The Fluidity of Judicial Coalitions

A surprising look at coalitions within the supreme courts of the United States and Indiana

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In June 2001, the United States Supreme Court decided three closely watched deportation cases by 5–4 votes: *Zadvydas v. Davis;*[1] *Calcano-Martinez v. INS.;*[2] and *INS. v. St. Cyr.*[3] The prospective deportees avoided deportation in all three cases; the "liberal" position, if you will, prevailed.[4] The Court at the time consisted of Chief Justice Rehnquist and, in order of seniority, Justices Stevens, O'Connor, Scalia, Kennedy, Souter, Thomas, Ginsburg, and Breyer. Stevens, Souter, Ginsburg, and Breyer were in the majority in all three of these cases; Rehnquist, Scalia and Thomas were in dissent. Kennedy provided the deciding vote in *Calcano-Martinez* and *St. Cyr;* O'Connor in *Zadvydas.*

The voting coalitions in these three cases were quite — but not perfectly — frozen: Four of the five justices in the majority coalitions in all three cases were the same; three of the four justices in the dissenting coalitions were the same. But for O'Connor and Kennedy switching sides in *Zadvydas*, the coalitions would have been identical in all three cases.

This comports to prevailing descriptions of the Court's coalitions at the time: Stevens, Souter, Ginsburg, and Breyer were the "liberals"; Rehnquist, Scalia, and Thomas were the "conservatives"; O'Connor and Kennedy were the "swing votes."[5]

But decided the same month was the well-known *Kyllo v. United States,*[6] in which the Court held by a 5–4 vote that a warrant was required before the government could use a thermal-imaging device to scan a home for heat consistent with high-intensity lamps for marijuana growth. As such, the liberal position also prevailed but the coalitions were quite different. The majority coalition consisted of Scalia, Souter, Thomas, Ginsburg, and Breyer; the dissenting coalition of Rehnquist, Stevens, O'Connor, and Kennedy. Two of the conservatives voted liberal, for the criminal defendant; one of the liberals and both of the swing votes voted conservative.

A year earlier, when the Court had reversed a conviction in another well-known case, *Apprendi v. New Jersey,*[7] the coalitions also did not accord to the popular description: Stevens, Scalia, Souter, Thomas, and Ginsburg were in the majority coalition; Rehnquist, O'Connor, Kennedy, and Breyer dissented. Two of the conservatives voted liberal, for the defendant; one of the liberals voted conservative. Indeed, the core of the majority coalition in *Kyllo* and *Apprendi* were Scalia, Souter, ▸

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Thomas, and Ginsburg; Stevens and Breyer were the swing votes.

Also during June 2001, the Indiana Supreme Court, the state's five-justice court of last resort, decided two criminal law cases by a divided 3–2 vote. In one case, *Segura v. State*,[8] the defendant's argument prevailed; in the other, *Sanchez v. State*,[9] the state's. But though the liberal position prevailed in the first case and the conservative in the second, the change in outcome was not a function of a swing vote. Rather, the coalitions in the two cases were completely different. The court at the time consisted of Chief Justice Randall T. Shepard and, in order of seniority, Justices Brent E. Dickson, Frank Sullivan, Jr. (an author of this article), Theodore R. Boehm, and Robert D. Rucker. The majority coalition in *Segura* (where the liberal position prevailed) consisted of Dickson, Boehm, and Rucker; the minority of Shepard and Sullivan. In *Sanchez* (where the conservative position prevailed), the majority coalition consisted of Shepard, Dickson, and Boehm; the minority of Sullivan and Rucker. To the extent anything can be generalized from these two cases, it is that three of the five justices — Dickson, Boehm, and Sullivan — were swing votes: Each voted with the liberal position in one of these cases and the conservative in the other.

The seven cases just discussed illustrate that the coalitions comprising the majority and minority positions can and do vary in tightly split decisions of the United States Supreme Court and state courts of last resort (referred to in this article as state supreme courts). But how fluid or stable are those coalitions? Were the voting coalitions in closely divided cases on the 2000–01 United States Supreme Court stable (as *Zadvydas*, *Calcano-Martinez*, and *St. Cyr* suggest) and

the coalitions in *Apprendi* and *Kyllo* simply anomalies? Were the voting coalitions in closely divided cases on the 2001 Indiana Supreme Court as fluid as *Segura* and *Sanchez* suggest or were they in fact much less fluid? More broadly, were voting coalitions on the U.S. Supreme Court more fluid in the '50s than in the '90s? How does the U.S. Supreme Court compare to state supreme courts from this perspective?

We develop in this article an index that measures the concept of fluidity in coalitions between judges in supreme courts in American jurisdictions.[10] If, in one court, the same coalition of judges always votes together, in either the majority or the dissent, we would observe low fluidity due to stable coalitions. A different court, in which judges align in majority and dissent in different coalitions in each opinion, would have greater fluidity; this court would have less stable coalitions. The index captures where each court lies in the spectrum from no fluidity whatsoever — frozen, totally stable coalitions, i.e., the same judges vote in exactly the same coalitions in every case — to absolutely fluid coalitions, where each judge votes proportionately with every other one. The index ranges from zero (0 percent fluidity) to one (100 percent fluidity). For this index to be useful, the value that it produces should allow the comparison of courts of different sizes. Our index springs from a quadratic process, and we show that a linear index is inadequate.

The primary contribution of this article is the development of this *index of fluidity of judicial coalitions*.[11] The index measures how a court's coalitions form in what we refer to as "tightly split" opinions, such as 5–4 opinions in a nine-member court, or 4–3 opinions in a seven-member court.[12] We

know of no prior metric that can measure coalition formation in court decisions.

A secondary, implicit, but perhaps nontrivial contribution is that, when comparing the relative degree of coalition voting by courts, the relevant period that we use is the time during which the composition of the court is unchanged. This coincides with the time period during which a particular justice is the court's most-junior justice as the tenure of that justice determines, by definition, the period of time during which the membership of the court remains unchanged. We observe that this is at odds with the popular and conventional focus on, and naming of, eras of courts by the name of the chief justice. During a single chief justice's tenure, old associate justices leave the court and new ones take their seats, frustrating the idea that the court is the same. Our approach, by contrast, focuses on the most recently appointed justice, the "junior justice," as the one who determines the composition of the court. While that justice is the junior justice, the composition of the court truly does not change.[13] When we refer to the "Breyer court," for example, we refer to the period when Justice Breyer was the junior justice, from his appointment in August of 1994 to the appointment of Chief Justice Roberts in September of 2005. The junior justice, accordingly, may well be the chief justice, as was the case from the appointment of Chief Justice Roberts until that of Justice Alito in January of 2006.

