Measuring Judicial Ideology Using Law Clerk Hiring

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We present a new measure of judicial ideology based on judicial hiring behavior. Specifically, we utilize the ideology of the law clerks hired by federal judges to estimate the ideology of the judges themselves. These Clerk-Based Ideology (CBI) scores complement existing measures of judicial ideology in several ways. First, CBI scores can be estimated for judges across the federal judicial hierarchy. Second, CBI scores can capture temporal changes in ideology. Third, CBI scores avoid case selection and strategic behavior concerns that plague existing vote-based measures. We illustrate the promise of CBI scores through a number of applications. (*JEL*: M51)

1. Introduction

The political ideology of judges plays a significant role in understanding judicial decision-making and judicial politics. Judicial ideology has

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been found to be highly influential for judicial decision-making (Segal and Spaeth, 2002; Sunstein et al., 2007; Epstein et al., 2013) and is thought to outweigh many other factors—including legal ones—in terms of its ability to predict judicial outcomes (Martin et al., 2004; Ruger et al., 2004). In addition, judicial ideology represents a mechanism through which to understand the strategic factors shaping the interactions between judges and justices (e.g., Epstein and Knight, 1998), between the judiciary and the other branches of government (e.g., Cameron et al., 2000), and even between the political parties, the bar, and the judiciary (e.g., Bonica and Sen, 2015). Increasingly, judicial ideology has begun to play an important role in how the public understands and evaluates rulings and controversies involving U.S. Supreme Court Justices and lower court judges (e.g., Liptak, 2015).

Uniting all of these inquiries is the need for accurate estimates of the ideology for judges across the judicial hierarchy. Despite this importance, however, the literature has been unable to provide a dynamic measure of ideology that can be estimated across tiers of the federal judiciary. In this article, we offer one such measure. Specifically, we leverage the agency relationship between judges and their law clerks. The motivation in developing the Clerk-Based Ideology (CBI) scores stems from a long-standing belief in legal circles that judges tend to hire like-minded law clerks, not just in terms of intellect and personality but also in terms of ideology and politics. For example, Justice Clarence Thomas once declared that hiring clerks was like "selecting mates in a foxhole" (quoted in Liptak, 2010) and that he simply "won't hire clerks who have profound disagreements with me" (quoted in Cushman and Peppers, 2015). Another prominent jurist, Judge Michael Luttig, noted that "it should come as no surprise to learn that the more liberal judges tend both to hire clerks who would self-describe themselves as Democrats and to hire clerks from other judges who would likewise self-describe themselves as Democrats, and vice versa for the more conservative judges" (quoted in Liptak, 2010). In line with these philosophies, CBI scores exploit the fact that who judges hire as clerks may serve as a proxy for the judge's own political and ideological views.

To estimate CBI scores, we extend existing work documenting the political ideology of 7,111 law clerks who have worked on federal district and appellate courts from 1995 to 2004 and 1,220 Supreme Court clerks from

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1960 to 2015 (Bonica, 2014; Bonica and Sen, 2015; Bonica et al., 2016). For each judge in our data, we estimate the average ideological composition of the clerks hired by that judge, rescaled such that all judges are placed on a single, unidimensional scale that corresponds with existing measures of ideology. The end result is a set of CBI scores for 775 judges from across U.S. district courts, circuit courts, and the Supreme Court.

We compare the CBI scores to three other approaches for measuring judicial ideology: (1) by comparing them to a measure of judicial ideology based on the judge's own political donations (Bonica and Sen, 2016), (2) by assessing their power in predicting Supreme Court votes, and (3) by comparing them to existing measures of judicial ideology, including the Judicial Common Space (JCS) scores (Epstein et al., 2007) and, for the Supreme Court, Martin–Quinn (MQ) scores (Martin and Quinn, 2002), Bailey scores (Bailey, 2007), and Segal–Cover (SC) scores (Segal and Cover, 1989).

CBI scores improve on existing measures of judicial ideology in three ways. First, CBI scores are available for the vast majority of the federal bench, including lower court judges. That is, although not all judges make political donations themselves (which prevents the construction of ideology for many judges, as in Bonica and Sen, 2016) or hear cases on overlapping panels (which is required for item repose theory (IRT) models, which use similarities in voting patterns to estimate ideology, as in Martin and Quinn, 2002). the vast majority of federal judges hire multiple law clerks each year, and these clerks often make donations.[1] Second, CBI scores leverage the fact that federal judges generally hire new law clerks each year, which enables us to estimate judicial ideology *dynamically*. Thus, unlike most existing measures of lower court judge ideology, which estimate ideology statically at the time of appointment (Giles et al., 2001; Epstein et al., 2007; Bonica and Sen, 2016), CBI scores capture within-judge changes in ideology over time. Third, CBI scores have the advantage of relying entirely on revealed

1. Along these lines, the more years a judge is on the bench, the more reliable our measure becomes, as each newly hired clerk offers a potentially new data point. In contrast, most existing measures of ideology, like JCS scores, do not grow in reliability because they turn on information that is fixed at the time of a judge's investiture. The flip side to this coin is that a judge's CBI score may be quite noisy in the first few years of a judge's appointment. Relatedly, CBI scores for a particular judge may be unavailable in the first few years following a judge's appointment, as recent clerks may not make political donations for several years after the clerkship concludes.

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preferences about clerk hiring—which in turn lessens the concern that they are driven by case selection, strategy, coalition building, or bargaining. This contrasts with several votes-based measures of judicial ideology (e.g., Martin and Quinn, 2002; Windett et al., 2015). To sum, CBI scores are, to our knowledge, among the first to allow time-varying estimates of the ideology of all judges outside the Supreme Court—a possibility that opens up a variety of questions for future research to explore.

To illustrate the potential of the CBI scores, we provide several applications of their use. First, we take advantage of the fact that CBI scores are available for lower court judges to examine the geographic distribution of ideologies among district courts and circuit courts. Second, we exploit the dynamic nature of CBI scores to study changes over time in the ideology of individual Supreme Court Justices. Finally, we show how CBI scores permit comparison of judges at different levels of courts by studying how a potential nominee to the Supreme Court would affect the Court's ideological balance.

This article proceeds as follows. Section 2 situates our contribution within the context of previous measures of judicial ideology. Section 3 provides additional motivation for why clerk ideologies are a useful proxy for judicial ideology. Section 4 describes the construction of the scores and provides some summary statistics. Section 5 compares CBI scores to existing measures of judicial ideology. Section 6 provides three illustrative applications. Section 7 discusses selection concerns and provides a robustness check by imputing clerk ideology using a machine learning procedure. Section 8 concludes by discussing how CBI scores may be used in future research.

2. Existing Measures of Federal Judge Ideology

The estimation of judicial ideology has become an important part of the study of judicial politics. A number of studies have documented the important role that ideology plays very generally in terms of predicting judicial decision-making (e.g., Ruger et al., 2004; Katz et al., 2014). However, the importance of ideology in understanding judicial behavior

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extends well beyond its role in decision-making. For example, looking at the Supreme Court, a number of papers have relied on measures of judicial ideology in analyzing the identity and ideological location of the Supreme Court's median Justice (Martin et al., 2005), how the Justices bargain among themselves on the content of opinions (Carrubba et al., 2012), and the how Justices may intellectually "drift" over time (Epstein et al., 2007). These inquiries extend to separation-of-powers games involving the Supreme Court and Congress (Owens, 2010), how the President might approach nominations as a move-the-median stratagem (Krehbiel, 2007), and how the Supreme Court monitors lower court decisions (Cameron et al. 2000).

