals Court?			
	Yes	Mixed	No	**Total**
Appellee	4,377 (65.10%)	715 (10.63%)	1,632 (24.27%)	**6,724 (79.80%)**
Appellant	819 (48.12%)	220 (12.93%)	663 (38.95%)	**1,702 (20.20%)**
Total	**5,196 (61.67%)**	**935 (11.10%)**	**2,295 (27.24%)**	**8,426 (100.00%)**

gaps between the litigants in the circuit courts will decrease appeals to the Supreme Court over time.[16]

H_1: As the resource gap between the litigating parties increases, *certiorari* appeals decrease.

Resource advantages are not the only effect regarding how appeals and *certiorari* decisions are made. The ideological differences between the circuit judges and the Supreme Court justices matter as well. Supreme Court justices use ideological change at the court of appeals level as a signal regarding whether to pay closer attention to the decision outputs of a particular circuit, particularly when the ideological direction of the circuit's output is in a direction less tolerable to the majority on the Court (Cameron, Segal, and Songer 2000; Scott 2006a, 2006b; Lindquist, Martinek, and Hettinger 2007). I consequently posit that both strategic litigants and justices pay attention to both the difference between how a circuit should rule (given the median judges) and how a circuit does rule (given the mean direction of the final case outcomes), and the difference between the policy preferences of the median circuit judge and the median Supreme Court justice. The difference between the ideological composition of the appeals court and its decisions in a given year matters to litigating parties because these actors observe general litigation trends beyond the immediate case, assuming most of these actors are strategic, and I posit that greater variation between court composition and ideological output is part of these trends. If a traditionally liberal appeals court is making conservative case decisions, Supreme Court justices are less likely to grant review (Kastellec 2011)—meaning that strategic (and more resourced) parties will reduce appeals to the Supreme Court because the likelihood of *certiorari* is declining.

[16]Alternately, appeals to the Supreme Court decrease as resource inequality rises because strategic advantaged litigants choose to settle rather than risk a successful appeal by the "underdog," as such an outcome would be binding for the entire country (Cross 2003; Brace, Yates, and Boyea 2012).

H_2: As the distance between the median circuit judge and the mean direction of the circuit's decisions increases, appeals to the Supreme Court increase.

H_3: As the ideological distance between the median circuit judges and the median Supreme Court justice increases, appeals to the Supreme Court increase.

Having established the theoretical basis for my ideology hypotheses, I shift the reader's attention to conceptualizing ideology. There are several choices available for measuring the policy preferences of both circuit judges and Supreme Court justices, such as the ubiquitous Judicial Common Space scores developed by Epstein et al. (2007) and the ideological direction measures employed in the Spaeth et al. (2015) Supreme Court Database.[17] However, the JCS scores for circuit judges may be flawed because the scores for circuit judges are fixed at the point in time that a person becomes a judge, despite evidence suggesting that circuit judges do change their ideological orientation over time (Kaheny, Haire, and Benesh 2008; Ho and Quinn 2010).[18] As for the ideological direction measure, there are serious concerns about confirmation bias and oversimplification in the conceptualization of "liberal" and "conservative" decisions (Harvey and Woodruff 2013; Bailey 2013). Consequently, I employ a somewhat novel method. I first derive the average ideological direction of a circuit's decisions (rated on a -1 to $+1$ scale, with positive values equaling more conservative decisions). I then take the difference between that average and the average JCS scores for the median judges on a circuit's panels in that year to obtain the final ideological score for a circuit in a given year. The values for this variable range from -1 to $+1$, with positive values equaling a more conservative court on average.

