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The Fluidity of Judicial Coalitions in the Supreme Courts of the United States and Indiana

APPENDIX: THE INDEX OF FLUIDITY OF COALITIONS

A. Table of Justice Agreement and Its Average

We initially developed a linear index. The application of the linear index revealed an important drawback. Consider two separate time periods in which the court’s membership differed but during each of which the membership did not change, i.e., separate time periods marking the tenures of two different Junior Justices. Suppose that court issued sporadic 5–4 opinions from several coalitions but that three coalitions were much more prolific in both periods. In one period, the three prolific coalitions would have very similar composition, one with a defined set of dissenters and the other two having those dissenters in the majority with one of two swing votes. In the other period, the three prolific coalitions have compositions that differ more. The linear index would produce almost the same

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Spreadsheets with our data and analysis exist in www.nicholasgeorgakopoulos.org, under scholarship, in the paragraph corresponding to this article.

49. The linear index treats as the extremes (a) the issuance of opinions proportionately from every possible coalition and (b) the issuance of all opinions from a single coalition. The linear index reflects the actual dispersion of coalitions issuing opinions in that range. Two courts that used equally only three coalitions to issue all opinions would produce the same value of the linear index regardless of the composition of the three coalitions. Thus, the linear index ignores how different those coalitions are, whereas the index that we propose does account for such differences.

50. As revealed in the main text, subsection III.B, this is the case of the Breyer court, where the most prolific coalition has the liberal justices in the minority and the next two coalitions are the same justices in the majority, joined by either Justice Kennedy or Justice O’Connor.
value for these two courts but we feel that the second period exhibits greater fluidity. This problem is resolved by our junior co-author’s creation of a quadratic index of fluidity, which rests on a comparison table already used to study the voting of judges, what SCOTUSblog calls the table of Justice agreement.\textsuperscript{51} Each Justice corresponds to a row and a column and each intersecting cell holds the percentage of the opinions in which the intersecting Justices vote together.

Compare, however, the actual table of Justice agreement to what would exist in a court with zero fluidity, where the voting coalitions in every tightly split opinion are exactly the same. In a five-member court, a single 3–2 alignment would issue all opinions. Suppose the Justices have names One through Five. Justices One, Two, and Three always vote together in the majority, and Justices Four and Five always dissent together. The resulting table would have ones (100\%) in the extremes and zeros in a two by three region on the top right, as illustrated in table 5.

<table>
<thead>
<tr>
<th></th>
<th>One, J.</th>
<th>Two, J.</th>
<th>Three, J.</th>
<th>Four, J.</th>
<th>Five, J.</th>
</tr>
</thead>
<tbody>
<tr>
<td>One, J.</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Two, J.</td>
<td></td>
<td>-</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Three, J.</td>
<td></td>
<td></td>
<td>-</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Four, J.</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Five, J.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-</td>
</tr>
</tbody>
</table>

Table 5: The table of Justice agreement in the case of extreme disagreement in 3–2 decisions of a five-member court.

Notice that in table 5 the zeros form a region of two columns by three rows. By repositioning the separate areas of ones, i.e., by moving the fourth row of the fifth column to the second row of the second column, observe that the ones form a region of two columns by two rows. The pattern holds for larger courts with an odd number of justices. That is, after such repositioning, the table of extreme disagreement for a court with an odd number of \(j\) members will have zeros in a region of \((j - 1) / 2\) columns by \((j + 1) / 2\) rows and ones in a square region with sides \((j - 1) / 2\). The result is the average rate of agreement, the average cell value \(a\), which simplifies to

\[
a = \frac{j - 1}{2j}. \quad (1)
\]

Notice that this is also the value of each cell in the case of a
court with utterly fluid coalitions, since each justice will have agreed
on average with every other member of the court, \((j - 1) / j\), in every
two opinions (divide by 2). The corresponding values of the average
cell value \(a\) for 5-, 7-, and 9-member courts are .4, .4286, and .4444.

B. The Maximum Square Root of Averaged Squared Differences

Return to the table of justice agreement in the case of extreme
disagreement. For each cell in the table, calculate the difference of its
value from the average rate of agreement \(a\). Square those differences.
Take the average of the squared differences and obtain the square
root of this average. That is the maximum that the root of the average
of squared differences can reach, call it \(r\).