Given this scholarly interest, a fairly extensive literature has developed exploring how to best estimate the ideology of judges across tiers of the federal judiciary. [See Fischman and Law, 2009 for an excellent overview.] For the U.S. Supreme Court, the fact that the nine Justices sit together makes it possible to leverage votes on cases to generate dynamic ideological estimates. For example, Martin and Quinn (2007) use Bayesian IRT estimation to generate measures (known as MQ scores) of Supreme Court Justice ideology that have become widely used in both law and political science. Other extensions have generated estimates of Supreme Court Justice ideology that vary according to issue area (Clark and Lauderdale, 2010) or rely in part on opinion texts (Lauderdale and Clark, 2014). Bailey (2007) also relies on Bayesian IRT estimation and, by using Supreme Court decisions reviewing Congressional actions as bridging observations, provides estimates of Justice ideology that are on the same scale as measures for Congressional representatives and presidents. Stepping back from votes-based approaches, Segal and Cover (1989) develop scores (known as SC scores) for Supreme Court Justices that rely on newspaper editorials dating from before the Justices were appointed.

Although ideological estimates for Supreme Court Justices are both well established and widely used, existing measures raise a number of concerns. [See Fischman and Law (2009) and Bailey (2016) for overviews.] For example, MQ scores rely on case coding, specifically coding each vote on a liberal–conservative dimension, which can prove problematic when it comes to complicated, multi-issue cases or for cases that have no clear

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ideological dimension.[2] Another potential problem is that votes-based measures rely on merit votes, which mean that the Court has already agreed to hear the case. The fact that ideology influences whether Justices agree to hear cases introduces endogeneity concerns and may make it difficult to compare the scores across different terms (Epstein and Knight, 1998; Bailey, 2016). Some measures that do not rely on votes resolve these problems, but introduce problems of their own. For example, SC scores exploit newspaper coverage of the Justices from their pre-nominations days (Segal and Cover, 1989), but, as noted by Epstein and Mershon (1996), rely both on subjective student coders (and their ability to discern fairly nuanced liberal and conservative evaluations) and also newspaper coverage itself, which may be endogenous to the ideological leanings of newspaper editors. In addition, SC scores, by virtue of being estimated from pre-investiture writings, do not vary over the course of a Justice's career on the bench, which makes it difficult to assess time trends, including the possibility of intellectual drift (Epstein et al., 2007).

Ideological measures for judges sitting on federal lower courts suffer from additional problems.[3] For example, bridging votes on cases to estimate votes-based measures (such as MQ scores) is difficult because lower court judges—including U.S. district court judges or circuit court judges—rarely sit together outside of their home jurisdictions. In turn, this makes it challenging to generate ideological estimates that are comparable across different courts.[4]

Given these problems, scholars have developed alternative methods for estimating the ideology of lower court judges that do not rely on the coding

2. An example of a case with no clear ideological dimension, cited by Bailey (2016), is *Gonzales v. Raich* (2005), a case about the federal government's power under the Commerce Clause to supersede state drug laws.

3. We limit our inquiry and our discussion of the literature to attempts at estimating *federal* judge ideology, including that of lower court judges. However, we note that progress has been made in attempts to estimate the ideologies of state court judges. Some notable examples include Windett et al. (2015), who use a Bayesian IRT approach in tandem with data from Bonica (2014); Brace et al. (2000), who use the ideological scores of key nominating actors; and Bonica and Woodruff (2015), who present scores that rely on DIME that we also use here.

4. Judges from different circuits or districts occasionally "visit" other circuits or districts, but not all judges visit and the instances of visiting may be too few to use as effective "bridges."

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of votes. Perhaps the best known are JCS Scores (Giles et al., 2001; Epstein et al., 2007; Boyd, 2015), which leverage the identity of the appointing political actors to produce estimates of the ideology of a judge. Specifically, JCS scores rely on well-established ideological measures (nominate scores from Poole and Rosenthal (2000); Poole (1998)) of either the judge's appointing President or, in the event that the President and the home state Senator(s) are of the same party, that of the senior co-partisan Senator (or an average of both Senators, if both are of the same party). Similarly, Yung (2010) develops a measure of circuit court judge ideology based on how frequently the judge votes with Democrat versus Republican appointees during a given term. More recently, Bonica and Sen (2016) use the CFscores we leverage here to generate estimates for federal district and circuit court judges, which are based on the judge's own political donations.

Although the JCS scores and the CFscores are useful measures of lower court judge ideology, they are both estimated at time of investiture and are, therefore, static measures of ideology (as are SC scores). JCS scores are constant over time because they are calculated based on the ideology of the politicians that appointed the judge,[5] and judge's CFscores are constant over time because federal judges are prohibited from making political donations.[6] At least in the context of the Supreme Court, Martin and Quinn (2002) have shown ideological movement over a judge's tenure, including systematic intellectual drift (Epstein et al., 2007). Lower court judges, although perhaps more constrained in their decision-making, may also exhibit temporal movements in ideology. This limits the applicability of the static measures.

3. Using Law Clerks to Measure Judicial Ideology

CBI scores of judicial ideology rely on the assumption that judges tend to hire clerks with ideologies similar to their own. Several factors support this assumption. First, a judge may wish to hire clerks with similar ideologies because such clerks are more likely to reach the same outcome when

5. JCS scores can change if a judge is "promoted" during his or her career (e.g., from a district court to a circuit court).

6. Code of Conduct for U.S. Judges, Canon 5.

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considering how a case should be decided (Liptak, 2010; Baum, 2014). The judge's preference here may be instrumental (i.e., believing it would be a waste of time to hire clerks who disagree[7]) or psychological in the sense that people are drawn to those who share their beliefs (McPherson et al., 2001).[8]

Second, a judge may prefer to hire clerks who share his or her ideology because of the difficulty in monitoring the clerk's work. That is, a clerk who is ideologically predisposed to reach a particular result in a case may intentionally or unintentionally present the judge with research that is biased toward supporting the clerk's favored outcome. The larger the ideological divergence between the judge and the clerk, the more time and energy the judge must spend monitoring the clerk's work. To reduce monitoring efforts, the judge may be motivated to hire clerks who are in ideological alignment with them (Ditslear and Baum, 2001).

Finally, some judges may wish to hire ideologically aligned clerks because the judge knows that the clerkship will further the clerk's career, and the judge might prefer to support the career of an ideological ally (Baum, 2014). For example, Judge Alex Kozinski, a prominent conservative on the ninth Circuit Court of Appeals, has been open about his desire to hire and train conservative and libertarian lawyers (Kozinki and Bernstein, 1998).[9] Moreover, even a judge who attempts to avoid taking ideology into account may do so subconsciously. After all, judges have been shown to be subject to many of the same biases as other decision-makers (e.g., Guthrie et al., 2001; Wistrich et al., 2005).

7. For example, Justice Clarence Thomas has commented that hiring a clerk with a different ideological outlook is "like trying to train a pig. It wastes your time, and it aggravates the pig" (Liptak, 2010).

8. Of course, other judges may be drawn for instrumental or psychological reasons toward the opposite behavior, that is, hiring clerks with whom they are likely to disagree. Justice Antonin Scalia is an exemplar here, but even so, three out of four of Scalia's clerks were not "counter-clerks." The result of hiring of such counter-clerks is that a judge will appear as less extreme using our measures than her or she actually is.

9. To be sure, many judges have explicitly disclaimed any consideration of ideology in their hiring process (Liptak, 2010). To the extent that certain judges are more ideological in their hiring than others, our measure will provide a better proxy for the former group than the latter. In addition, judges may not be entirely candid in their public descriptions of how they make decisions (Posner, 2010).

