Case Western Reserve Law Review

Volume 62 | Issue 4 Article 7

2012

# Population Equality and the Imposition of Risk on Partisan Gerrymandering

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# POPULATION EQUALITY AND THE IMPOSITION OF RISK ON PARTISAN GERRYMANDERING

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## INTRODUCTION

The requirement for equal population across legislative districts constrains partisan ambition by imposing risk on partisan gerrymanders. This risk comes from the fact that a party attempting a partisan gerrymander must give itself relatively narrow and, therefore, potentially unstable majorities in a large number of districts. This Article examines the question of how much partisan advantage a party can take without running an uncomfortable risk of the plan backfiring. The Article estimates the size of the initial majority that a party must give itself in a district for that majority to be stable until the next round of redistricting and then calculates the number of safe districts the scheming party must cede to the disadvantaged party in order to guarantee the stability of its partisan advantage. This Article finds that actual redistricting plans frequently create less of a partisan advantage than parties could safely take under reasonable assumptions. Hence, partisan ambition may be constrained by some factor other than the risk imposed by the population equality requirement.

Prior to the equal population requirement for legislative districts, a partisan gerrymander was a relatively straightforward proposition, carrying little risk and limited only by the precision of one's data and one's own brazenness. Consider the position of someone charged

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with redrawing district lines without an equal population constraint. With partisan goals, perfect data, and no shame, the optimal strategy would be as follows: Group every voter affiliated with the disadvantaged party into a single, overpopulated district that maintains contiguity only by being so misshapen as to make Elbridge Gerry's salamander look like the state of Wyoming, and divide the rest of the state's population, consisting entirely of voters belonging to the advantaged party, into the remaining districts, which would be necessarily underpopulated. The resulting plan would give the disadvantaged party only one district, while giving the advantaged party perfectly stable majorities (by virtue of unanimity) in each of the remaining districts. Of course, such a plan would never be possible because one's data can never be so precise (particularly since data were less precise in the pre-*Baker v. Carr* era anyway), and shame, if not a conscience may prevent mischief-makers from attempting anything so crass. In the absence of an equal population requirement, however, there is no legal barrier to such a scheme without an objective standard by which partisan gerrymanders may be rejected.[1]

The purpose of an equal population standard for legislative districts is not to place a limit on partisan ambition, and there are other philosophical reasons for such a standard. One of the interesting consequences of an equal population standard, however, is to limit partisan ambition by making the scheme described above illegal. Under an equal population standard, a party must be willing to run a risk in order to attempt a partisan gerrymander.

The strategy for a partisan gerrymander after the Reapportionment Revolution is the "pack-and-crack" approach, so named for the way that disadvantaged party voters are grouped. Disadvantaged party voters are "packed" into a small set of districts with inefficiently large supermajorities, guaranteeing them victory in these districts, but by larger margins than they need. In the remaining districts, disadvantaged party voters are "cracked" into relatively large minorities so that the advantaged party retains relatively small majorities in a large number of districts. Since advantaged party voters are spread more efficiently across districts than disadvantaged party voters, the advantaged party is likely to win more seats than its overall proportion of the state's population.

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[1] In *Davis v. Bandemer*, 478 U.S. 109, 119 (1986), the Supreme Court held that a redistricting plan could, in principle, be rejected because it is a partisan gerrymander, but the Court has declined to reject any redistricting plan on that basis because of a failure to agree on a standard by which partisan gerrymanders should be rejected.

Unlike the previous scheme, however, this plan entails a risk. Consider an arbitrary group of thirty-three voters, consisting of twelve voters from Party *A* and twenty-one voters from Party *B*. If Party *A* must draw three districts of equal population, then, in principle, it can draw two districts consisting of six voters from Party *A* and five from Party *B*, and a third district consisting only of eleven voters from Party *B*. Such a plan gives Party *A* a majority in two out of three districts, despite the fact that it only holds approximately one third of the group's population. The problem with attempting to do so is that a slight shift in preferences can have devastating consequences. If just two voters from Party *A* switch allegiances, one from each of the two Party *A*-majority districts, Party *A* becomes the minority in all districts, and Party *B* wins all three districts.