The literature on judicial behavior, including coalition formation, is enormous.[14] The study of coalitions on the United States Supreme Court is not new, and various perspectives or explanations have been used in analyzing it.[15] However, the dominant approach, especially recently, focuses on a division from political left to right.[16] Several scholars point out this is insufficient.[17] Joshua Fishman and Tonja Jacobi have even a concrete proposed second dimension, from pragmatism to legalism,[18] and in older data Glendon Schubert also finds two main dimensions (economic and civic liberalism) and some minor scales (that might be abbreviated as fiscal, activist, statist, and supervisory [of lower courts] attitudes).[19] We counter that an

advantage of the proposed index is that the index remains agnostic with respect to direction or even the number of dimensions in the decision space.[20]

Our paper joins the above descriptive literature because we do not propose an optimal level of coalition formation, which further research may change. The literature on judicial incentives, related to the appointment process, is also vast, and includes prior work by some of us.[21]

INTRODUCING THE INDEX AND DATA

The target of our analysis is the formation of coalitions in courts of constant composition that have a number of judges that is small and odd. The United States Supreme Court or that of Canada, with nine judges, are leading examples; as are others with seven, such as the Supreme Court of Australia and the courts of last resort of Arizona, California, Connecticut, Massachusetts, and New York. The index also applies to jurisdictions with five-member supreme courts, like Indiana.

Given the variety of sizes of courts, and the reality of split opinions, the question arises how to compare the fluidity of coalitions in voting on tightly split opinions in different courts. We propose such a measure, apply it to the United States Supreme Court from 1946 to 2014, the period covered by supremecourtdatabase.org, and to a period of the Indiana Supreme Court from 1999 to 2010, and discuss the results.

The mathematical formulas producing the index appear in this article's appendix, which is available at law.duke.edu/judicature/volume100-number3. The proposed index of fluidity of judicial coalitions begins by calculating how often each justice sides with each other justice in tightly split opinions. In other words, the springboard is a set of pairwise percentages of agreement. We derive the agreement percentage that would exist in a perfectly fluid court, one where each justice agrees the same with every other justice because the court issues the same number of tightly split opinions from every possible coalition. This is the average rate of agreement a. The next steps of calculating the index are to calculate the squared differences of each actual pairwise rate of agreement from the average rate of agreement, to take the aver-

age of the squared differences, and compute the square root s of the average squared difference. We also derive the maximum square root r of the averaged squared differences, what would correspond to utter lack of fluidity. The index is one minus the ratio of the square root of the squared differences to the maximum square root of averaged squared differences, $1 - s/r$. If a court's tightly split opinions come from a single coalition, then this ratio will be one and the value of the index will be zero, i.e., the voting coalitions in every tightly split opinion are exactly the same. The opposite extreme is a table of justice agreement where each cell has the average value of justice agreement because each justice has agreed with every other justice equally; in this case, the s/r ratio will be zero and the index will be one, i.e., justices ally with each other exactly proportionately. All other tables of justice agreement, where each justice agrees with each other justice at other rates, produce index values between zero and one. The value of the index approaches one as justices agree with each other more proportionately.

The index of fluidity of judicial coalitions is standardized to the size of courts and allows not only comparisons between courts of the same size, but also to courts of different sizes. A court of any size, as long as it has an odd number of judges, will produce a series of tightly split opinions under constant composition of the court, or under the same junior justice. Those tightly split opinions, regardless of the court's size, can produce index values ranging from 0 to 1. In every case, if the index produces the value of zero, then the court issued all tightly split opinions using a single coalition. At the opposite extreme, again regardless of the court's size, if the index takes a value of 1, then the court issued its tightly split opinions proportionately from every possible coalition.[22] In practice, both extremes seem farfetched. A court where a single majority coalition issues all tightly split opinions would likely seem dysfunctional from various perspectives. Similarly, the opposite extreme of no tendency for some judges to vote together (that would be necessary for index values of very high fluidity) contradicts notions of the existence of any

commonality of personal judicial and legal philosophies or even notions of justice.

The index of fluidity of judicial coalitions is sensitive to the composition of coalitions.[23] For example, consider two courts that produce their tightly split opinions mostly from two coalitions. Those coalitions can be very similar. The second majority coalition may be the minority of the first coalition with the addition of a single swing vote. Yet, the two coalitions can have greater differences, if several justices change sides. This latter case would lead to a greater value of the index of fluidity of judicial coalitions. Take the example of a nine-member court. Two coalitions of equal productivity with a single swing vote produce an index value of .12, whereas two coalitions with four swing votes, where the majority loses two votes to the minority and gains two votes from the minority, produce an index of fluidity of .34.[24]

A limitation of the index of fluidity of judicial coalitions is that it springs from only the tightly split opinions. Other opinions, where the majority had superfluous votes, do not influence the value of the index but may hide important phenomena. The frequency of tightly split opinions may also be informative in its own merit, yet the index does not capture it. However, figure 1 (page 41) uses the thickness of the lines marking the value of the index to express the frequency of tightly split opinions.[25]

We stress that the index is standardized with respect to court size but need to explain the importance of the number of possible coalitions, which increases exponentially with the size of the court. The index runs from zero to one as a court's coalitions go from a single dominant coalition to the opposite extreme of proportional issuance of opinions from all possible coalitions. A smaller court has a much smaller number of possible coalitions.[26] For example, a five-member court has ten possible coalitions and will produce a high index of coalition fluidity if it forms seven or eight coalitions to issue opinions proportionately. But a nine-member court has 126 possible coalitions and a vast number of possible ways that its members can ally with others.[27] In a nine-member court, the formation of seven or eight coalitions can either correspond to fairly

little change between coalitions or to large changes, with correspondingly different values of the index of fluidity of coalitions. Given the much greater range of coalitions available to members of a nine-member court, and especially if the seven or eight coalitions we observe do not differ much, the values of the fluidity index that they would produce could be much smaller than those of the five-member court.