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Apart from the reasons a judge may wish to hire clerks with whom they will agree politically, clerks themselves may prefer and seek out judges whose ideology matches their own (Baum, 2014), which represents a type of two-sided matching (Roth and Sotomayor, 1992). That is, judges are likely to consider ideology in hiring clerks for the reasons discussed above, and, in addition, law clerk applicants themselves may seek out judges with whom they are in ideological alignment. This could be because clerkship applicants believe that working for an ideologically aligned judge will provide a better opportunity to further their own ideological goals, or it could be because they expect that the clerkship experience will be more satisfying if they agree with the judicial opinions that they are helping to write.

Finally, even if a clerk who begins working for a judge does not share that judge's ideology, it is possible that the clerkship experience itself will cause the clerk's ideology to evolve toward that of the judge. That is, the clerk may be influenced by the judge and end up with an ideology that is closer to that of the judge's as compared to when the clerkship began.[10] As long as clerks tend to evolve ideologically in the direction of the judge (as opposed to in the opposite direction), this dynamic will also promote the ideological alignment between clerks and judges upon which the CBI scores rely.

Although it is likely that neither judges nor clerks would explicitly ask the other about their ideology during the hiring process, sufficient information generally exists to make educated guesses along this dimension. For example, judges may rely on the applicant's activities during law school (such as whether the applicant was active in the conservative Federalist Society or the liberal American Constitutional Society), the recommendations of law professors, writing samples provided by the applicant, or prior judges for whom the applicant has clerked. Clerkship applicants are also likely to have information about judges' ideologies based on prior judicial opinions and reputations among practitioners.

10. This influence may operate through multiple channels. For example, the judge may convince the clerk of the rightness of the judge's position. Alternatively, the clerk may come to embrace the judge's position because of cognitive dissonance—after all, the job of many clerks is to hone arguments supporting the judge's position.

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There is ample empirical evidence for these positions. For example, looking at the Supreme Court, Ditslear and Baum (2001) and Baum (2014) find a strong relationship between clerk ideology and the ideology of the judges for whom they clerk. As one possible pathway for this connection, Baum and Ditslear (2010) find that the identity of the judge the clerk previously worked for provides an important signal to the Justice regarding the clerk's possible ideological orientation. This is consistent with Peppers (2006), who finds in his survey of former Supreme Court clerks a rough correspondence between the partisanship of the hiring Justices and the partisanship of his or her clerks (Peppers, 2006, pp. 34–6). Most recently, Bonica et al. (2016) draws on the same data we describe below and documents a positive relationship between the ideology of judges and the ideology of their clerks across all tiers of the federal judiciary.

4. Construction of the CBI Scores

We now turn to developing our CBI scores. In this section, we first discuss the data used in constructing the scores and how the CBI scores are calculated, and then present some basic summary statistics. We compare CBI scores to other measures of judicial ideology in the next section.

4.1. Data Used to Construct CBI Scores

Our approach relies on the availability of political ideology data for judicial law clerks. The data we use come from two sources: (1) data on political ideology, which come from the Database on Ideology, Money, and Elections (DIME) (Bonica, 2014), and (2) data on the identities of federal law clerks. We review both briefly; additional information on both datasets, including details on how we linked between the two sources of data, can be found in Bonica et al. (2016).

4.1.1. *Ideology score data from the DIME.* DIME leverages political donations made between 1979 and 2014 that are publicly disclosed under federal law to the Federal Elections Committee to construct ideology scores, called CFscores, for 13.4 million individuals who have donated. The CFscores are scaled on a unidimensional ideological scale from liberal to

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conservative.[11] On an intuitive level, the operationalization relies on the fact that individuals tend to support those candidates with whom they are ideologically aligned. Thus, someone who is more conservative will be more likely to make political donations to conservative candidates, while the opposite will be true for someone who is more liberal.

4.1.2. *Data on federal law clerks.* Our sample of federal law clerks comes from two sources. The first was compiled by Katz and Stafford (2010) and provides the names of those who clerked on district and circuit courts from 1995 to 2004. These data include 5,057 circuit court clerks and 12,580 district court clerks. The second source is the Supreme Court information office. It provides the names of the 1,854 U.S. Supreme Court clerks from 1960 to 2015. As described in Bonica et al. (2016), we matched the CFscores from DIME to the data on law clerks. We also recovered CFscores for federal judges who served at any point between 1995 and 2004.

One potential concern is that clerks who donate (and are, therefore, represented in DIME) differ in important ways from clerks who do not donate (and are, therefore, missing in DIME). In Section 7, we discuss how the availability of ideology scores only for those who donate might affect CBI scores, but, as a first pass we present some data on who donates. Specifically, Table 1 presents the proportion of clerks who donate and are, therefore, represented in DIME. As the table shows, with an overall rate of 42.7%, law clerks tend to be a highly engaged, politically active group—much more likely to donate than are Americans in general. (The donation rate in the general population is approximately 5%). In addition, this fraction increases with the political importance of the court, with circuit court and Supreme Court clerks more likely to be present in the data.

Another potential concern with using political donations to measure ideology is that they could be the subject of strategic donations—specifically if

11. For example, Hilary Clinton and Barack Obama have CFscores that put them toward the liberal end of the spectrum, with CFscores of −1.16 and −1.65, respectively. By contrast, Ron Paul and John Boehner have CFscores that put them on the more conservative end of the spectrum, with CFscores of 1.57 and 0.95, respectively. Additional summary statistics on the ideological leanings of various political actors and of the bar as a whole can be found in Bonica et al. (2015) and with regards to law clerks specifically in Bonica et al. (2016).

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Table 1. Proportion of Law Clerks Matched to Donations

	Political party of appointing President		
Court	Democrat	Republican	All
District court	38.6	37.2	37.8
Appeals court	47.0	46.1	46.5
Supreme court	63.6	66.7	65.8
Total	42.2	43.2	42.7

individuals donate to certain candidates to further their careers or financial or professional interests. This is a topic extensively discussed in Bonica (2014), Bonica and Sen (2016), and Bonica et al. (2015), all of which find no evidence of systematic strategic behavior.

4.2. Construction of the CBI Scores

The CBI score for a judge is constructed from the mean of the CFscores of the clerks employed by that judge. That is, the CBI score for judge j, CBI_j, is given by

$$\text{CBI}_j = \frac{1}{N_j} \sum_{i=1}^{N_j} \text{CFscore}_{ij}$$

where CFscore_{ij} denotes the CFscore of clerk i who worked for judge j and N_j denotes the number of clerks in our sample who worked for judge j.[12]

Bonica et al. (2016) showed that clerks tend to be more liberal than the population. However, differences between judge's average CFscore of clerks will nonetheless correspond to meaningful differences in ideology. We therefore normalize the CBI score by subtracting the mean CBI score (-0.62) and dividing through by the standard deviation ($\text{SD} = 0.57$). The normalized CBI score has a mean of 0 and a CBI score of 1 indicates a judge being one standard deviation more conservative than the mean judge.

12. To reduce the noisiness of the measure, we compute CBI_j only for judges for whom $N_j \geq 4$. Judges with $N_j \leq 4$ tend to be those who served only a few years during our sample.

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We herein refer to the normalized CBI score as the CBI score. Using this approach, we compute the CBI score for each federal judge at the district, appellate, and Supreme Court levels.

Along with the CBI score itself, we report for each judge the standard error associated with that score. Because the CBI score is a simple mean, the standard error associated with the score, σ_j, is simply $\sigma_j = \frac{\text{SD}_j}{\sqrt{N_j}}$ where SD_j denotes the SD of the CFscores of the clerks hired by judge j.