Grofman and Brunell refer to such a backfired attempt at a partisan gerrymander as a "dummymander," and the potential for a dummymander means that under an equal population standard, a party must be willing to absorb a certain level of risk in order to take partisan advantage of drawing district lines.[2] A risk-acceptant party may attempt a pack-and-crack scheme, while a more risk-averse party would prefer a bipartisan gerrymander, in which voters of each party are packed inefficiently into their districts, thus guaranteeing each party a certain number of seats beyond which it can go neither above nor below. Interestingly, bipartisan gerrymanders have a number of positive representational consequences, which suggests that when risk-aversion is combined with an equal population standard, partisan ambition can be checked, with small-d democratic benefits.[3]

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[2] Bernard Grofman & Thomas L. Brunell, *The Art of the Dummymander: The Impact of Recent Redistricting on the Partisan Makeup of Sothern House Seats*, *in* REDISTRICTING IN THE NEW MILLENNIUM 183, 184 (Peter Galderisi ed., 2005).

[3] *See* THOMAS L. BRUNELL, REDISTRICTING AND REPRESENTATION: WHY COMPETITIVE ELECTIONS ARE BAD FOR AMERICA 32–34 (2008) (asserting that voters in gerrymandered districts are more satisfied with the results of an election because the voters are more likely to have their preferred candidate win); JUSTIN BUCHLER, HIRING AND FIRING PUBLIC OFFICIALS: RETHINKING THE PURPOSE OF ELECTIONS 145–46 (2011) (arguing that bipartisan gerrymandering produces districts with more homogeneous constituencies; allowing elected officials to represent the interests and policies of a larger portion of their constituency than in a competitive district); Justin Buchler, *Resolved, The Redistricting Process Should Be Nonpartisan: Con*, *in* DEBATING REFORM 161–71 (Richard J. Ellis & Michael Nelson eds., 2011) (arguing that more homogenous districts are in both voters and elected official's best interests); Thomas L. Brunell & Justin Buchler, *Ideological Representation and Competitive Congressional Elections*, 28 ELECTORAL STUD. 448, 450 (2009) (arguing that less competitive elections elect representatives that are ideologically closer to their constitutions which in turn improves voter attitudes regarding their elected representatives and Congress); Thomas L. Brunell, *Rethinking Redistricting: How Drawing Uncompetitive Districts Eliminates Gerrymanders, Enhances Representation, and Improves Attitudes Toward Congress*, 39 PS: POL. SCI. & POL. 77 (2006) (discussing the positive aspects of non-competitive districts); Justin Buchler, *The Social Sub-Optimality of Competitive Elections*, 133 PUB. CHOICE 439 (2007)

There is an important question, however, that has gone peculiarly unanswered. How much does the equal population standard limit partisan ambition? Put somewhat differently, how far can a scheming politician wade into the territory of a partisan gerrymander without incurring too much risk? This Article attempts to answer that question both theoretically and empirically. The results suggest that an ambitious politician could probably take more partisan advantage of controlling the process than most generally do while incurring relatively minimal risk.

## I. How Safe Is Safe?

If the constraint that equal population places on partisan ambition is the imposition of risk, then our first task must be to measure that risk. Suppose that the party controlling the redistricting process has just over 25 percent of the population. In principle, that party can give itself a bare majority in a bare majority of districts ($0.5 \times 0.5 = 0.25$), and win a majority of the seats despite having only one fourth of the state's population. A party with a bare majority in the state, in principle, can give itself a bare majority of the population in each district by making each district a microcosm of the state, possibly then winning every district with only just over half of the state's population.

The problem with each of these strategies is that a bare majority does not guarantee victory. So, we must begin with a simple empirical question. How big of a majority must a scheming party give itself in a House district when drawing the lines in order to count on holding that district until the next round of redistricting? Is 55 percent enough? It is a majority, but a party's 55-45 percent partisan advantage in a district does not guarantee victory in that district. The majority party might field a weaker candidate than the minority party. Public opinion might shift over time. District populations change over time due to birth rates, death rates, and migration patterns. Many things can happen to cause the party with an initial partisan advantage in a district to lose that district at some point before the next census,

(arguing that competitive elections: (1) do not produce socially optimal outcomes, (2) are not procedurally appropriate, and (3) do not imply healthy electoral procedures); Justin Buchler, *The Statistical Properties of Competitive Districts: What the Central Limit Theorem Can Teach Us About Election Reform*, 40 PS: POL. SCI. & POL. 333 (2007) (arguing that competitive elections can produce negative consequences); Justin Buchler, *Competition, Representation and Redistricting: The Case Against Competitive Congressional Districts*, 17 J. THEORETICAL POL. 431 (2005) (arguing that non-competitive gerrymanders maximize the representativeness of political outcomes).

and the slimmer the advantaged party's initial majorities are in their own districts, the greater the risk that something will happen to cause them to lose these districts before the end of the redistricting cycle.