This feature of the index is not in harmony with median voter models of judicial voting that use few dimensions. Median voter models would tend to produce similar counts of coalitions regardless of size of the court. For example, consider a one-dimensional model of judicial decisions, perhaps with the single dimension running from conservatism to liberalism governing the resolution of all disputes. In this model, the median justice separates the liberal block from the conservative block. The only disputes that give rise to tightly split opinions are those arising adjacent to the median justice.[28] If this model drove all judicial decisions, then, regardless of court size, the tightly split opinions would tend to come from only two groups, either from the conservative justices plus the median justice, or from the liberal justices plus the median justice. In other words, with minor caveats, a median voter model with few dimensions indicates both a limited number of coalitions and similarity between the coalitions, because each court would have one swing vote per dimension.

The tension between the index and median voter models of judging is that, whereas the index treats all variation between coalitions the same way, median voter models of judging determine the absolute number of coalitions in tightly split decisions. For median voter models, the size of the court is irrelevant for the expected number of coalitions. By contrast, for the index, the potential existence of more coalitions in a larger court means that increasing the size of the court without increasing the variability of coalitions produces a smaller value of the index. If, for example, adjudication was driven by a single dimension, then all courts would have two coalitions in tightly split opinions. Or, if adjudication was driven by two dimensions, then all courts would have four coalitions in tightly split opinions. Under the assumptions of such a median voter model, larger courts would still only have two or four coalitions and tend to produce smaller values of their fluidity index. This would be most pronounced if judging followed a one-dimensional median voter model. A fuller discussion of the relation of the index to median voter judging is at the end of the appendix.

The existence of the Supreme Court Database (supremecourtdatabase.org) allows us to apply this index to measure the fluidity of coalitions in periods when the United States Supreme Court had stable membership and issued a sufficient number of 5–4 opinions. A limiting factor is that the database presently only reaches back to 1946, not containing the voting details for earlier decisions. However, for the period after 1946, the database offers the composition of every majority and dissent.

We have constructed a similar database for the Indiana Supreme Court covering the lengthy period from Nov. 19, 1999, to Sept. 30, 2010, during which there was no change in the membership of that court.

The logic of the index means that we count opinions rather than disputes. A single opinion may give closure to several disputes with different party names.[29] Thus, when several disputes are listed in the database but they all receive disposition by a single opinion, we count that as a single opinion.

To repeat, we only count 5–4 opinions of the U.S. Supreme Court and 3–2 opinions of the Indiana Supreme Court. We only count 5–4 (3–2) opinions even if recusals or vacancies may produce a tightly split opinion of a smaller size, such as a 4–3 opinion by the experience of two

TABLE 1. JUSTICE AGREEMENT FOR THE 5-4 OPINIONS OF THE COURT WITH POWELL AND REHNQUIST AS THE JUNIOR JUSTICES

	D.	BR.	ST.	WH.	MAR.	BUR.	BL.	P.	REHN.
DOUGLAS	–	.84	.62	.39	.87	.08	.19	.21	.09
BRENNAN		–	.56	.46	.88	.11	.24	.15	.08
STEWART			–	.20	.68	.33	.31	.39	.36
WHITE				–	.41	.58	.61	.47	.57
MARSHALL					–	.05	.17	.19	.06
BURGER						–	.83	.80	.95
BLACKMUN							–	.63	.79
POWELL								–	.83
REHNQUIST									–

TABLE 2: JUSTICE AGREEMENT FOR THE 5-4 OPINIONS OF THE BREYER COURT

	R.	ST.	O'C.	SC.	KEN.	SOU.	TH.	GIN.	BR.
REHNQUIST	–	.06	.73	.87	.80	.08	.86	.09	.13
STEVENS		–	.27	.10	.22	.89	.15	.88	.85
O'CONNOR			–	.64	.61	.26	.68	.24	.31
SCALIA				–	.75	.14	.90	.14	.09
KENNEDY					–	.20	.75	.19	.23
SOUTER						–	.14	.89	.85
THOMAS							–	.11	.07
GINSBURG								–	.86
BREYER									–

vacancies on the United States Supreme Court. The production of the index requires a significant number of opinions and the handful of such smaller tight splits does not allow the index to be meaningfully applied to them.

THREE EXAMPLES

Before offering the history of the fluidity values for the United States Supreme Court, we walk over three calculations of the index.

The Powell-Rehnquist Court

Consider the opinions issued while Justices Powell and Rehnquist were the junior justices.[30] The court at the time consisted of Chief Justice Burger and, in order of seniority, Justices Douglas, Brennan, Stewart, White, Marshall, Blackmun, Powell, and Rehnquist. The first 5–4 opinion was issued on Feb. 22, 1972,[31] and the last 5–4 opinion before the appointment of the next justice, Justice Stevens, was issued on June 30, 1976.[32] The number of 5–4 opinions in this period is 109. As this is a nine-member court, we know that the number of possible five-member coalitions is 126.[33] Rather than a broad number of coalitions each issuing one or a very small number of opinions, we observe lack of fluidity. Twenty-six coalitions issue opinions, i.e., only 21 percent of the possible number of coalitions actually form. Some coalitions issue only one or two opinions (11 coalitions issue one opinion and eight coalitions issue two opinions) but many opinions come from a small number of coalitions.

The most prolific coalition produces 49 opinions, 34 percent of all the tightly split opinions. The Court's alignment for these cases consists of Burger, White, Blackmun, Powell, and Rehnquist in the majority and Douglas, Brennan, Stewart, and Marshall in dissent.

The second most prolific coalition, that produces 18 opinions, 16.5 percent, has Burger, Stewart, Blackmun, Powell, and Rehnquist in the majority, and Douglas, Brennan, White, and Marshall in dissent. Essentially, the difference from the most prolific coalition is that Stewart and White exchange positions, a difference of two swing votes. Thus, this is not a case where

a constant 4–4 split exists and one swing vote changes the minority into a majority.