The standard error associated with a judge's CBI score reflects the degree of confidence of the reported CBI score. The more accurately the CBI score reflects the average ideologies of the clerks hired by that judge, the lower σ_j will be. To illustrate, suppose that a judge consistently hires only clerks with a very specific ideology; the ideologies of the clerks hired by that judge will have a low standard deviation, implying a low value of σ_j. Conversely, a judge that paid no attention to clerk ideology in hiring and for whom clerks sought to work regardless of their own ideology would have a large value of SD_j, and hence, a large value of σ_j. Finally, the more clerks a judge has hired (and the more those clerks have donated), the smaller the standard error associated with that judge's CBI score.

4.3. Basic Features of the CBI Scores

To illustrate the CBI scores, Table 2 presents the names of the fifteen federal circuit court judges with the most liberal and the most conservative CBI scores. All but one of the fifteen judges with the most conservative CBI scores are Republican-appointed judges. On this list are prominent conservatives, including former judges J. Michael Luttig of the Fourth Circuit and Samuel Alito of the Third Circuit.

However, the list of the fifteen judges with the most liberal CBI score is more surprising and, indeed, includes three Republican-appointed judges. Both David Thompson of the Ninth Circuit and Edward Becker of the Third Circuit were Ronald Reagan appointees and were known for being strong moderates; Becker in particular enjoyed a reputation for ideological plurality in his chambers and routinely invited his clerks to spar about different cases with him. The rest of the names on the list of judges hiring liberal clerks include known liberals such as Stephen Reinhardt (Ninth Circuit) and Marsha Berzon (Ninth Circuit). Of the fifteen judges, nine are from the

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Table 2. The Most Liberal and Conservative Circuit Court Judges Based on CBI Scores

Rank	Judge Name	Circuit	Appointing party	CBI score	Standard error
1	Fletcher, William A.	9	D	−1.40	0.11
2	Reinhardt, Stephen R.	9	D	−1.36	0.07
3	Berzon, Marsha S.	9	D	−1.35	0.12
4	Gibbons, Julia Smith.	6	R	−1.29	0.21
5	Browning, James R.	9	D	−1.28	0.07
6	Murphy, Michael R.	10	D	−1.25	0.15
7	Pregerson, Harry.	9	D	−1.23	0.13
8	Becker, Edward R.	3	R	−1.22	0.11
9	Edwards, Harry T.	DC	D	−1.21	0.10
10	Murnaghan, Francis D Jr.	4	D	−1.20	0.14
11	Thompson, David R.	9	R	−1.20	0.16
12	Wardlaw, Kim Mclane.	9	D	−1.20	0.19
13	Graber, Susan P.	9	D	−1.19	0.12
14	Wood, Diane P.	7	D	−1.18	0.14
15	Tallman, Richard C.	9	D	−1.17	0.17
178	Bryson, William C.	FC	D	1.53	0.43
179	Miner, Roger J.	2	R	1.75	0.93
180	Silberman, Laurence Hirsch	DC	R	1.76	0.50
181	Suhrheinrich, Richard F.	6	R	1.84	0.65
182	Jones, Edith H.	5	R	1.88	0.39
183	Siler, Eugene E., Jr.	6	R	1.88	0.72
184	Rich, Giles S.	FC	R	1.91	0.01
185	Nelson, David A.	6	R	2.09	0.89
186	Williams, Karen Johnson	4	R	2.17	0.33
187	Luttig, J. Michael	4	R	2.29	0.30
188	Alito, Samuel A.	3	R	2.35	0.36
189	Smith, D. Brooks	3	R	2.42	0.48
190	Shedd, Dennis W.	4	R	2.45	0.42
191	Edmondson, J. L.	11	R	2.50	0.51
192	Magill, Frank	8	R	2.87	0.88

Ninth Circuit. The scores for every federal district and circuit court judge are available in the Online Supplementary Materials.

As another illustration of the CBI scores, Table 3 presents the CBI scores for the Supreme Court Justices in our sample. The relative ranking of the Justices recovers very familiar patterns. On the most liberal end of the hiring spectrum is Elena Kagan and on the most conservative end is Clarence Thomas, with Justices like Potter Stewart, Hugo Black, and Sandra Day O'Connor falling in the middle. Perhaps the lone surprise of this table is the

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Table 3. CBI Scores for Supreme Court Justices

Rank	Justice name	Appointing party	CBI score	Standard error
1	Kagan, Elena	D	−1.59	0.07
2	Breyer, Stephen	D	−1.00	0.13
3	Sotomayor, Sonia	D	−0.94	0.33
4	Fortas, Abe	D	−0.90	0.06
5	Souter, David	R	−0.81	0.13
6	Ginsburg, Ruth Bader	D	−0.79	0.17
7	Blackmun, Harry A.	R	−0.63	0.13
8	Stevens, John Paul	R	−0.63	0.15
9	Marshall, Thurgood	D	−0.59	0.14
10	Frankfurter, Felix	D	−0.49	0.66
11	Brennan, William J.	R	−0.37	0.13
12	Stewart, Potter	R	−0.19	0.19
13	Harlan, John M.	R	−0.18	0.28
14	O'Connor, Sandra Day	R	−0.16	0.18
15	Douglas, William O.	D	−0.05	0.29
16	White, Byron R.	D	0.00	0.17
17	Powell, Lewis F.	R	0.05	0.22
18	Reed, Stanley	D	0.13	0.48
19	Warren, Earl	R	0.38	0.32
20	Black, Hugo L.	D	0.41	0.34
21	Clark, Tom C.	D	0.42	0.36
22	Goldberg, Arthur J.	D	0.77	0.85
23	Roberts, John	R	0.85	0.49
24	Burger, Warren E.	R	0.85	0.23
25	Kennedy, Anthony	R	1.26	0.22
26	Rehnquist, William	R	1.28	0.20
27	Scalia, Antonin	R	1.67	0.21
28	Alito, Samuel	R	2.36	0.32
29	Thomas, Clarence	R	2.43	0.15

fact that Anthony Kennedy's CBI score of 1.26 is more conservative than Chief Justice John Roberts' CBI score of 0.85.

Finally, Figure 1 explores the relationship between a judge's CBI score and the ideological consistency of the clerks hired by that judge. One would expect that judges who hire clerks without regard to ideology (and for whom clerks seek to work without regard for ideology) would have a high standard deviation of clerk CFscores associated with them. In contrast, judges who hire clerks with similar ideologies would have low standard deviations of clerk CFscores. It seems likely that the clerks hired by the judges in the latter category provide a stronger signal as to the judge's own ideology than

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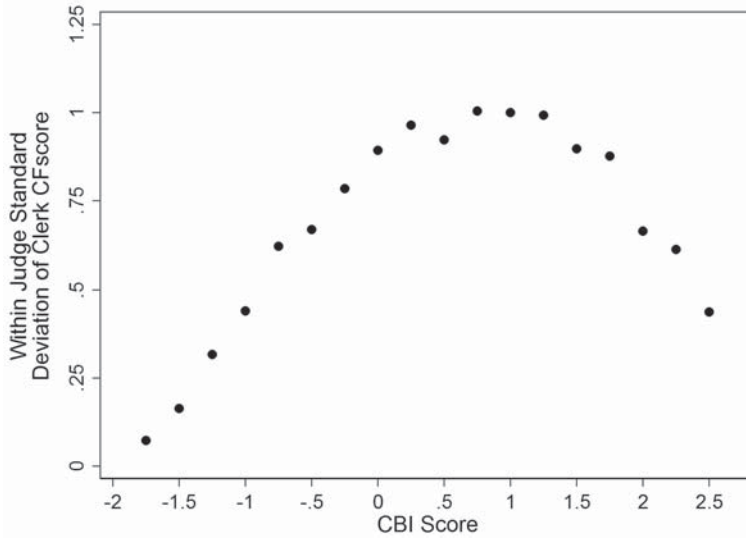


Figure 1. Consistency of Judge Hiring by CBI Score.

the clerks hired by judges in the former category. This is reflected in the standard errors associated with the CBI scores, which, as described above, depend in part on the standard deviation in the CFscores of the clerks hired by a judge.