So the important empirical question is: How big must a party make its initial majority before it can consider a district "safe" in practical terms? Given some restrictive parametric assumptions, statistical theory could answer that question, but those answers would, of course, be dependent on those parametric assumptions. There is no point in doing so when we can simply measure the risk empirically. If a party has a 55–45 percent advantage in a district, how often does that party win, empirically? All we need to do is to examine the frequency with which parties win congressional elections for any given initial partisan advantage.

Measuring partisan advantage in a district is a relatively straightforward matter. The most common measure of district partisanship is the presidential vote within a district since the primary determinant of vote choice in presidential elections is party identification. So, we can examine a party's success rate in House elections in districts in which its presidential candidate gets between 50 and 55 percent of the vote, when its candidate gets between 55 and 60 percent, and so on.

Conventional wisdom holds that competitive districts are disappearing due to gerrymandering, in which case there will be an insufficient number of closely divided districts to examine in the modern era. Of course, though, this is empirically wrong. Figure 1, below, shows the proportion of House districts in presidential elections from 1952 to 2008 in which the two presidential candidates were separated by ten points or less in the two-party vote. For more detail, Figure 2 shows a histogram of Bill Clinton's share of the two-party vote within House districts in 1992, which was a presidential election immediately following a round of redistricting. Figure 3 shows a histogram of what Gore's share of the two-party vote within House districts would have been in 2000 had the district lines looked the way they did in 2002, after that round of redistricting. All data were provided generously by Gary C. Jacobson.

Figure 1: Percent of House districts with less than a ten-point gap between major party presidential candidates, by election.

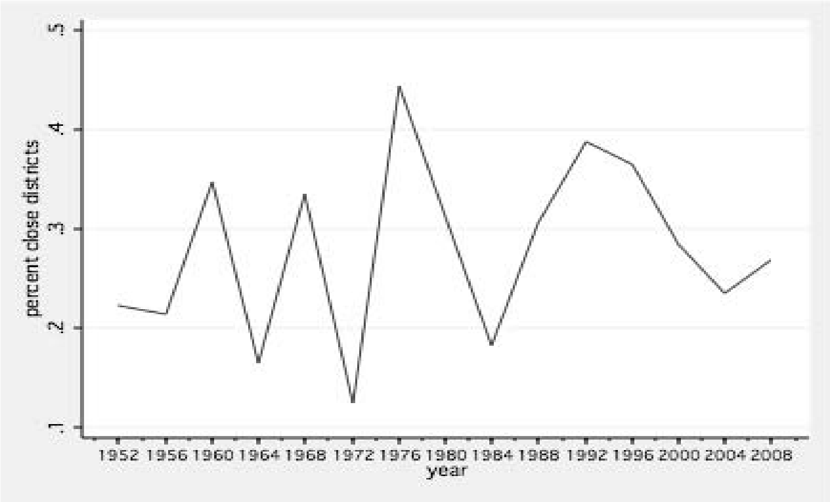



Figure 2: Clinton's 1992 share of the two-party vote by 1992 House district.

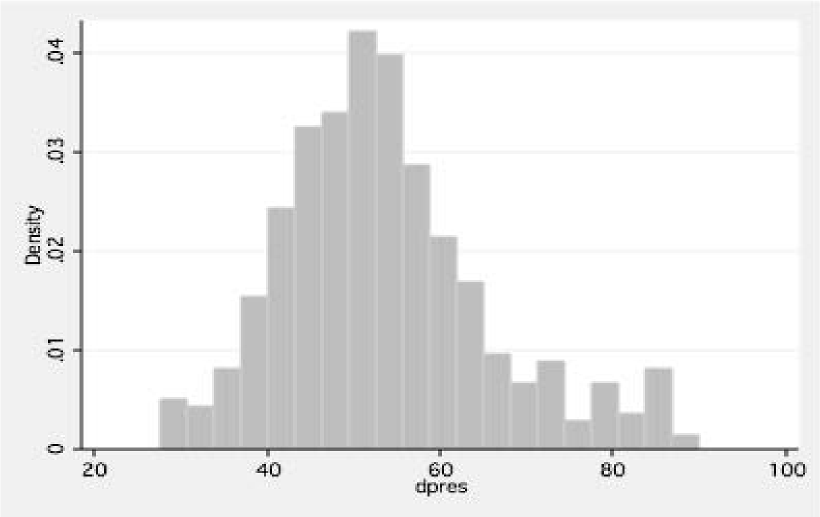
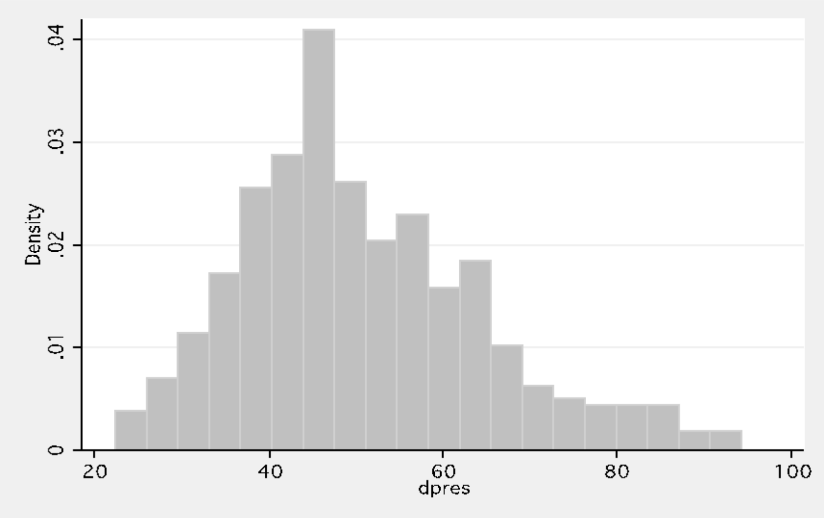