The third most prolific coalition, that produces ten opinions, 9 percent, has Justices Douglas, Brennan, Stewart, White, and Marshall in the majority, and Burger, Blackmun, Powell, and Rehnquist in the dissent. This coalition is similar to the second most prolific one, in that the four justices there in the dissent are in the majority here with Stewart joining them as the swing vote.

The fourth most prolific coalition, producing only five opinions or 4.6 percent, has Burger, Blackmun, Brennan, White, and Rehnquist in the majority and Douglas, Marshall, Powell, and Stewart in dissent. This is a new coalition; the one similarity with the more prolific ones is that Douglas and Marshall are on the same side.

To calculate the index of fluidity, as the appendix explains, we produce the table of justice agreement, table 1. The justices appear in the order that they were appointed. Squaring the differences of each cell from the average cell value of a = .4444, averaging them and taking the square root produces a value of s = .2804. Compared to the root of the average of squared differences of the most extreme lack of fluidity that a nine-member court can produce, r = .4969, and subtracting

from one gives the value of the index of fluidity f = .44.[34]

Having seen that the period with Powell and Rehnquist as the junior justices produces an index of fluidity of judicial coalitions of .44, we turn to a different period of the court, when Justice Breyer was the junior justice.

The Breyer Court

Justice Breyer holds the record for the longest service as the junior justice and thus produces the longest term of constant composition in the Supreme Court. The court consisted of Chief Justice Rehnquist and, in order of seniority, Justices Stevens, O'Connor, Scalia, Kennedy, Souter, Thomas, Ginsburg, and Breyer. The court produced 191 tightly split opinions from Nov. 14, 1994[35] to June 27, 2005,[36] the last tightly split opinion before the next appointment, that of Chief Justice Roberts. This produces an ample number of opinions that could have, in theory, occupied the entire spectrum of the 126 possible coalitions. However, the court in this period aligns in only 37 coalitions, i.e., only 29 percent of the maximum. Moreover, only three produce a number of opinions greater than five.

The most prolific coalition produces 88 opinions, or over 46 percent of the total. The majority has Rehnquist, O'Connor, Scalia, ▶

Rather than a broad number of coalitions each issuing one or a very small number of opinions, we observe lack of fluidity [in the Powell-Rehnquist court]. Twenty-six coalitions issue opinions, i.e., only 21 percent of the possible number of coalitions actually form.

TABLE 3:   JUSTICE AGREEMENT FOR THE 3–2 OPINIONS
OF THE INDIANA SUPREME COURT WITH
RUCKER AS THE JUNIOR JUSTICE

	SH	D	SU	B	R
SHEPARD	–	.41	.64	.47	.26
DICKSON		–	.23	.41	.45
SULLIVAN			–	.36	.43
BOEHM				–	.35
RUCKER					–

Kennedy, and Thomas. The minority is Stevens, Souter, Ginsburg, and Breyer.

The second most prolific coalition produces 31 opinions, 16 percent of the 5–4 opinions. The majority has Justices Stevens, O'Connor, Souter, Ginsburg, and Breyer. Justices Rehnquist, Scalia, Kennedy, and Thomas form the minority. This alignment arises from the minority of the first coalition with the addition of O'Connor as the swing vote.

The third most prolific coalition produces 22 opinions, 10 percent of the total. The majority consists of Justices Stevens, Kennedy, Souter, Ginsburg, and Breyer. The minority is Rehnquist, O'Connor, Scalia, and Thomas. This alignment arises from the minority of the first coalition being joined by Kennedy as the swing vote. The next coalition issues five opinions, 2.6 percent of the total.

The same four liberal justices, in dissent, or with either Kennedy or O'Connor, produce the top three coalitions. By contrast, the top three coalitions of the Powell-Rehnquist court have greater differences in their composition, and a notable number of opinions came from a fourth and different alignment of the justices.[37] The index does reflect this difference.

Again, the starting point is the production of the table of justice agreement, table 2. Each cell holds the percentage of agreement between the justices that corresponds to the row and column of each cell in the 5–4 opinions that the court issued with Breyer as the junior justice.

The index reveals the less fluid nature of the Breyer court. Squaring the differences of each cell from their average value of a = .4444, averaging them and taking the

square root produces a value of s = .3279. Comparing to the root of the average of squared differences of the most extreme lack of fluidity that a nine-member court can produce, r = .4969, and subtracting from one gives the index of fluidity of judicial coalitions, $f = 1 - s/r$ = .34.

The fluidity of the Breyer court at .34 is meaningfully lower than that of the Powell court at .44.

The Rucker Court

Deriving the index of fluidity of judicial coalitions for other courts should be very informative. However, the absence of the corresponding databases hampers that effort. Our junior coauthor compiled such a database.[38] The data cover the Indiana Supreme Court during the period when Justice Rucker was its junior justice, from

issuing its first 3–2 opinion on Dec. 13, 1999,[39] to its last one on Oct. 5, 2010.[40] The composition of the court consists of Chief Justice Shepard, and Justices Dickson, Sullivan, Boehm, and Rucker.

The number of 3–2 opinions in this period is 176. As this is a five-member court, we know that the number of possible three-member majority coalitions is ten. The court in this period actually does align in nine coalitions, i.e., 90 percent of the total number of possible coalitions actually form. Each of these nine coalitions produces at least six opinions.

The most frequently forming coalition consists of Shepard, Sullivan, and Boehm in the majority with Dickson and Rucker in dissent. This coalition forms in 41 tightly split opinions or 23 percent of the total.

The second most frequently occurring coalition — which formed in 29 cases (16 percent) — consists of Shepard, Sullivan, and Rucker in the majority with Dickson and Boehm in dissent.