Figure 1 suggests that judges with more extreme CBI scores—either liberal or conservative—hire clerks that exhibit less ideological diversity than do judges with more moderate CBI scores. There are two plausible explanations for this pattern, both of which may be partially correct. First, it could be that more ideologically extreme judges tend to care more about the ideology of the clerks they hire than do judges that are ideological moderates. Second, this pattern could arise if not all ideologically extreme judges take ideology into account when hiring (or attract clerks on the basis of ideology). In that case, these judges, though actually ideologically extreme themselves, hire clerks from across the ideological spectrum. Such judges would be characterized by moderate CBI scores (reflecting the mean of the clerk ideological spectrum) and relatively large standard deviations in clerk ideology.

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5. Comparison to Other Judicial Ideology Measures

In this section, we compare the CBI scores to other measures of judicial ideology. More specifically, we compare the CBI score to measures based the judge's own political donations, measures of the judge's voting behavior on cases, JCS scores, MQ scores, Bailey scores, and SC scores.

We first compare the CBI score to the judge's CFscore, which measures the judge's ideology based directly on the judge's own political donations. When a judge's CFscore is available, we would generally expect it to serve as a reasonably good proxy for the judge's ideology (Bonica and Sen, 2015). However, as discussed in Section 2, CFscores are not observed for judges who have not made political donations and in any case do not reflect changes in the judge's ideology after the judge is confirmed (and, therefore, prohibited from making new donations). Column 1 of Table 4 presents the results from a regression of judge CFscores on CBI scores. The coefficient on CBI score is positive and statistically significant, consistent with clerk hiring (and thus the CBI score) providing a signal of the judge's ideology.

Next, we consider the relationship between CBI scores and measures of ideology based on judicial voting behavior. For this analysis, we rely on hand-coded data on whether decided cases are liberal or conservative, from the Supreme Court database. Using this approach, the higher the fraction of conservative votes a Justice casts over his or her tenure, the more conservative that Justice's ideology. Column 2 of Table 4 presents the results from a regression of voting behavior, as measured by the proportion of all votes

Table 4. CBI Scores Versus Existing Measures of Ideology

	Judge CFscore (1)	Cons. vote (2)	JCS score (3)	MQ score (4)	Bailey score (5)	SC score (6)
CBI score	0.674***	1.032***	0.631***	1.074***	0.997***	0.961***
	(0.089)	(0.273)	(0.060)	(0.267)	(0.278)	(0.283)
Obs	314	29	756	29	29	29
R^2	0.156	0.345	0.129	0.374	0.323	0.300

Note: Each outcome is normalized to have mean of 0 and standard deviation of 1. ***$P < 0.01$.

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which are conservative, on CBI scores. Again, the coefficient is positive and statistically significant.[13]

The third measure of judicial ideology we compare to CBI scores is the JCS score. As described in Section 2, JCS scores are based on the ideology of the President who appointed the judge and the senators from the judge's home state. Whereas JCS scores infer the judge's ideology from the political actors involved in choosing the judge, CBI scores infer the judge's ideology from those individuals the judge chooses himself or herself. The relationship between CBI and JCS scores is captured in Column 3 of Table 4. Here too, the two scores appear to be strongly positively correlated.

Lastly, we compare the CBI scores to the MQ scores, Bailey scores, and SC scores, each of which are commonly used to measure judicial ideology at the Supreme Court. As described in Section 2, MQ scores and Bailey scores are closely related to measuring of ideology based on judicial voting. Columns 4, 5, and 6 of Table 4 present the regression results of these measures. As above, the estimated relationships are positive and statistically significant.

The results of this section provide support to the hypothesis that clerk ideologies provide a window into the ideology of the hiring judge. Some of the measures discussed in this section, such as judge CFscores and measures derived from judicial votes, are likely to be quite reliable measures of ideology in their own right. The strong correlation with CBI scores validates our measure in cases where these other measures are available. More importantly, it bolsters the expected reliability of using CBI scores to measure ideology in the many cases where these other measures are unavailable.

6. Applications

This section presents three applications to illustrate the usefulness of CBI scores. First, we take advantage of the fact that CBI scores are available for

13. A caveat to this analysis is that the clerks hired by a judge may exert an independent effect on the judge's voting behavior. This "reverse causation" is only possible with voting behavior and votes-based measures. This is because both the judge's CFscore and the JCS score are determined before the judge is appointed (and thus before clerks could have an influence).

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lower court judges to examine the geographic distribution of ideologies among district courts and circuit courts. Second, we exploit the dynamic nature of CBI scores to study changes over time in the ideology of individual Supreme Court Justices. Finally, we show how CBI scores permit comparison of judges at different levels of courts by studying how a potential nominee to the Supreme Court would affect the Court's ideological balance.

6.1. Judicial Ideology by Location

An appealing feature of CBI scores is that one may use them to measure of the ideology of a given district or circuit court. CBI scores can, therefore, be used to study differences in judicial ideology by geography. To illustrate this feature, Figure 2 maps the political ideology of district courts and circuit courts. For Panel A, CBI scores are calculated for each district court judge, and averaged over the district courts located in each state. The map suggests that the ideology of district court judges tracks the distribution of political ideology in the country more generally. Panel B of Figure 2 provides the circuit-level average CBI scores for the twelve regional circuit courts and the Federal Circuit. The results suggest that the First Circuit is the most liberal circuit and the Federal Circuit the most conservative.

Because JCS scores may also be used to investigate differences in judicial ideology by circuit or state, it is interesting to compare our results to what would be obtained from relying on JCS scores. Table 5 ranks each circuit by the average ideology of its judges according to both CBI scores and JCS scores. Although the rankings are broadly similar, several circuits are ranked quite differently. In particular, the First Circuit is the most liberal circuit according to CBI scores but only the *ninth* most liberal according to JCS scores. Conversely, the Eighth Circuit is the fourth most liberal circuit according to JCS, but the ninth most liberal according to CBI. These discrepancies can be explained based on the different methodologies that go into the calculation of the CBI scores and JCS scores. For instance, a number of judges who appear liberal under the CBI score (e.g., Boudin, Stahl) from the First Circuit appear conservative under the JCS score because they were appointed by Republican presidents to serve in liberal states represented by Democratic senators.