Although measuring the gap between the policy preferences of the appeals courts' median judges is a promising measurement, there is still the aforementioned problem of case direction classification. There is also the possibility that greater distance between the preferences of the lower court judges and the preferences of the Supreme Court justices give the justices less desire to "trust" the signals being sent by the lower court, regardless of the outcome of the individual case (Black and Owens 2012). Therefore, I employ a second measure of circuit-Supreme Court ideology: the distance between the JCS score for the median Supreme Court justice in a given year and the JCS scores for the median circuit court judges on the panels in each circuit in each year. The JCS scores for each median judge and justice range from -1 to $+1$, with positive JCS scores indicating that a justice or judge is more conservative, and negative JCS scores indicating that a justice is more liberal (Epstein et al. 2007). I then take the difference between the median justice and median judge to produce a distance score, ranging from -1 to $+1$. A negative score indicates that the median justice was more liberal than the median panel judges in the circuit, while a positive score indicates the median justice was more conservative than the median panel judges.

Dependent variables

There is one dependent variable in this study: whether a case is appealed to the Supreme Court. In the initial dataset, this variable is coded "0" for not appealed and "1" for appealed.[19] When collapsed by the mean, the dependent variable becomes the average rate of appeals for each circuit in each year. The higher the mean, the more appeals there were for a circuit in a given year.

[17]The GHP scores are the second dimension of the Poole and Rosenthal (2000) common space scores for the appointing presidents or senators.

[18]The evidence for ideological drift on the part of circuit judges is still relatively new; however, Epstein et al. (2013) write that the ideological voting patterns of circuit judges are more predictable than their Supreme Court counterparts.

[19]For the sake of simplicity, "appealed" is interpreted broadly: if the original issue in a case was petitioned to the Supreme Court at any time without returning to the circuit court (i.e., after a remand to the district court), it was classified as appealed; cases in which both parties appealed to the Supreme Court were classified as the original appellant making the appeal.

Table 4. Appeals to the Supreme Court over time.

N	312
Wald χ^2	78.35
Prob $> \chi^2$	0.000

Control variables

Because the median justice theoretically represents the majority of justices, the median justice is considered an influencing factor on decisions to appeal to the Supreme Court. I posit that the median justice is integral in gaining the minimum four votes necessary for *certiorari* to be granted. This position is based on the logic that the median justice may be the deciding factor in whether four votes emerge, just as the median justice is the theoretical reason a majority emerges in close decisions, and justices will not vote to grant *certiorari* unless they are reasonably certain they have the requisite number of votes to achieve a victorious outcome (Segal 1986; George and Solimine 2001; Clark and Lauderdale 2010). The median justice is measured by using the JCS median score for each Court in the years analyzed.

Although the median justice is defensible in terms of determining the ideology of the Supreme Court, there is still the possibility of incorrectly placing the decision-making power for *certiorari* in the hands of a justice that may not be the deciding factor. Although in the analysis below I use the median justice, I employ two other variables. Using the order of the JCS scores for the justices in a given year, I create one variable for the fourth justice (one score below the median) and one variable for the sixth justice (one score above the median). Although I posit that the justice immediately below the median is most likely to be the fourth justice in cases, I need to account for the possibility that the more ideologically conservative sixth justice is the deciding vote needed for *certiorari*—and that litigants may use the ideological position of the sixth justice as a signal for appealing.[20]

I also control for several other important factors for the decisions to appeal. As previously mentioned, most circuit panel decisions are unanimous, causing dissents to hypothetically serve as signals to both the litigating parties and the Supreme Court that there is a lack of cohesion regarding the application of law or precedent in a case. This signal theoretically leads to an increased likelihood of appeal and review, particularly if there is an upsurge in dissent over time. In the original dataset, dissent is coded as a dummy variable, with a value of "1" indicating that there was a published dissent in the case. In the final analysis, the value of dissent is the average rate of published dissents in a circuit in a given year, with higher values indicating more dissents in that circuit.

In addition to the dissent rate, I also include a variable for the average rate at which the circuit court reversed the lower courts. Because most cases heard by the circuit courts during this time period were affirmed in whole or in part (72.04%), an increase in reversals over time could signal to the Supreme Court that there is conflict over the appropriate disposition of cases within circuits—consequently increasing the likelihood that the Supreme Court will pay closer attention to petitions from that circuit (Cameron, Segal, and Songer 2000; Clark and Kastellec 2013).[21] The closer attention paid by the Court at the macro level reduces the cost of appeals because strategic litigants can use higher rates of disagreement between circuits and districts as a way of getting the Court's initial attention (Table 4).