TABLE 4:   U.S. SUPREME COURT FLUIDITY, 1946-2014, AND
INDIANA SUPREME COURT FLUIDITY, 1999-2010

JR. JUSTICE	1ST OPINION	LAST	FLUIDITY	N	N/MO
VINSON	11/18/1946	6/27/1949	0.465360	83	2.6
MINTON	6/5/1950	5/25/1953	0.764982	34	0.9
WHITTAKER	4/8/1957	6/30/1958	0.286126	39	2.6
STEWART	12/8/1958	4/2/1962	0.318287	84	2.1
GOLDBERG	11/5/1962	6/7/1965	0.453161	41	1.3
FORTAS	12/6/1965	6/12/1967	0.509823	41	2.2
BLACKMUN	12/15/1970	6/28/1971	0.557494	31	4.8
POWELL	2/22/1972	6/30/1976	0.435688	109	2.1
STEVENS	7/1/1976	6/26/1981	0.574706	120	2.0
O'CONNOR	12/1/1981	7/7/1986	0.454422	148	2.6
SCALIA	11/17/1986	6/26/1987	0.381204	42	5.7
KENNEDY	4/25/1988	6/27/1990	0.312371	90	3.4
THOMAS	4/6/1992	6/28/1993	0.614859	32	2.1
BREYER	11/14/1994	6/27/2005	0.342769	191	1.5
ALITO	5/30/2006	6/29/2009	0.253321	82	2.2
KAGAN	3/29/2011	6/30/2014	0.293895	64	1.6
RUCKER (IN.)	12/13/1999	10/5/2010	0.776535	176	1.4

Two other coalitions form in 25 (14 percent) cases each. The first consists of Shepard, Dickson, and Sullivan in the majority with Boehm and Rucker in dissent. The second consists of Shepard, Dickson, and Boehm in the majority with Sullivan and Rucker in dissent.

A fifth coalition consisting of Dickson, Boehm, and Rucker in the majority with Shepard and Sullivan in dissent forms in 18 cases or 10 percent of the total.

This presentation of the judicial coalitions for the Rucker court — in which 90 percent of the possible coalitions form and five coalitions account for 78 percent of the split decisions — suggests a much greater fluidity than the Breyer court, in which only 29 percent of the possible coalitions actually form and three coalitions account for 74 percent (two coalitions for 62 percent) of the tightly split decisions. The index confirms this.
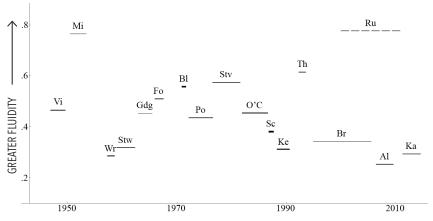
Table 3 is the Rucker court's table of justice agreement. The Rucker court produces a square root of differences from average agreement of $s = .1198$. Compared to the most extreme lack of fluidity, $r = .4899$, the Rucker court gives a fluidity index, $f = 1 - s/r$, of $f = .78$. This is a value greater than the fluidity observed in any period of the United States Supreme Court.

SUPREME COURT COALITION FLUIDITY 1946-2014

We calculate the fluidity of 5–4 coalitions of the United States Supreme Court from 1946 to 2014, the period covered by the Supreme Court Database, and 3–2 coalitions of the Indiana Supreme Court from 1999 to 2010. Table 4 shows the results and figure 1 illustrates them.

The first column of table 4 holds the name of the junior justice. The second column holds the date of the first tightly split opinion, in the format of month/day/year. The third column holds the date of the last opinion. The fourth column presents the fluidity index value. The next column, titled N, gives the number of tightly split opinions in the period. The final column gives the number of tightly split opinions per month.[41] We do not present periods with fewer than 30 opinions.[42] The last opinion of the Kagan court is the last one included by the database,

rather than the actually last as of the time of this writing.

Figure 1 illustrates the data reported in table 4. The horizontal axis holds dates from early 1946 to mid-2014, the end of the database. Each horizontal line corresponds to one composition of the court. Each line begins at the date of the first tightly split opinion issued with that composition and ends at the date of its last tightly split opinion. The vertical axis measures the fluidity index. Accordingly, lines that appear higher correspond to periods of greater fluidity of coalitions, to periods when justices aligned in more different ways when issuing tightly split opinions. Lower lines correspond to periods when justices' coalitions were less fluid, to the utilization of fewer coalitions when issuing tightly split opinions. The thickness of the lines corresponds to the number of tightly split opinions issued by that composition of the court per month. The letters above each line signal the surname of the junior justice of that period. The figure also includes the Rucker court for comparison as a dashing line. The discontinuities are due to us not reporting the index for periods with fewer than 30 opinions.[43]

The height combined with the thickness of the lines reveals something about periods with comparable duration. Compare the five-year period of the Stevens court to that of O'Connor's court. The Stevens court produces greater fluidity and

fewer tightly split opinions (per month but also overall) than the O'Connor court.

DISCUSSION

These data reveal two differences. First, the United States Supreme Court seems to switch to lower fluidity values with the appointment of Justice Scalia. While presently this switch is not statistically significant, the average liquidity before Scalia is above .48 whereas the average liquidity from Scalia on is below .37. As we intend to demonstrate in subsequent work, it is the change that comes closest to being statistically significant. Thus, if a change occurred, it likely manifested with Justice Scalia, his appointment, or surrounding changes in the political environment.

Second, the United States Supreme Court exhibits fluidity far smaller than that exhibited by the Indiana Supreme Court. Additional research may point to more differences but we hypothesize that the differences in judicial selection methods, political expectations, and public scrutiny help explain the dramatic variation between the index for the United States and the Indiana Supreme Court.

Consider first the method of selection of justices of the United States Supreme Court: nominated by the President but subject to Senate confirmation. Since at least the Nixon-Humphrey campaign of 1968, Republican and Democratic candidates for President have promised ▶

FIGURE 1: **U.S. SUPREME COURT FLUIDITY, 1946-2014 AND RUCKER COURT FLUIDITY (DASHING)**

Each line represents the number of tightly split opinions from a particular coalition, denoted by the name of the court's junior justice. The span of the line indicates the period of time over which the tightly split opinions were issued; a thicker line represents more tightly split opinions per month. The Rucker court is included for comparison.

the appointment of Supreme Court justices whose views accord with theirs.[44] While Presidents have not always been successful in this regard — either because of the failure to secure Senate confirmation or because of post-appointment surprises from the justices themselves — history shows general success in this regard.[45] Presidents nominate justices whom they believe will tend to cast conservative/Republican or liberal/Democratic votes; for the most part, those justices do, and so the coalitions coalesce around the conservative and liberal positions and are not very fluid. As an exception that demonstrates the point, consider the widespread expressions of astonishment that followed Chief Justice Roberts's vote to sustain the constitutionality of Obamacare.[46]

We offer this description as contrast to the way in which Indiana Supreme Court justices are appointed, not as a comprehensive explanation for the voting behavior of United States Supreme Court justices. Justices of the Indiana Supreme Court are appointed by the state's governor but the governor's hand is constrained by having to pick from a list of three nominees presented by the Indiana Judicial Nominating Commission, a constitutional body consisting of three lawyers elected by the lawyers of the state, three nonlawyers appointed by the governor, and the incumbent chief justice, who serves as the commission's chair.[47] Perhaps because of this selection process, perhaps also for other reasons, Indiana has no tradition of governors campaigning for office on promises to appoint justices of a particular kind.