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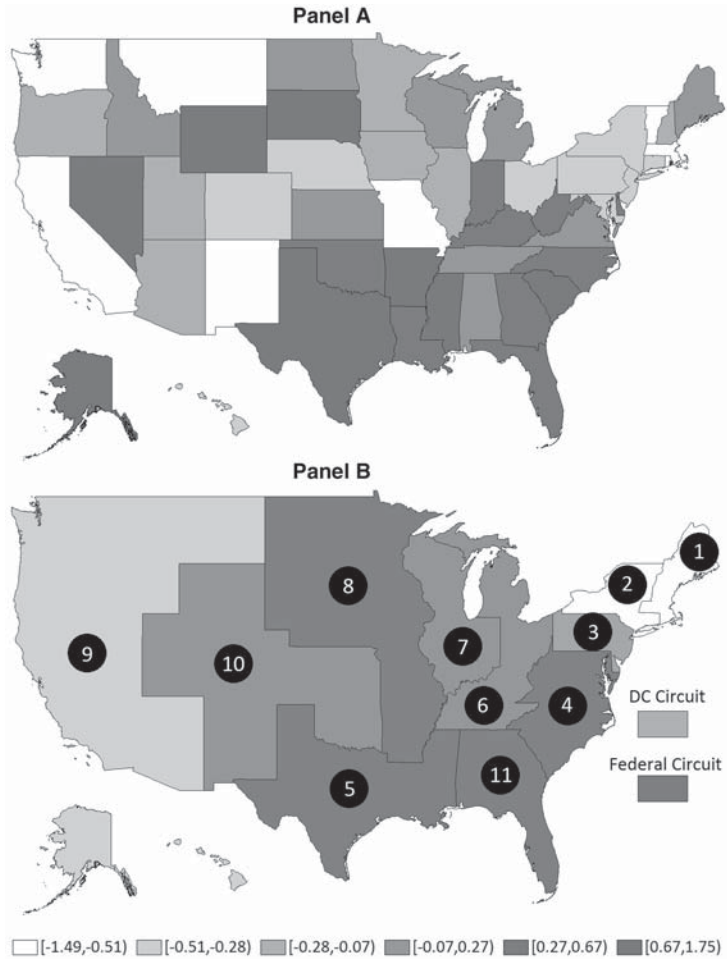


Figure 2. Map of Average CBI Scores in (A) District (by State) and (B) Circuit Courts.

6.2. Ideological Drift

An advantage of CBI scores is that they provide a way to measure changes in a judge's ideology over time. Although year-to-year changes in clerk ideology are more likely to reflect idiosyncratic noise rather than changes in judge ideology, a consistent shift in clerk ideology between the early and late stages of a judge's career may indicate ideological evolution over time.

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Table 5. Circuits Ranking with CBI Score and JCS Score

	Ordinal ranking		Mean score	
Circuit	CBI	JCS	CBI	JCS
1	1	9	−0.69	0.11
2	2	1	−0.49	−0.18
3	5	3	−0.04	−0.02
4	10	8	0.38	0.11
5	11	12	0.38	0.22
6	8	7	0.24	0.10
7	7	5	0.08	0.06
8	9	4	0.30	0.04
9	3	2	−0.39	−0.04
10	6	10	0.06	0.13
11	12	11	0.41	0.18
DC	4	6	−0.24	0.09

To illustrate the dynamic nature of the approach, we investigate changes in the ideology of U.S. Supreme Court Justices over time. We focus this analysis on Supreme Court Justices because we have a longer window of data availability for this group; future work could extend this approach to district court or circuit judges. The specification we consider is:

$$\text{CBI}_{jt} = \alpha_j + \beta_j\, t + \varepsilon_{jt}$$

where the unit of observation is Justice j in term t. The coefficient of interest is β_j, which measures whether the ideology of the Justice has systematically changed over the course of his or her tenure on the Supreme Court.

The results of the analysis are presented in Figure 3. The figure plots the coefficient on the time trend for each Justice on the x-axis with statical significant stars following each Justice's name ($^{*}p < 0.1, ^{**}p < 0.05, ^{***}p < 0.01$), along with horizontal lines for the confidence interval of the estimated coefficients ($p < 0.1$). A coefficient of 0 implies no drift, and the further a Justice is from 0 the more the Justice has drifted. A positive (negative) coefficient implies that the Justice became more conservative (liberal) over time. The coefficients are positioned vertically according to the median year in which we observe the Justice.

For most Justices, no statistically significant shift in ideology is detectable over the course of our sample. However, there are several important exceptions. In particular, the analysis supports the common narrative

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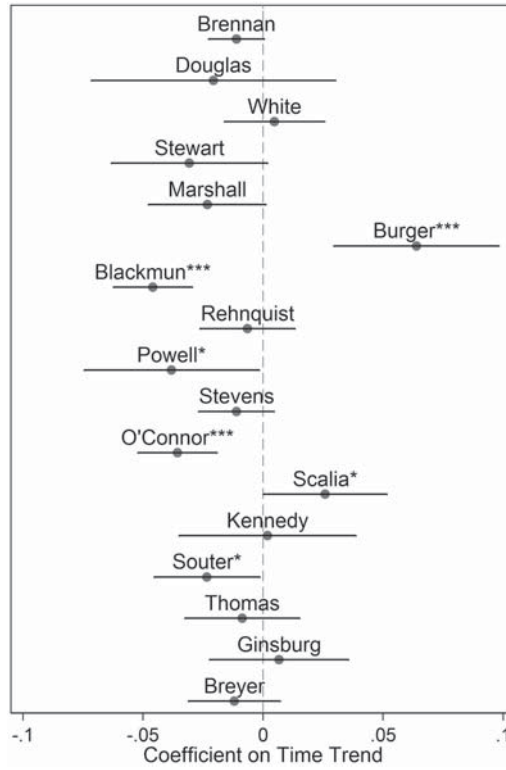


Figure 3. Ideological Drift of Supreme Court Justices over Time.

that Justice O'Connor and Justice Blackmun became more liberal over the course of their careers. The coefficient for each of these Justices is approximately −0.04, which, over the course of a twenty-year tenure, would be associated with a shift in ideology comparable to the difference between Earl Warren and John Roberts. The analysis also suggests that Justice Burger grew more conservative over the course of his years on the Court.

6.3. Assessing Nominations from Lower Courts

One of the advantages of CBI scores is that we can estimate judge ideology for all levels of the federal judiciary. Here, we show how the measure can be used to investigate how a potential nominee to a higher court will

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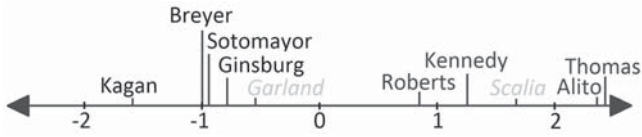


Figure 4. Assessing the Nomination of Garland to the Supreme Court.

affect the higher court's ideological balance. In particular, we can compare the CBI score of the nominee to the CBI scores of the existing members of the court to which the nominee has been nominated.

To illustrate, consider the nomination of Merrick Garland to the Supreme Court on March 16, 2016, following the death of Antonin Scalia. Prior to his nomination, Garland served on the D.C. Circuit Court of Appeals and his CBI score is constructed based on the clerks he hired during our sample period while on that court. Figure 4 compares the CBI score of Judge Merrick Garland to the CBI scores of the current Supreme Court Justices as well as the CBI score for Justice Scalia. The analysis suggests that Garland would be the new median vote on the Court, with a CBI score between Ruth Bader Ginsburg and John Roberts.[14]

A potential concern with the foregoing analysis is that a judge's ideology might change upon being "elevated" to a higher court.[15] Because CBI scores are dynamic and available across multiple levels of courts, they can be used to investigate this concern empirically. During the period for which we have data, two appellate court judges were elevated to the Supreme Court and eight district court judges were elevated to courts of appeals. Figure 5 plots the CBI scores for these judges on each federal court in which they served during our sample period. With only ten data points, no definitive conclusions are possible, but the results do not suggest a systematic change in ideology in either direction.

14. The difference in CBI scores between Garland and Roberts is statistically significant at $p < 0.0143$ level, but the difference in CBI scores between Garland and Ginsburg is not statistically significant.