To calculate \(r\) we start from the fact that we know that the
number of cells containing ones is \(\left[ \frac{(j - 1)}{2} \right]^2\). Therefore this must
be multiplied by \((1 - a)^2\). We know the number of cells containing
zeros is \(\left[ \frac{(j - 1)}{2} \right] \left[ \frac{(j + 1)}{2} \right]\). That must be multiplied by
\((0 - a)^2\). The sum of the two forms the numerator, the maximum
sum of squares. Divide by the number of cells, \(j(\frac{j - 1)}{2}\), computed
according to the explanation to equation 3, below. The square root of
that fraction is the root of the maximum sum of squares \(r\), which after
substituting \(a\) from equation (1) simplifies to

\[
\sqrt{\frac{(j + 1)(j - 1)}{2j}}.
\]  

The corresponding values of the root of the maximum sum of
squared differences \(r\) for 5-, 7-, and 9-member courts are .4898,
.4948, and .4969. Since these values indicate the least fluid coalitions
that a court can possibly have, the index should have a value of zero
in those cases.

C. Index of Fluidity of Judicial Coalitions

We then take the root \(s\) of the average of the squared differen-
tces of the actual table of justice agreement and express it as a fraction
of the maximum, \(r\), and subtract it from one to find the index of
fluidity of judicial coalitions. This index takes a value of zero for
courts that only have a single coalition for all their tightly split
opinions and, therefore, have zero fluidity. The index takes a value
of one for courts where the members agree proportionately with every other member in all their tightly split opinions.\textsuperscript{52}

More formally, the calculation of the quadratic index of fluidity of judicial coalitions has the following steps:

1. Form the table of Justice agreement, a table where each cell \( k \) holds the fraction \( g_k \) of tightly split opinions when two justices agree. To observe the simplification of the number of cells in the table of justice agreement do a simple transposition. Transpose the single cell of the last row to the blank cell at the first column of the first row. Continue by transposing the penultimate row (which has two cells, immediately below, filling out the second row. Continue until the triangular shape of the table of justice agreement becomes a rectangle. The rectangle has width of \( j \) columns and height \((j - 1)/2 \) rows. Accordingly, the number \( q \) of cells of the table of Justice agreement is

\[
q = j (j - 1)/2
\]  

\text{(3)}

The number of cells \( q \) of the table of Justice agreement for 5-, 7-, and 9-member courts is 10, 21, and 36.

2. For each cell \( k \) of the table of justice agreement calculate the squared difference from \( a \), the average rate of agreement, known from equation (1), \( a = (j - 1)/2 \).

3. Take the square root \( s \) of the average of the squared differences, i.e.,

\[
s = \sqrt{\frac{\sum_{k=1}^{q} (g_k - a)^2}{q}}
\]  

\text{(4)}

The division by \( q \) facilitates the textual exposition by letting us refer to \( s \) as the square root of the average squared differences (instead of their sum) but plays no role. It cancels out in the ratio with \( r \). As recognizing that \( s \) and the \( s/r \) ratio are Euclidian distances is important, and Euclidian distance does not include this division, we will disregard it when explaining that understanding of the index.

4. Take the ratio of the root of averaged squared differences \( s \) to its maximum \( r \) as calculated in equation (2) and subtract it from one to obtain the quadratic index of fluidity of judicial coalitions \( f \):

\[
f = 1 - \frac{s}{r}
\]

Worth noting is the fact that the quadratic index would not work if we were not limiting our focus to tightly split opinions, such as 5–4 opinions in 9-member courts. Only tightly split courts produce results comparable to the maximum root of average squared disagreement rates \( r \). A unanimous court, for example, would have ones in every cell and produce a value greater than this maximum.

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In geometrical terms, we calculate Euclidian distances. The number of cells $q$ in the table of justice agreement, establish a $q$-dimensional space, illustrated simplified as 3-dimensional in figure 2. If coalition usage is exactly proportional, perfectly fluid, the court is in the Cartesian position $(a_1, a_2, \ldots a_q)$ in that space, where all $a_i = a$. The court’s actual usage of coalitions places it at point $(g_1, g_2, \ldots, g_q)$.