Indiana has had this selection process since the 1970s; 11 justices have been appointed under it. The governor does not have the freedom to select an appointee whose views accord with his. And our observation is that because of this, governors have focused on factors other than likely voting behavior in making their decisions. While we acknowledge that no governor has ever appointed a justice not of his own political party, we also observe that the Indiana Constitution mandates that the appointment be made "without regard to political affiliation."[48] The intermediation of the Nominating Commission process appears to have severed justices' pre-appointment partisanship from any expectation that the

justices' voting behavior would be in accord with the appointing governors' expectations.

As a consequence of the difference in selection process, we believe that a justice of the Indiana Supreme Court is much less likely than a justice of the United States Supreme Court to bring to the court predictable, party-line voting behavior. Because of this, Indiana justices are much less likely to find themselves regularly aligned with any other particular members of the court. This produces much more fluid coalitions in closely divided cases — and a much higher index of fluidity.

We recognize that the foregoing hypotheses for the differences between the index as calculated for the United States Supreme Court and Indiana Supreme Court suffer from a variety of limitations, including the fact that in looking only at the Powell, Breyer, and Rucker courts, something exceptional could influence one or more of those courts that would make its index anomalous. We do not purport to explain the differences in the index but merely begin discussion and invite further research on other courts.

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1 *Zadvydas v. Davis,* 533 U.S. 678 (2001).

2 *Calcano-Martinez v. INS.*, 533 U.S. 348 (2001).

3 *INS v. St. Cyr,* 533 U.S. 289 (2001).

4 We use the term *liberal* to signify positions associated with the political left in the United States. Whereas the term progressive might be considered more accurate by some, we feel this usage is too recent and politically laden.

5 *See, e.g.,* R. Randall Kelso & Charles D. Kelso, *Swing Votes on the Current Supreme Court: The Joint Opinion in Casey and Its Progeny,* 29 Pepp. L. Rev. 4 (2002) (identifying Kennedy, O'Connor, and Souter as the primary swing votes).

6 *Kyllo v. United States,* 533 U.S. 27 (2001).

7 *Apprendi v. N.J.,* 530 U.S. 466 (2000).

8 *Segura v. State,* 749 N.E.2d 496 (Ind. 2001).

9 *Sanchez v. State,* 749 N.E.2d 509 (Ind. 2001).

10 By this we mean courts consisting of an odd number of members, all of whom participate in every opinion of the court included in our study. As will be apparent, we do not consider opinions on which less than all of the full number of justices voted.

11 We should stress that the naming of the judicial coalitions index was contested among the coauthors. We initially gravitated toward *independence* or *autonomy* as adjectives to attach to the index. Those, however, create a misleading juxtaposition to a dominated or manipulated court, which would not even have split opinions. The adjectives *predictability, constancy,* or *stability* carry normative desirability whereas our intuition is that constant and predictable coalitions do not indicate the desirable state (of a court, justice, or case selection). Pejorative adjectives, such as *polarization*, are perhaps also excessively negative. This leaves adjectives such as *fluidity, polarity, diffusion,* or *dispersion,* the last two of which are already appropriated by optics and statistics. Other possible terms are judicial coalition *proportionality* or judicial coalition *usage* or *occurrence.* A single occurrence of a coalition is not what the index measures, making inappropriate the term index of coalition *usage.* Rather, the index measures the extent to which certain judges ally with other judges proportionately. Thus, the most descriptive term might be *index of proportionality of coalition formation in courts,* the length of which is prohibitive. The term *index of judicial coalition fluidity* seems sufficiently unladen or ambiguous from a normative perspective as to appear the most desirable from a set of imperfect choices.

12 We recognize that the study of non-unanimous opinions other than tightly split opinions, e.g., 6–3 or 5–2, might produce additional important information about the relative degree of coalition voting among courts and anticipate amplifying this work with such study in the future. Yet, the construction of the index requires us to only use tightly split opinions. *See* Appendix, footnote 51.

13 As will become apparent, a period of time during which there is one or more vacancies on a court does not affect this conclusion as the index is only applied to decisions made by the court when it is at full strength. At present, we have only applied the index to courts (the Supreme Courts of the United States and of Indiana) that do not permit

the use of a substitute justice when a justice recuses or otherwise does not participate. Some important courts do employ such a practice. *See, e.g.,* Del. Const. Art. 4, § 12 (providing for the appointment of judges from lower courts to sit in the Supreme Court temporarily in certain circumstances). Application of the index to the decisions of such courts will need to take this practice into account.

[14] This literature review relies heavily on the extensive literature review in Joshua B. Fischman & Tonja Jacobi, *The Second Dimension of the Supreme Court,* 57 Wm. & Mary L. Rev. (forthcoming 2016).

[15] *See, e.g.,* Glendon Schubert, *The 1960 Term of the Supreme Court: A Psychological Analysis,* 56 Am. Pol. Sci. Rev. 90 (1962); Glendon Schubert, *Judicial Attitudes and Voting Behavior: The 1961 Term of the United States Supreme Court, 28* L. & Contemp. Probs. 100 (1963); L.L. Thurstone & J.W. Degan, *A Factorial Study of the Supreme Court, 37* Proc. Nat'l Acad. Sci. 628 (1951).