15. A related concern is that the judge's ideology does not change but the mapping between ideology and CBI score changes, for example, because the judge is now able to select clerks that more closely reflect his or her ideological ideal point.

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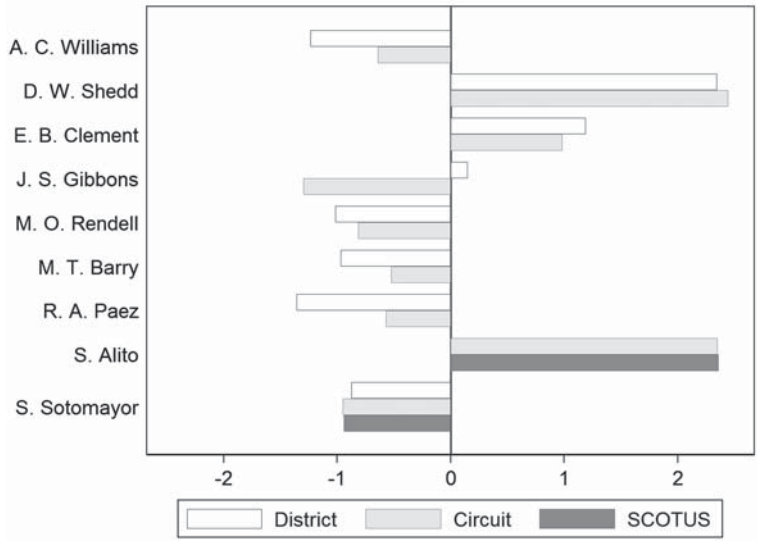


Figure 5. Ideology of Judges Who Served on Multiple Levels of the Federal Judiciary.

7. Selection

A potential concern with the use of CBI scores is that not every clerk has made a political donation, meaning that not all clerks will show up in DIME. In turn, this could lead not only to nonrandom missingness in the CBI scores, but potentially biased measures if clerks who donate systematically differ from clerks who do not. This might specifically be a concern if clerks who are more politically extreme—and thus unrepresentative of the clerks hired by a particular judge—are the ones most likely to donate.

As an initial matter, the nature of the CBI scores may counsel in favor of relying on a dataset with nonrandom missingness in the clerks' CFscores. There are two reasons for this. The first speaks to clerks' twin incentives in both making political donations and also seeking clerkship employment. Logically, a clerk who holds ideological views strongly enough so as to make a political donation (and thus show up in DIME) will be more likely to also consider judicial ideology in finding a suitable clerkship. That is, clerks making political donations will be those most likely to engage in ideological sorting in terms of which judges they apply to for clerkships.

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This suggests that those clerks appearing in DIME, and thus constituting the basis of the CBI scores, will also be those whose ideology corresponds most strongly with those of the judge for whom they work. (To put this differently, a clerk who donates no amount to any kind of political will also likely be one for whom politics tend not to matter; such a clerk might be less concerned about finding an "ideological match" with his or her hiring judge, suggesting a weaker predictive correspondence between his or her ideology and the judges' ideology.) This reasoning suggests that nonrandom missingness in the clerks' CFscores may actually serve to make the CBI scores more precise and reduce random noise coming from politically disinterested clerkship applicants, who place little or no weight on finding an ideological match. There is no way, however, to test this possibility because we do not have access to the missing information.

The second rationale for excluding missing clerks concerns the judges' incentive in hiring (as opposed to the clerks' incentives). If judges have an incentive to hire those who are ideologically like-minded, as our discussion above suggests, then we may also think that the clerkship experience will further the clerks' ideological trajectory. For example, suppose a conservative judge hires both conservative and liberal law clerks; in this case, the ideological correspondence between the judge and his or her conservative clerks may lead them to be more active donors, more networked in conservative legal circles, and more likely to continue on a conservative trajectory. Conversely, for the liberal clerks, clerking for a conservative judge (with whom the ideological connection was already quite weak) might lead them to be less politically active and thus less likely to show up in DIME. Again, just like the last point, however, we have no means of testing such a possibility.

These reasons counsel us toward using CBI scores that drop missing clerks. However, as a robustness check, we impute missing CFscores for clerks using the `missForest R` package (Stekhoven and Buhlmann, 2012). The procedure imputes missing values by fitting random forest models in an iterative fashion. It is a nonparametric machine-learning approach that accounts for nonlinearities and interactions between variables. It also handles datasets in which more than one variable is only partially observed. The accuracy of the imputed values is assessed based on out-of-bag error between observed and imputed values.

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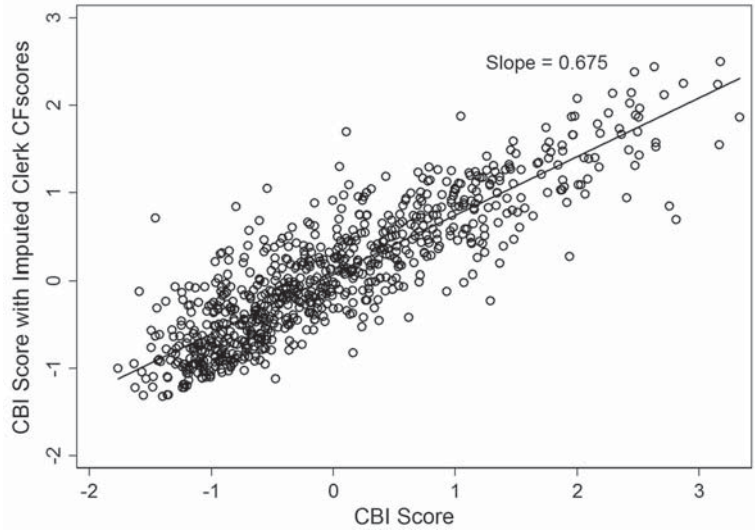


Figure 6. CBI Score with Actual Versus Imputed Clerk Donations.

We include the following variables in the imputation model: (1) gender, (2) law school attended, (3) state in which the hiring judge is located, (4) the hiring judge's own estimated CFscore, and (5) the identity of the president who appointed the hiring judge. For clerks who were successfully linked to the Martindale-Hubbell directory, we additionally include variables capturing (6) years since graduating law school at the time of clerkship, (7) year of birth, (8) current state of residence, (9) two-party presidential vote share in most recent election in the congressional district of residence, (10) type of employment broken down into four general categories: (i) private practice, (ii) government, (iii) academic, or (iv) in-house counsel, and (11) indicator variables capturing whether the clerk is currently employed as (i) a public defender, (ii) a prosecutor or district attorney, (iii) a U.S. Attorney, or (iv) a law partner at a private firm.[16] The model imputes clerk CFscores with reasonable accuracy. The out-of-bag mean square error is 0.29 and a Pearson correlation of 0.64.

16. Note that these variables are not observed for all clerks. See Bonica et al. (2016) for a more detailed description of the dataset and how we obtained these additional variables for clerks.