[20] I use the term "conservative" because an examination of the data indicates that in the years analyzed the sixth justice always has a positive JCS score.

[21] Although not measurable at the macro level, higher rates of disagreement between the district and circuit courts may indicate that there are fewer litigants who have lost in both lower courts—making petitions more attractive because litigants can provide an additional sign that they possess a "better" case for the Court to review.

Data analysis

There was a total of 312 observations for the time period analyzed (27 years, 12 circuits per year, minus 12 degrees of freedom). The χ^2 of 78.35 is significant at the .001 level, indicating that the variables are independent of one another. The pre-estimation unit root analysis in Appendix A indicates that the variables are stationary, meaning that the statistical properties of the variables (mean, variance, etc.) will return to the equilibrium if disturbed—avoiding modeling issues of a change in the properties of the variables should there be a "shock." The dependent variable, lagged appeals to the Supreme Court, is significant at the .05 level and positive, indicating that appeals to the Supreme Court are significantly increasing from year to year. Given the evidence that grants of *certiorari* declined between 1983 and 2009, this result is interesting: if litigants were strategic, would appeal not decline as grants of review decline? To answer this question, we must examine the regression analysis.

Of the two ideology variables, only the lagged distance between circuit and Supreme Court medians is significant; greater differences between the mean direction of circuit decisions and the circuit panel medians do not significantly affect appeals to the Supreme Court. This lack of significance is disappointing and contrary to the literature: if the circuits are behaving in a manner different from what is predicted by the median, then why are litigants not responding in the predicted manner? A plausible explanation for this finding lies in the fact that the mean directions of the decisions of the circuits during this time are more conservative than the median judge's position would predict. If the policy preferences of the Supreme Court are generally conservative, based on the median justice (and the Court is conservative, with the exception of 2005), then the Court may be more concerned with the policy preferences of the median judges on circuit panels, rather than the overall ideological direction of the circuits' decisions, since the judges may be more liberal but the decisions are in a direction favored by the Court. In summation, litigants do not concern themselves with the forest of the ideological directions of all decisions, only on whether a litigant's particular case runs in a manner contrary to the preferences of the Court. The disconcerting conclusion of this logic is that longitudinal analysis of the circuit courts–Supreme Court relationship is inappropriate—undermining the research herein. However, the result for ideological distance allays this fear, as litigants do care whether the panel medians are further away from the preferences of the Supreme Court median in the aggregate: as the ideological distance between the median panel judges and the median justices increases, appeals to the Supreme Court increase. The result for the circuit ideology, then, can be construed as a faulty measurement for pooled aggregate analysis, rather than an indictment of the use of pooled time series analysis for ideological preferences.

My hypothesis regarding the resource gap among litigants is supported: as the size of the resource gap among litigants increases, appeals to the Supreme Court decrease. This finding lends credence to the theory that litigants are strategic and calculate the risks and benefits of appealing to the Supreme Court. For less advantaged litigants, it is likely they do not have the capabilities to appeal an adverse appellate court decision because the Supreme Court reviews so few cases and because previous decisions by the Court regarding jurisdiction and litigation have hindered their ability to petition the Court for review. These litigants do not wish to spend the time and money on an appeal that will likely not be heard. Conversely, more advantaged litigants losing in the circuits do not want to risk the Supreme Court accepting their case and then affirming the circuit's decision—creating a precedent binding on the entire country. As a result, more successful litigants will end their appeals to avoid a nationally disadvantageous outcome. Even when the "haves" do win in the appeals courts if there is the possibility that the high court will grant review and overturn the circuit decision, the more advantaged litigants may seek to stymie appeals by settling with the losing side.