[16] *See, e.g.,* Frank B. Cross & Emerson H. Tiller, *Judicial Partisanship and Obedience to Legal Doctrine: Whistleblowing on the Federal Courts of Appeals,* 107 Yale L.J. 2155 (1998) (finding that the ideological composition of the bench influenced outcomes despite the underlying legal standard of deference to the administrative agency); Tonja Jacobi, *Competing Models of Judicial Coalition Formation and Case Outcome Determination, 1* J. Legal Analysis 205 (2009) (demonstrating the tension between reaching a judge's ideal outcome and assembling a winning coalition). See generally literature collected in notes 19 to 23 of Joshua B. Fischman & Tonja Jacobi, *The Second Dimension of the Supreme Court,* 57 Wm. & Mary L. Rev. (forthcoming 2016).

[17] *See* Paul H. Edelman, *The Dimension of the Supreme Court*, 20 Const. Comm. 101, 110 (2003) (skeptical that two dimensions are adequate); Paul H. Edelman & Jim Chen, *The Most Dangerous Justice Rides into the Sunset,* 24 Const. Comm. 299, 300 (2007) ("The presence of unpredictable voting coalitions suggests that Supreme Court Justices' decisions may in some cases be structured along divergent or cross-cutting issue dimensions."); Harry T. Edwards & Michael A. Livermore, *Pitfalls of Empirical Studies that Attempt to Understand the Factors Affecting Appellate Decisionmaking,* 58 Duke L.J. 1895, 1916 (2009) (objecting to the idea that "an individual judge's personal views" fit on a "left-right axis"); Joshua B. Fischman, *Do the Justices Vote Like Policy Makers? Evidence from Scaling the Supreme Court with Interest Groups,* 44 J. Legal Stud. S269 (2015) (finding a "robust two-dimensional voting structure" on the Roberts Court in criminal cases); Joshua B. Fischman & David S. Law, *What Is Judicial Ideology, and How Should We Measure It?,* 29 Wash. U. J.L. & Pol'y 133, 150–54 (2009) (criticizing the idea that judicial ideology has a single dimension); Benjamin E. Lauderdale & Tom S. Clark, *The Supreme Court's Many Median Justices,* 106 Am. Pol. Sci. Rev. 847 (2012) (finding different orderings of the justices in different issue areas, each on a single dimension); Michael Peress, *Small Chamber Ideal Point Estimation,* 17 Pol. Analysis 276, 285–86 (2009) (estimating the ideological locations of Supreme Court justices in two dimensions); Carolyn Shapiro, *Coding Complexity: Bringing Law to the Empirical*

Analysis of the Supreme Court, 60 Hastings L.J. 477, 501–02 (2009) (claiming that the scoring conventions of the Supreme Court Database produce the one-dimensional sorting); Lawrence Sirovich, *A Pattern Analysis of the Second Rehnquist U.S. Supreme Court,* 100 Proc. Nat'l Acad. Sci. 7432 (2003).

[18] Fischman, *supra* note 14.

[19] *See* Glendon Schubert, The Judicial Mind Revisited: Psychometric Analysis of Supreme Court Ideology (1974).

[20] However, as we discuss in note 28 and accompanying text and also at the end of the appendix, median voter models of judicial voting imply a constant absolute number of coalitions whereas the index is sensitive to the proportional usage of coalitions. Since the potential coalitions increase exponentially with court size, median voter judging would correspond to lower index values for larger courts. The data are not consistent with simplistic median voter judging, as the appendix explains, because pairs of majorities separated by a single swing vote, while existing, do not explain the bulk of the data.

[21] *See, e.g.,* Elliott Ash & W. Bentley McLeod, *The Performance of Elected Officials: Evidence from State Supreme Courts,* NBER Working Paper 22071 (2016) (merit selection produces judges who tend to be cited more); Stephen J. Choi, G. Mitu Gulati & Eric A. Posner, *Professionals or Politicians: The Uncertain Empirical Case for an Elected Rather than Appointed Judiciary*, 26 J.L. Econ. & Org. 290 (2010) (not determinative but partisan selection produces judges who have slightly lower quality metrics); *See also* Nicholas L. Georgakopoulos, *Judicial Reaction to Change: The California Supreme Court around the 1986 Elections,* 13 Cornell J.L. Pub. Policy 405 (2004) (the voting patterns of California Supreme Court Justices surrounding the Rose Bird removal elections).

[22] In sizable courts, frequently the court will not issue enough tightly split opinions for those to possibly be issued by every possible coalition. The court's composition changes and the number of tightly split opinions is smaller than the number of possible coalitions. This happens routinely in the United States Supreme Court where the number of possible coalitions are 126 (see Appendix, Parts A-C, explaining the math of the index) but the court has never issued more than about 30 tightly split opinions per year (see table 4 and figure 1). Rarely will it be the case that the court will issue a number of tightly split opinions under the same junior justice close to 126 or a multiple of it. Despite that values of the index very near 1 are mathematically impossible even if the court was issuing its decisions proportionately from all possible coalitions, this theoretical impossibility is not a limiting factor because the court's opinions are very far from being issued proportionately by every possible coalition. As the examples will show, the tightly split opinions arise disproportionately from a handful of coalitions.

[23] Indeed, as is discussed in greater detail in the appendix, this is the critical advantage of the quadratic index that we propose over a simpler linear index, which would disregard the composition of the coalitions.

[24] For example, if the single swing vote is of Justice One, the first coalition could have One, Two, Three, Four, and Five as the majority. The second coalition is formed when One switches to the prior minority to form the majority One, Six, Seven, Eight, Nine. If instead of One, the votes that swing are those of Four, Five, Six, and Seven, the second majority is One, Two, Three, Six, and Seven. If each coalition issues the same number of opinions and no other opinions exist, then the index produces the values .119659 and .338562, rounded to two decimal digits in the text.

[25] The time over which to measure the frequency of tightly split opinions is not clear. Because the court does not sit throughout the year and it tends to issue a disproportionate number of opinions on the last days of each term, both a calendar duration (i.e., from date of appointment of the junior justice to the date of the successor's appointment or the earlier end of the junior justice's term) and an opinion span duration (i.e., from the date of the first tightly split opinion to the date of the last one; what we use in this table) are imperfect. We use opinion span duration because it produces smoother results but report the major differences that a switch to calendar duration would produce, see note 41, below.