The Euclidian distance of the court’s actual usage of coalitions from the point of proportional usage, is $s = [(a_1-g_1)^2 + \ldots + (a_q-g_q)^2]^{1/2}$ (ignoring the immaterial division by $q$). The value $r$ is the distance of proportional usage of coalitions to any of the (corner) extremes of utter lack of fluidity. Our index compares the court’s actual distance from proportional usage of coalitions in that space to the distance from the extremes of utter lack of fluidity.

Figure 2: Illustration of the Euclidian distances of the index in three dimensions.

The use of this index of fluidity of judicial coalitions needs defense against the claim that a simpler, linear index would be
adequate. The most compelling rejection of the linear index came from our discussion of the application of the index to the Breyer court and the Powell-Rehnquist court. A more complete discussion of the linear index and a comparison clarifies, however. The appendix closes with some examples that show how the index applies to courts of different sizes especially in juxtaposition with median voter models of judicial voting.

D. Comparison to the Linear Index

The computation of the linear index is simpler because it does not involve the creation of the table of justice agreement. One merely has to count the number of opinions issued by each coalition. Sort those numbers in diminishing order. Weigh each by the appropriate coefficient and sum to obtain the linear index.

The process for obtaining the linear index \( f_L \) of the fluidity of judicial coalitions of a court with an odd number of judges \( j \) from a sample of \( n \) split decisions comes from the following steps:

1. Count the number of decisions that each coalition produces. Call \( c_0 \) the number of decisions that the coalition that produces the greatest number of decisions produces. Call \( c_1 \) the number of decisions that the next most productive coalition produces; \( c_2 \) the number that the third most productive coalition produces, and so on.

2. Calculate the possible number of majority coalitions, the number \( m \) of coalitions that a court with an odd number \( j \) of judges can form. The derivation of the formula starts with the factorial, which gives the number of ways a group can be placed in order. For simplicity, consider a 5-member court. For a group of 5 (or \( j \)), five (or \( j \)) elements can take the first position, four the second, and so on, so that the product \( 5 \times 4 \times 3 \times 2 \times 1 \) (or \( j! \)) gives the number of ways five elements can be ordered. Since for tightly split opinions we are only dealing with coalitions of 3 members, we divide by \( 2! \) (or \( (j - 1)/2)! \) to eliminate groups of length four and five. The result is the number of ways three members of a group of five can be ordered. Because order does not matter in coalitions, we also divide that result by the number of ways a group of three (or \( (j + 1)/2 \)) can be ordered, 3 factorial or \( 3 \times 2 \times 1 \):

\[
m = \frac{j!}{\left(\frac{j+1}{2}\right)! \left(\frac{j-1}{2}\right)!} \quad \text{(6)}
\]
3. Calculate the linear index $f_L$ of fluidity of judicial coalitions

$$f_L = \sum_{i=1}^{m-1} \frac{2c_i i}{(m-1)n}.$$  \hspace{1cm} (7)

In other words, put the number of split decisions that each coalition produces in decreasing order, count the second and smaller groups and sum the ratios of the product of (a) the number of decisions in each group $c_i$ and (b) twice the order $i$ of that group; divided by the product of (a) $m - 1$, one less than the number of possible majority coalitions $m$, and (b) the total number of decisions $n$.

The relation of the quadratic index to the linear index reveals the additional detail that the quadratic index produces. Begin by considering all the possible ways that a court can form coalitions, $m$. The extreme of fluidity would have the same number of opinions coming from each coalition. Suppose each coalition produces one opinion. Consider all the ways that this number of total opinions can be produced, from most concentrated, i.e., all opinions coming from a single coalition, to this most fluid production of one opinion from each coalition.

Using the example of a 5-member court, the possible number of coalitions $m$ is 10. The extreme of fluidity is one opinion from each of the ten possible coalitions. The opposite extreme is that of a single coalition producing all ten opinions. Table 6 offers the (abbreviated) list of the possible coalition usage combinations with which a 5-member court can produce 10 opinions. The listing begins with the most concentrated extreme of all 10 opinions coming from a single coalition. The next row corresponds to 9 opinions coming from one coalition and 1 opinion coming from a second coalition. The opposite extreme of utter fluidity is at the last row, where each coalition issues one opinion.