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Table 6. Robustness Check: The Most Liberal and Conservative Circuit Court Judges Based on CBI Scores

Rank				Appointing	CBI score	
Imputed	Actual	Judge name	Circuit	party	Actual	Imputed
1	1	Fletcher, William A.	9	D	−1.40	−1.37
2	3	Berzon, Marsha S.	9	D	−1.35	−1.36
3	2	Reinhardt, Stephen R.	9	D	−1.36	−1.36
4	12	Wardlaw, Kim Mclane	9	D	−1.20	−1.30
5	7	Pregerson, Harry	9	D	−1.23	−1.29
6	13	Graber, Susan P.	9	D	−1.19	−1.26
7	21	Fuentes, Julio M.	9	D	−1.07	−1.25
8	20	Hall, Cynthia Holcomb	9	R	−1.08	−1.25
9	27	Fisher, Raymond C.	9	D	−1.00	−1.24
10	26	Mckeown, M Margaret	9	D	−1.00	−1.23
11	14	Wood, Diane P.	7	D	−1.18	−1.22
12	10	Murnaghan, Francis D., Jr.	4	D	−1.20	−1.22
13	24	Calabresi, Guido	2	D	−1.03	−1.21
14	22	Tatel, David S.	DC	D	−1.07	−1.21
15	43	Straub, Chester J.	2	D	−0.86	−1.20
178	155	Jolly, Grady E.	5	R	0.97	0.10
179	175	Dubina, Joel F.	11	R	1.41	0.11
180	151	Wilkins, Willliam W., Jr.	4	R	0.86	0.11
181	177	Coffey, John L.	7	R	1.46	0.11
182	181	Suhrheinrich, Richard F.	6	R	1.84	0.14
183	185	Nelson, David A.	6	R	2.09	0.18
184	189	Smith, D. Brooks	3	R	2.42	0.24
185	182	Jones, Edith H.	5	R	1.88	0.27
186	191	Edmondson, J. L.	11	R	2.50	0.36
187	179	Miner, Roger J.	2	R	1.75	0.38
188	188	Alito, Samuel A.	3	R	2.35	0.40
189	186	Williams, Karen Johnson	4	R	2.17	0.41
190	187	Luttig, J. Michael	4	R	2.29	0.61
191	190	Shedd, Dennis W.	4	R	2.45	0.61
192	192	Magill, Frank	8	R	2.87	0.67

We estimate CBI scores for judges using the imputed clerk CFscores as before, normalized by the actual CBI score mean and standard deviation. Figure 6 plots actual CBI scores versus CBI scores generated using imputed clerk CFscores. To demonstrate the extent that selection into the donor pool influences CBI scores, Table 6 repeats the analysis from Table 2, but where the most liberal and conservative circuit court judges are ordered by imputed CBI scores. The results are broadly similar, in that all but one of the top fifteen most liberal judges according to the imputed scores were in the top

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Table 7. Robustness Check: CBI Scores for Supreme Court Justices

Rank			Appointing	CBI score	
Imputed	Actual	Justice name	party	Actual	Imputed
1	6	Ginsburg, Ruth Bader	D	−0.79	−0.88
2	2	Breyer, Stephen	D	−1.00	−0.71
3	9	Marshall, Thurgood	D	−0.59	−0.61
4	4	Fortas, Abe	D	−0.90	−0.59
5	10	Frankfurter, Felix	D	−0.49	−0.49
6	7	Blackmun, Harry A.	R	−0.63	−0.47
7	5	Souter, David	R	−0.81	−0.43
8	8	Stevens, John Paul	R	−0.63	−0.33
9	11	Brennan, William J.	R	−0.37	−0.28
10	12	Stewart, Potter	R	−0.19	−0.19
11	1	Kagan, Elena	D	−1.59	−0.12
12	13	Harlan, John M.	R	−0.18	−0.12
13	16	White, Byron R.	D	0.00	−0.04
14	14	O'Connor, Sandra Day	R	−0.16	0.00
15	3	Sotomayor, Sonia	D	−0.94	0.03
16	15	Douglas, William O.	D	−0.05	0.03
17	17	Powell, Lewis F.	R	0.05	0.11
18	21	Clark, Tom C.	D	0.42	0.35
19	19	Warren, Earl	R	0.38	0.35
20	20	Black, Hugo L.	D	0.41	0.44
21	18	Reed, Stanley	D	0.13	0.45
22	22	Goldberg, Arthur J.	D	0.77	0.46
23	24	Burger, Warren E.	R	0.85	0.75
24	23	Roberts, John	R	0.85	0.82
25	26	Rehnquist, William	R	1.28	1.10
26	27	Scalia, Antonin	R	1.67	1.33
27	25	Kennedy, Anthony	R	1.26	1.42
28	28	Alito, Samuel	R	2.36	1.67
29	29	Thomas, Clarence	R	2.43	2.03

thirty most liberal judges when ranked according to the nonimputed scores, and all but two of the top fifteen most conservative judges according to the imputed scores were among the top thirty most conservative judges when ranked according to the nonimputed scores. Similarly, Table 7 shows that the ordering the Supreme Court Justices by imputed CBI score does not greatly affect the ranking of Supreme Court Justices, as described in Table 3. The exceptions are Justices Kagan and Sotomayor, who have the largest differences between their actual and imputed CBI scores. This is due to the fact that they have a relatively high proportion of clerks with missing

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CFscores because they are new to the court and recent clerks are less likely to have made a donation.

8. Conclusion

The accurate estimation of judicial ideology represents an important initial step in understanding judicial decision-making, judicial behavior, and strategic moves by other branches of government in shaping the judiciary. In this article, we have introduced a new measure of judicial ideology, CBI scores, that uses the ideology of judges' law clerks as a proxy for judicial ideology itself.

CBI scores offer three important advantages over existing measures of judicial ideology. First, because district, circuit, and Supreme Court judges all hire law clerks, CBI scores can be calculated for judges across the judicial hierarchy. This allows us to avoid the potential problems associated with votes-based measures, which rely on judges voting on the same case together. The votes-based measures are very difficult to estimate for district and circuit court judges, who tend to hear cases in smaller groups or, in the case of district judges, by themselves. Second, CBI scores take advantage of a process that repeats on a yearly cycle—law clerk hiring. This allows us to estimate judicial ideology in a dynamic fashion, with ideological estimates that vary over time. This is an improvement over other measures of lower court ideology, such as those relying on the identities of appointing actors, which are, by their very nature, fundamentally static. Lastly, CBI scores do not rely on judges' votes or votes-based outcomes, which, although useful in many contexts, may be susceptible to case selection, bargaining, or other strategic behavior. By contrast, CBI scores are based directly on revealed preferences of important hiring decisions, and there are good reasons to believe ideology plays a large role in who the judges hire.

Several limitations are important to keep in mind when working with CBI scores. First, although we have argued that clerk ideology typically serves as a useful proxy for judicial ideology, there are likely certain judges for whom the correspondence is weak or nonexistent. Some judges may hire clerks without regard to ideology and appeal to clerks from across the ideological spectrum. Some judges may even seek out an ideologically opposed "counter-clerk," whose ideology is diammetrically opposed to the

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judge's ideology. In such cases, CBI scores will represent a particularly noisy measure of the judge's ideology and may be biased toward making the judge appear more moderate than he or she truly is.

A related limitation concerns the issue of selection, and particularly the fact that the clerk donations used to construct the CBI scores are only available for the clerks who chose to donate, and as discussed above, the clerks who donate may differ from those clerks who do not. To the extent that selection into the donating population is driven by clerks' observable characteristics, the imputation approach we utilize in Section 7 provides an adequate correction. However, if donating clerks differ from nondonating clerks in unobservable ways, the imputation approach will fail to fully correct for this bias. Nonetheless, the fact that CBI scores correspond so closely to other measures of judicial ideology suggests that such selection problems, if present, should not be taken to fully undermine confidence in the CBI scores.

With these limitations in mind, we hope the novel capabilities of our measure will allow researchers to ask and answer a variety of interesting questions previously unexplored. We envision these to include inquiries that leverage the temporal component of judicial ideology, including whether judges drift ideologically over time, whether they respond to exogenous shocks presented to them by the other branches of government, and whether they are responsive to public opinion.

Supplementary material

Supplementary material is available at *American Law and Economics Review* online.

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