[26] As explained in the appendix, in equation (6), the number *m* of possible coalitions for tightly split opinions in a court with an odd number of judges *j* is *j* factorial divided by the product of the factorials of the integers adjacent to half *j*. Using this formula, a five-member court has a maximum of 10 coalitions; a seven-member court has 35; and a nine-member one has 126.

[27] Without accounting for the different number of swing votes in the various coalitions, a nine-member court issuing 126 opinions can do so in almost three-and-a-half-million ways. See discussion accompanying figure 3 in the appendix.

[28] Adjacent, here, means not farther than the next justice to the median or swing justice, next on either the liberal side (i.e., the most conservative of the liberal block) or on the conservative side (i.e., the most liberal of the conservative block). If a dispute arose beyond either, then it would no longer produce a tightly split opinion, since it would attract both the vote of median justice and the next one. For example, in a five-member court the pivot points, in a scale from 0 to 1, where each justice changes their vote from liberal to conservative may be .1, .2, .5, .6, .7. Only disputes with characteristics from .2 to .6 produce tightly split opinions. The disputes from .2 to .5 produce a majority of the last three justices. Those from .5 to .6 produce the majority of the first three justices. A five-member court using two coalitions proportionately produces an index of .24 whereas a nine-member court produces an index of .12. A fuller discussion of examples of simple median voter judging is at the end of the appendix.

[29] For example, the court's single opinion in *Baltimore & Ohio R. Co. v. United States*, 386 U.S. 372 (1967) disposed of several identical disputes arising from objections by railroads against the approval of a merger by the Interstate Commerce Commission.

[30] Both Justice Powell and Justice Rehnquist were ▸

appointed on July 1, 1972. Therefore, for the purpose of applying the index they are both the most junior members of the court, defining its composition until the appointment of Justice Stevens on Dec. 19, 1975.

[31] *Boyd v. Dutton*, 405 U.S. 1 (1972).

[32] *Ludwig v. Mass.,* 427 U.S. 618 (1976).

[33] *See* note 26.

[34] The linear index we initially tested produces a value of 7.19 percent, which is smaller and insufficiently distinguishable from that of the Breyer court, 7.23 percent, showing the inadequacy of the linear index. *See also* Nicholas L. Georgakopoulos, Frank Sullivan, Jr., and Dimitri Georgakopoulos, *An Index of Fluidity of Judicial Coalitions,* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2685474.

[35] *Hess v. Port Auth. Trans-Hudson Corp.*, 513 U.S. 30 (1994).

[36] *McCreary Cty., Ky. v. Am. Civil Liberties Union of Ky.*, 545 U.S. 844 (2005).

[37] This suggests that the Breyer court's fluidity should be smaller than that of the Powell court. However, our initial linear index did not differentiate the two courts, *see* note 24. The Breyer court's linear index of judicial coalition fluidity (7.23 percent) is virtually identical to, and even greater than, the one that the Powell-Rehnquist court produces (7.19 percent). This seems contrary to the desirable function of the index, because the Breyer period had less fluid coalitions.

[38] The data was compiled from Table D of the annual *Examination of the Indiana Supreme Court Docket, Dispositions, and Voting, c*ompiled under the

direction of Kevin W. Betz (1999-2004) and Mark J. Crandley (2005-2010) and assisted by P. Jason Stephenson and other authors, and published by the Indiana Law Review in vols. 33–44 (2000-2011), respectively.

[39] *Allen v. State*, 720 N.E.2d 707 (Ind. 1999).

[40] *In. Dep't of State Revenue v. Belterra Resort Indiana, LLC,* 935 N.E.2d 174 (Ind. 2010).

[41] Switching to calendar duration would reduce the frequency of tightly split opinions by the Blackmun and Scalia courts to 1.6 and 2.5 but dramatically increase that of Goldberg to 7.4. *See also* note 25, above.

[42] A significant number of opinions are necessary for the court to have the opportunity of recognizing a value of the index within a range with reasonable variation. Calculating the index based on a single opinion would always produce an index of zero. While 126 opinions from the 126 possible different coalitions possible in a nine-member court would be necessary to reach an index of 1, we feel that the cutoff of 30 may be reasonable given the absence of a tendency to approach large index values that we see even in the large samples of the Powell-Rehnquist court and, especially, the Breyer court. Thirty opinions are sufficient for a nine-member court, for example, to produce a fluidity index of .83. Starting from the baseline majority of justices One, Two, Three, Four, and Five, the court needs to produce an opinion from each of 29 majorities resulting from four swing votes, such as the majority of Three, Four, Five, Six, and Seven, which results from the swings of One, Two, Six, and Seven from the baseline coalition.

[43] The resulting gaps correspond to Clark, the

junior justice before Minton, with no tightly split opinions; to Warren, Harlan, and Brennan, the junior justices before Whittaker, with 9, 18, and 6 opinions; to White, the one before Goldberg, with zero; to Marshall and Burger, the ones before Blackmun, with 12 and four; to Souter, the one before Thomas, with 22; to Ginsburg, the one before Breyer, with 13; to Roberts, the one before Alito, with two; to Sotomayor, the one before Kagan, with 17.

[44] Bob Woodward & Scott Armstrong, The Brethren 10 (1979); Stanley I. Kutler, *Richard Nixon, in* Oxford Companion to the Supreme Court of the United States 687 (2d ed. 2005); Gary L. McDowell, *Ronald Reagan, in* Oxford Companion to the Supreme Court of the United States 825–26 (2d ed. 2005).

[45] *See, e.g.,* Jeffrey A. Segal, Richard J. Timpone & Robert M. Howard, *Buyer Beware? Presidential Success through Supreme Court Appointments,* 53 Pol. Res. Q. 557–73 (Sep. 2000) ("Presidents appear to be reasonably successful in their appointments in the short run, but justices on average appear to deviate over time …").

[46] *See, e.g.,* Rush Limbaugh, *I'm Scared and Angry About the Obamacare Ruling,* The Rush Limbaugh Show (July 2, 2009), http://www.rushlimbaugh.com/daily/2012/07/02/i_m_scared_and_angry_about_the_obamacare_ruling.

[47] Ind. Const. Art. 7, § 9 and I.C. § 33-27-2 et seq. Once appointed, justices must stand for periodic retention votes but no material opposition has ever been mounted.

[48] Ind. Const. Art. 7, § 10.