Each row of table 6 consists of a particular usage of coalitions by a 5-member court that issues ten opinions. All opinions may come from a single coalition, as in row 1. Row 7 corresponds to the idea that one coalition produces 7 opinions, and three different coalitions produce one opinion each. The last row corresponds to the most fluid

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53. The range of possibilities arises from the mathematical process of partitioning ten into its integer components. In this sense, table 6 offers the (abbreviated) list of partitions of ten.
usage of coalitions, with one of each of the ten possible coalitions producing one opinion. The unabridged table has 42 rows.

The last two columns of the table hold the corresponding index values. The penultimate column has the value of the linear index that corresponds to each row, $f_L$. The last column has the range of values that the (quadratic) index $f$ can take.

<table>
<thead>
<tr>
<th>Possible Coalitions for 10 Opinions</th>
<th>$f_L$</th>
<th>Range of $f$</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>9 1</td>
<td>.02</td>
<td>.08–.12</td>
</tr>
<tr>
<td>8 2</td>
<td>.04</td>
<td>.14–.23</td>
</tr>
<tr>
<td>8 1 1</td>
<td>.07</td>
<td>.16–.24</td>
</tr>
<tr>
<td>7 3</td>
<td>.07</td>
<td>.19–.31</td>
</tr>
<tr>
<td>7 2 1</td>
<td>.09</td>
<td>.23–.35</td>
</tr>
<tr>
<td>7 1 1 1</td>
<td>.13</td>
<td>.24–.36</td>
</tr>
<tr>
<td>6 4</td>
<td>.09</td>
<td>.23–.37</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 2 2 2 1 1</td>
<td>.46</td>
<td>.67–.80</td>
</tr>
<tr>
<td>2 2 2 1 1 1 1</td>
<td>.53</td>
<td>.73–.82</td>
</tr>
<tr>
<td>2 2 1 1 1 1 1 1</td>
<td>.64</td>
<td>.80–.84</td>
</tr>
<tr>
<td>2 1 1 1 1 1 1 1 1</td>
<td>.8</td>
<td>.84–.87</td>
</tr>
<tr>
<td>1 1 1 1 1 1 1 1 1 1</td>
<td>1.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 6: Coalition usage by a seven-member court issuing 10 opinions and index values.

Whereas each row of table 6 corresponds to a single value of the linear index, it may correspond to several values of the quadratic index, depending on how many swing votes can exist in the composition of different coalitions. For example, the second row of the table indicates the formation of two 3–2 voting coalitions in a 5-member court, the first issuing 9 opinions and the second issuing 1. The linear index, because it does not involve the detail of composition of coalitions, produces the same value regardless which justices form the second majority. However, the second majority can arise from either a single swing vote or two swing votes. Two majorities can arise from a single swing vote if, say, from the majority of Justices One, Two, and Three, we have Justice One join Four and Five to form the second majority of One, Four, and Five. Two majorities can also arise from two swing votes if, say, from the same first majority, Justices One and Four change their votes to form the second majority of Two, Three, and Four (with One and Five in the minority). The quadratic index produces different values because the
composition of the coalitions changes more in the second case than in the first.

![Figure 3: Five-member court, quadratic (y) to linear (x) fluidity index correspondence.](image)

Figure 3 illustrates the correspondence of the quadratic index to the linear index. The dashing line is merely the diagonal, to help the reading of the graph. Each point corresponds to a coalition usage. The horizontal (or x-) coordinate of the points corresponds to linear values of the index. The vertical (or y-) coordinate corresponds to quadratic values of the index. The phenomenon that multiple values of the quadratic index correspond to one value of the linear index appear by connecting the values that arise from different coalitions that fit on the same row of table 6 with a line. Only in the extremes of values of 0 or 1 does the value of the linear index correspond to only a single value of the quadratic index. All intermediate forms of coalition usage (i.e., all rows of table 6 other than the first and the last) can give rise to several quadratic index values corresponding to one value of the linear index. Accordingly, the figure has 46 vertical

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54. An interactive version of this figure, with popups showing the underlying coalitions, exists in www.nicholasgeorgakopoulos.org, under scholarship, in the paragraph corresponding to this article.
lines, as many as are the other rows of table 6. However, because some rows share a value of the linear index, as do rows 4 and 5, or rows 6 and 8, the figure has some lines overlap.