Of the control variables, only the treatment of the trial court's decisions was significant, and it was significant only at the .10 level. As the rates of mixed circuit outcomes (affirmed in part,

etc.) and reversals of the trial courts increase, appeals to the Supreme Court (weakly) increase. The logic for a circuit's treatment of trial court decisions is intuitive. Circuits overall affirm the decisions of the original jurisdiction courts. Consequently, an increase in mixed decisions—or reversals of the original jurisdiction courts—serves as a signal to litigants that there is significant conflict between the original jurisdiction and appellate courts, thus increasing the likelihood the Court will pay closer attention to a circuit and making appeals more likely.

Discussion and conclusion

The outcomes of the model raise interesting questions regarding how much we researchers know about the behavior of judicial actors and institutions. In terms of litigant resource, the findings of this study lend credence to the theory of litigants as strategic actors, as larger resource gaps between litigants decrease appeals to the Supreme Court over time. This finding is not surprising, and it confirms what the extant literature has previously found: if one side is more advantaged than the other, then they can make better calculations regarding the likelihood of a successful appeal—and consequently decide to either not appeal or settle with their opponent, given the low likelihood of a grant of *certiorari* (or the likelihood of a grant of *certiorari* coupled with the reversal of the lower court decision). An additional inference is that more advantaged litigants losing in the lower court believe that they have little chance of obtaining victory before the Supreme Court and consequently abandon the judicial "game."[22] The implication of this finding is that as the resource gap between the "haves" and "have nots" increases over time, the federal circuit courts will be more likely to become the final arbiter of legal disputes.

What is left unresolved in this research are the specific calculations for determining whether the pursuit of *certiorari* is worthwhile, with regard to the ideologies of the courts. It can be inferred that strategic litigants calculate the ideological distance between the circuit court and the Supreme Court, and more advantaged litigants are likely to more accurately determine the preference gulf between these courts and adjust appeals strategies accordingly. What we still do not know is whether (in the aggregate) litigants consider deviations from expected circuit behavior in their decisions to appeal.[23] Although the insignificance of the distance between the median panel judges' ideological preferences and the mean directions of the circuits' decisions suggests that litigants do not consider this difference as an important signal for appeals, this study cannot determine whether this lack of finding is the product of a suboptimal conceptualization or an actual lack of empirical support. Future research must resolve this quandary.

One unanswered question from this study is whether appeals to the Supreme Court decline because more advantaged litigants decide to settle or because less advantaged litigants refuse to appeal.[24] Even if the quality of cases appealed to the high court are increasing, this possibility

[22]Still another possibility is that more advantaged winners in the lower court will refuse to settle and allow the less advantaged losers to appeal, in the hope that the Court will grant review and uphold the lower court decision, transforming a regional precedent into a national one, but an investigation of this account must wait for future research.

[23]This is part of a bigger issue of determining, at the macro level, how strategic litigants really are and how great a risk there is of committing an ecological fallacy in making micro-level inferences from the macro-level trends. There are over 300,000 cases in the Court of Appeals database—with over 300,000 losing litigants—but only 8,000 of these unsuccessful litigants appeal to the high court. Although the factors analyzed in this research suggest that litigants are strategic, the downside to analysis at the macro level is that it is more difficult to determine which specific litigants are acting strategically, which are accepting the long odds of review by the Court, and which are (for lack of a better term) "Hail Mary" appeals and are not strategic. In other words, even though the results of the study show strategy among litigants at the aggregate level, these conclusions cannot infer that there is always strategic litigating at the individual case level. Future research should take the lessons learned at the macro level and test their applicability at the micro level.

[24]In addition, and as an additional comment on future research on resource advantage in general, it may be prudent to examine whether these relationships are affected by race or gender, particularly regarding discrimination cases, as women in general (Karpowitz et al. 2012) and African American women in particular (Acker 2006) traditionally suffer greater resource disadvantages in American democracy. Such studies, however, require more information regarding litigant demographics, reporting lacking in court documents outside of racial and gender discrimination cases.

may not preclude the idea that there are many other qualified lower court decisions not appealed to the Supreme Court.[25] If lower court litigants are truly rational actors, then they can and do compute the costs and benefits of an appeal, and as discussed in the previous sections more advantaged litigants should settle following a lower court victory if they believe their opponent has a good chance at success on appeal to the high court. Alternately, those litigating parties losing in the lower court may refuse to appeal because they believe their likelihood of success is low. Further study is needed to determine whether lower court losers or winners are driving changes in *certiorari* petitions.[26]

Also left unanswered is whether petitions for *certiorari* increase because litigating parties believe the Court is concerned with the ideological preferences of the panels themselves, or if appeals increase because the panel medians reflect the median of the entire circuit. In other words, does the Court (litigants believe) view median panel judges as reflecting the preferences of the circuit as a whole? There is the alternate possibility that a greater ideological distance between panel median judges in the aggregate and the median judge for the entire circuit may serve as a cue for review, as litigants could use such a divide to signal the Court that there are two conflicting medians, with conflicting preferences, on the circuit. If the distance is too great, then the Court could use higher rates of review as an attempt to get the circuit judges to become more in sync with one another (presumably in a policy direction amenable to the Court) in order to avoid higher audits in the future.[27]

There is also the possibility that using panel median preferences as the measure for circuit ideology is erroneous. The lack of significance in terms of ideological distances' effects on Supreme Court review raises the possibility that the Court does not view ideological disagreement between itself and the median panel judges as an important cue for the Court's *certiorari* decisions. This finding does not preclude the theory that the Supreme Court does not examine the median ideology of the circuit, however, as there is the likelihood that the Court views the median judge for the entire circuit as the policy point to observe, in determining whether the policy preferences of a circuit are changing. Such an outcome would support Scott's (2006b) contention that the ideologies of the median judges on a panel do not matter as much to the Supreme Court and that the Court examines the median judge for the entire circuit, as the circuit median may inform the Court more regarding whether the panel decision reflects the ideology of the circuit itself (a macro level cue) or simply a dissonant panel (a micro-level cue). The implication is that litigants in the aggregate may be attempting to send a signal that the Supreme Court does not consider informative: litigants believe that the ideological distance between the panel and Supreme Court medians serves as a cue for greater auditing, when in reality the Court is more interested in the distance between the circuit and Supreme Court median ideology.

The research conducted herein sheds new light on the nature of appeals to the Supreme Court across time and federal appellate courts. This study is the first of its kind, and the results are decidedly mixed as to which factors—ideological or otherwise—influence the decisions made by litigants, circuit court judges, and Supreme Court justices. Whether these results are the result of the underlying nature of judicial actor decision-making—or the product of suboptimal data or

[25]This concern also flows into the issue of changes in the legal agenda of the federal courts. Because litigants unsuccessful in other branches of American politics will turn to the courts for relief (O'Connor and Epstein 1983), and because litigants seek to draw the attention of the courts to a new controversy or policy issue, changes in the framing of issues and the sociopolitical context of (some) cases may increase *certiorari*—and provide strategic litigants with an additional signal for the Court (at least at the micro level).

[26]A related concern is whether the likelihood of reversal affects appeals to the Supreme Court and grants of *certiorari* in favor of one set of litigants (i.e., upper dogs), since the Supreme Court theoretically grants petitions with an eye to reversing the lower court.

[27]With expanded sampling and more recent data, this account would also allow me to control for changes in *en banc* decisions, since the Supreme Court is more likely to review individual cases that are decided by the entire circuit court (George and Solimine 2001; Scott 2006a; Lindquist et al. 2007).

analysis—remains to be seen, but the temporal, cross-sectional nature of appeals cannot—and should not—be ignored. As long as the judiciary remains an institution with no self-starting mechanism—and with a partisan divide mirroring the general partisan divide in government and American society—the temporal, cross-circuit behavior of germane actors is of great importance, and the results of this research indicate that there is still much to be learned regarding the choices made by some of the most powerful groups in American government, particularly the signals sent by these actors over time. These new research questions, however, are part of the adventure of empirical research: more research can lead to better answers, which in turn leads to better solutions to the policy problems facing America.