The attempt to observe such detail in larger courts stumbles on complexity. A 7-member court has 35 possible coalitions \((m=35)\). The corresponding table 6 for a 7-member court, i.e., the possible ways that its coalitions can produce 35 opinions, has 14,883 rows. The graph corresponding to figure 3 for a 7-member court would have that many vertical lines (no overlapping lines in that case). A 9-member court has \(m=126\) possible coalitions and would produce 3,457,027 rows, forcing the postponement of its further analysis to an era of significantly greater computing power.

**E. The Index and Median Voter Models of Judging**

As discussed in the main text, note 28 and accompanying text, median voter models of judging with a small number of dimensions are in some tension with the index. Median voter models would lead to a small and fixed number of coalitions, actually two coalitions per dimension in the model. A model where only a political left-to-right dimension determines judicial voting would produce only two tightly split coalitions. This would hold for all court sizes. Regardless of the size of the court, when justices align from left to right, the median justice separates the left-voting block from the right-voting block and tightly split opinions only come from either block plus the median justice. Adding a second dimension to the median voter model changes the number of voting blocks and, perhaps, the number of justices that are the swing votes. Thus, if the first dimension is from social liberalism to conservatism and the second dimension from economic liberalism (“laissez-faireism”) to economic interventionism, the court’s tightly split opinions will likely reveal four groupings of judges. The median justice from the perspective of social liberalism will separate the block of social liberals from conservatives and the median laissez-faireist judge will separate the laissez-faireist block from the interventionist block. The same pattern holds for additional dimensions. In each dimension, the median judge separates that dimension’s voting blocks.

Returning to the one-dimensional model, as the court adjudicates disputes, the justices ascertain the amount of conservatism on which the dispute turns and vote accordingly. If the conservatism value of the dispute produces a unanimous opinion or any split that does not produce a tightly split opinion, then that opinion is
irrelevant to the index. However, if the conservatism value of the dispute is such that the conservative block cannot attract the vote of the median justice, then a tightly split opinion will arise, with the liberal block plus the median justice in the majority and the conservative block in the minority. The median justice will see disputes with slightly smaller conservatism values as justifying a vote switch, whereas no justice of the liberal block would change yet their vote. The result will be some tightly split opinions where the majority is the conservative block plus the median justice and the minority is the liberal block.

If the division from liberalism to conservatism explains all of judicial voting, then these two coalitions would issue all tightly split opinions. The size of the court would not matter. Courts of any size would always issue all their tightly split opinions from only two coalitions. In a five-member court, the liberal and the conservative blocks would each hold two judges. In a 7-member court they would each hold three judges. In a 9-member court they would each hold four judges. By design, the median voter model produces only two coalitions for tightly split opinions regardless of court size.

<table>
<thead>
<tr>
<th>Median Voter Model Scenario</th>
<th>5-j Ct</th>
<th>7-j Ct</th>
<th>9-j Ct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single dimension, one swing vote</td>
<td>.24</td>
<td>.16</td>
<td>.12</td>
</tr>
<tr>
<td>Single dimension, two swing votes</td>
<td>.39</td>
<td>.28</td>
<td>.22</td>
</tr>
<tr>
<td>Single dimension, three swing votes</td>
<td>–</td>
<td>.35</td>
<td>.30</td>
</tr>
<tr>
<td>Single dimension, four swing votes</td>
<td>–</td>
<td>–</td>
<td>.34</td>
</tr>
<tr>
<td>Two dimensions</td>
<td>.53</td>
<td>.45</td>
<td>.42</td>
</tr>
<tr>
<td>Two dimensions, one steady block, n. 55</td>
<td>.34</td>
<td>.23</td>
<td>.17</td>
</tr>
<tr>
<td>Two dimensions, single swing vote, n. 56</td>
<td>.59</td>
<td>.43</td>
<td>.43</td>
</tr>
<tr>
<td>Same with less variation in 9-ct blocks, n. 57</td>
<td>.59</td>
<td>.43</td>
<td>.43</td>
</tr>
<tr>
<td>Three dimensions, full variation, n. 58</td>
<td>.69</td>
<td>.51</td>
<td>.48</td>
</tr>
<tr>
<td>Same with extra var’n for 9-ct, n. 59</td>
<td>.69</td>
<td>.51</td>
<td>.48</td>
</tr>
</tbody>
</table>

Table 7: Index values for some median voter models.

Because the index, however, also depends on available but unused coalitions, a 5-member court experiencing two coalitions with a single swing vote will have a greater index of fluidity than larger courts. A 5-member court will have an index of fluidity of .24, a 7-member court one of .16, and a 9-member court would have an index of .12 if both coalitions issued the same number of opinions. The proportion of opinions from the two coalitions will depend on the distribution of disputes and on the location of the justices adjacent
to the median justice in each dimension. Table 7 presents a summary of the models discussed here.

The low value of the index is a result of the median voter model which implies a single swing vote. More swing votes would produce a higher index of fluidity. For example, start with a 9-member court and the coalition of 1, 2, 3, 4 and 5 as the base for comparison. A single swing vote may be the swing of 1 into the erstwhile minority to form the majority of 1, 6, 7, 8, and 9. A court using only those two coalitions proportionately would produce an index value of .12 (.16 for a 7-member court; .24 for a 5-member one). However, the court could experience two swing votes. For example, 1 can vote with the minority but 6 can also swing to vote for the majority, forming the new majority coalition of 6, 2, 3, 4, and 5. Now, the index value becomes .22 (.28 for a 7-member court; .39 for a 5-member one). If the court experienced a third swing vote, a swing of 2 to the other side, the resulting majority would be 1, 2, 7, 8, and 9, giving an index value of .3 (.35 for a 7-member court; again .39 for a 5-member one). A fourth swing vote, for example of 7 to join the initial majority, would produce the majority of 6, 7, 3, 4, and 5. This would correspond to an index value of .34, more than double the value of the index for a 7-member court with a single swing vote, which we saw is .16. In all the above examples, the court is issuing an equal number of opinions from both coalitions and no other opinions.

Proceed again to a simple model of two dimensions, e.g., one from social liberalism to conservatism and one from economic laissez-faireism to interventionism. A median voter model would again assume that judges change their votes as the conservativeness and interventionism of a dispute passes each justice’s threshold. Notably absent from such a simplistic model is either a relation between those dimensions and a capacity of justices to compromise between their values. Disputes are only adjudicated on one of the two dimensions, essentially. The result is that every court has two voting blocks and a median justice for each dimension.

Start by trying to have the 5-member court reach the most variation. A liberal voting block and a conservative block arise, divided by a median conservative justice. A liberal and a conservative justice can form the laissez-faireist block. If the interventionist block takes the remaining liberal justice then the median interventionist justice must be the remaining conservative justice, leaving the median conservative justice as the other member
of the interventionist block. (The same amount of variation would also result from the interventionist block having the median conservative justice and the remaining member of the conservative block, leaving the remaining member of the liberal block to take the role of the median interventionist justice.) Place in the liberal block justices One and Two. Justice Three is the median conservative justice. The conservative block are justices Four and Five. The laissez-faireist block are justices One and Four. The interventionist block are justices Two and Three, leaving Five as the swing vote on interventionism. A 5-member court that uses these four coalitions equally produces an index of .53.

A 7-member court can have One, Two, and Three as the liberal block, and Five, Six, and Seven as the conservative block with Four as the median conservative justice. The laissez-faireist block can be One, Two, and Five. The interventionist block can be Three, Four, and Six, leaving Seven as the median interventionist justice. A 7-member court that uses these four coalitions equally produces and index of .45.

A 9-member court can have One, Two, Three, and Four as the liberal block; Six, Seven, Eight, and Nine as the conservative block leaving Three as the median-conservative justice. The laissez-faireist block can be One, Two, Six, and Seven. The interventionist block can be Three, Four, Five, and Eight, with being the median-interventionist justice. A 9-member court that produces opinions equally from these four coalitions has an index of .42.