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Appendix A. Im-Pearson-Shin test for unit root, trend

H_0: All panels contain unit roots
H_a: Panels stationary
Number of Panels: 12
Number of Time Periods: 27

	Coefficient	PCSE	Prob > |z|
Appeals to the Supreme Court (lagged)	0.1511763	0.0714817	0.034**
Distance between Circuit and SC Median (lagged)	0.0915894	0.0364604	0.012**
Circuit Ideology (lagged)	−0.0337665	0.0276545	0.222
Mean Resource Gap (lagged)	−0.0046929	0.0024073	0.051*
Mean Dissent Rate (lagged)	0.0565296	0.0771003	0.463
Mean Treatment of Lower Court Decision by Circuit (lagged)	0.0475126	0.0267562	0.076*
Criminal Case Rate	−0.0685092	0.1146471	0.550
Civil Rights/Liberties Case Rate	−0.0300584	0.1123877	0.789
Labor/Economic Case Rate	−0.0865686	0.1037935	0.404
Median Supreme Court Justice	−0.1263064	0.0808	0.118
4th Justice	−0.0185481	0.027137	0.494
6th Justice	0.0286543	0.0470671	0.543

*$p \geq .10$.
**$p \geq .05$.

Grants of Certiorari *by the Supreme Court*

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−5.0322		−2.680	−2.530	−2.450
t-tilde-bar	−3.5013				
Z-t-tilde-bar	−9.1552	0.0000			

Distance between Mean Panel Median Judge Ideology and Supreme Court Median Justice Ideology
Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−4.2092		−2.680	−2.530	−2.450
t-tilde-bar	−3.2579				
Z-t-tilde-bar	−8.0794	0.0000			

Circuit Ideology
Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−5.2444		−2.680	−2.530	−2.450
t-tilde-bar	−3.6297				
Z-t-tilde-bar	−9.7225	0.0000			

Mean Resource Gap between Litigants
Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−5.5795		−2.680	−2.530	−2.450
t-tilde-bar	−3.7371				
Z-t-tilde-bar	−10.1970	0.0000			

Mean Rate of Dissent
Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−5.3733		−2.680	−2.530	−2.450
t-tilde-bar	−3.6611				
Z-t-tilde-bar	−9.8612	0.0000			

Mean Treatment of Lower Court Decision by Circuit Court
Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−5.6987		−2.680	−2.530	−2.450
t-tilde-bar	−3.7606				
Z-t-tilde-bar	−10.3009	0.0000			

Mean Criminal Case Decisions Rate

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−4.8019		−2.680	−2.530	−2.450
t-tilde-bar	−3.5126				
Z-t-tilde-bar	−9.2050	0.0000			

Mean Civil Rights/Liberties Decisions Rate

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−5.0247		−2.680	−2.530	−2.450
t-tilde-bar	−3.5533				
Z-t-tilde-bar	−9.3847	0.0000			

Mean Labor/Economic Decisions Rate

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−4.8026		−2.680	−2.530	−2.450
t-tilde-bar	−3.4638				
Z-t-tilde-bar	−8.9894	0.0000			

Supreme Court Median Justice

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−3.0215		−2.680	−2.530	−2.450
t-tilde-bar	−2.6601				
Z-t-tilde-bar	−5.4381	0.0000			

4th Supreme Court Justice

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−2.2247		−2.680	−2.530	−2.450
t-tilde-bar	−2.1036				
Z-t-tilde-bar	−2.9789	0.0014			

6th Supreme Court Justice

Fixed-*N* Exact Critical Values

	Statistic	*p*-value	1%	5%	10%
t-bar	−1.9903		−2.680	−2.530	−2.450
t-tilde-bar	−1.9039				
Z-t-tilde-bar	−2.0966	0.0180			