The above transition from .53 to .45 and .42 as court size increases in the two dimensional median voter model assumes full variation in the roles. To observe a reduction in variation, consider that the justices comprising the conservative block are also the ones comprising the laissez-faireist block.55 One of the liberal block is the median justice for the laissez-faireism to interventionist dimension. Then the three courts produce values of .34, .23, and .17. The reduced variation has a greater impact on the index for a larger court because it binds four justices who could have formed coalitions many different ways and could have produced much more variation.

55. The conservative and laissez-faireist justices are, in the 5-member court, 4 and 5; in the 7-member court 5, 6 and 7; in the 9-member court, 6, 7, 8, and 9. In all courts the swing vote in conservatism is 1 and the swing vote in interventionism is 2. The resulting majorities are 1, 2, 3 (liberal); 1, 4, 5 (conservative); 1, 2, 3 (interventionist) and 2, 4, 5 (laissez-faireist) in the 5-member court; 1, 2, 3, 4 (liberal); 1, 5, 6, 7 (conservative); 1, 2, 3, 4 (interventionist); and 2, 5, 6, 7 (laissez-faireist) in the 7-member court; and 1, 2, 3, 4, 5 (liberal); 1, 6, 7, 8, 9 (conservative); 1, 2, 3, 4, 5 (interventionist); and 2, 6, 7, 8, 9 (laissez-faireist) in the 9-member court. Each issues the same number of opinions.
A different reduction in variation would be to let the swing vote be the same in both directions, maintaining the different composition of the voting blocks.\textsuperscript{56} The three courts produce values of .59, .43, and .43. But the 9-member court can experience a further slight reduction in variation. The voting block for the second dimension can have two justices from each block in the first dimension. Variation drops if each voting block for the second dimension takes three justices from one block of the first dimension.\textsuperscript{57} Then its index drops to .34.

Finally, the median voter model can have three dimensions. The full variation that the courts of different sizes could experience would produce index values of .69, .51, and .48.\textsuperscript{58} However, the 9-member court could produce additional variation within the limitations of the median voter model.\textsuperscript{59} The result would be an index of .53, greater than that of the 7-member court.

Table 7 presents these correspondences of the index to median voter models. The left column describes the model. The remaining three columns present the corresponding value of the index. The values for a 5-member court are in the column headed 5-j Ct. The columns headed 7-j Ct and 9-j Ct have the index for 7- and 9-member courts. We contend that the variations of coalitions and the index values we present suggest a much thicker explanation for judicial coalition formation than simple median voter models give.

Reconciling the median voter models with the conduct of the actual courts is not yet feasible. The fundamental contradiction
between median voter models and actual court behavior stems from the fact that we do not observe the single-swing-vote coalitions that median voter models lead us to expect. For example, in the Powell-Rehnquist court, we saw that two of the most prolific majority coalitions on the United States Supreme Court differed by two swing votes. The top coalition, with about 34% of all the five-four opinions was Blackmun, Burger, Powell, Rehnquist, and White in the majority and Brennan, Douglas, Marshall, and Stewart in dissent. While the third most prolific coalition arises from the swing vote of Stewart, the other most prolific coalitions do not conform to a median voter model, separable by a single swing vote from an other prolific coalition. The second most prolific coalition, with about 16.5%, was Blackmun, Burger, Powell, Rehnquist, and Stewart in the majority, and Brennan, Douglas, Marshall, and White in the dissent. The fourth, with 4.6%, has Blackmun, Brennan, Burger, Rehnquist, and White in the majority and Douglas, Marshall, Powell, and Stewart in dissent. While two coalitions that conform to the predictions of a median voter model do exist, the other coalitions are not easily explained.

If a simple median voter model applied, then it would be quite unlikely that neither of these coalitions has an opposite coalition that stems from a single swing vote that has a significant number of opinions. Rather, these double swing coalitions along with the existence of numerous coalitions that only issue one tightly split opinion could be interpreted to defy median voter models, or at least median voter models with a small number of dimensions. Perhaps, or even likely, justices balance the various aspects (or dimensions) of each dispute in ways that are not generalizable or at least not yet subject to analysis akin to that of simple median voter models.