Figure 3: Gore's 2000 share of the two-party vote by 2002 House districts.




The results in these figures are quite clear, and they demonstrate that gerrymandering has done little to diminish the number of competitive districts since 1952, as I have noted elsewhere.[4] The number of competitive districts has fluctuated essentially randomly since 1952, and both the post-1990 redistricting cycle and the post-2000 redistricting cycle yielded ample competitive districts to examine.

The following tables show how often each party wins House elections for any given range of partisan advantage when the district is initially drawn. Democratic and Republican advantages and victories are examined separately, as are the success rates following the 1990s redistricting plans and following the 2000s redistricting plans. As in Figure 3, the calculations for House elections in the 2000's are based on the percentages that Gore would have won in 2000 with 2002 district lines.

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[4] *See e.g.,* Buchler, *Resolved*, *supra* note 3 (discussing the incentives of creating non-competitive districts); Justin Buchler, *The Inevitability of Gerrymandering: Winners and Losers Under Alternative Approaches to Redistricting*, 5 DUKE J. CONST. L. 17 (2010) (examining the incentives to engage in by-partisan gerrymandering)

Table 1: The probability of Democratic victory in the House election by Bill Clinton's 1992 share of the two-party vote.

| Clinton Vote | 1992 | 1994 | 1996 | 1998 | 2000 | Average |
|---|---|---|---|---|---|---|
| (50%-55%) | 63% | 44% | 47% | 46% | 46% | 49% |
| (55%-60%) | 82% | 68% | 75% | 80% | 80% | 77% |
| (60%-65%) | 85% | 85% | 85% | 90% | 93% | 88% |
| (65+%) | 100% | 100% | 97% | 97% | 97% | 98% |

Table 2: The probability of Republican victory in the House election by George H.W. Bush's 1992 share of the two-party vote.

| Bush 41 Vote | 1992 | 1994 | 1996 | 1998 | 2000 | Average |
|---|---|---|---|---|---|---|
| (50%-55%) | 56% | 79% | 78% | 78% | 77% | 74% |
| (55%-60%) | 75% | 93% | 95% | 95% | 95% | 91% |
| (60%-65%) | 93% | 93% | 96% | 96% | 96% | 95% |
| (65+%) | 88% | 94% | 100% | 100% | 100% | 96% |

Table 3: The probability of Democratic victory in the House election by Al Gore's 2000 share of the two-party vote.

| Gore Vote | 2002 | 2004 | 2006 | 2008 | 2010 | Average |
|---|---|---|---|---|---|---|
| (50%-55%) | 57% | 55% | 72% | 81% | 55% | 64% |
| (55%-60%) | 83% | 85% | 91% | 96% | 91% | 89% |
| (60%-65%) | 100% | 100% | 100% | 100% | 100% | 100% |
| (65+%) | 100% | 100% | 100% | 98% | 100% | 99% |

Table 4: The probability of Republican victory in the House election by George W. Bush's 2000 share of the two-party vote.

| Bush 43 Vote | 2002 | 2004 | 2006 | 2008 | 2010 | Average |
|---|---|---|---|---|---|---|
| (50%-55%) | 79% | 78% | 63% | 48% | 79% | 69% |
| (55%-60%) | 83% | 83% | 72% | 62% | 93% | 79% |
| (60%-65%) | 92% | 96% | 96% | 92% | 100% | 95% |
| (65+%) | 89% | 94% | 89% | 89% | 98% | 92% |

Tables 1 through 4 show us how big a party's initial majority must be in order to make a district truly safe. Consider Table 1. In 1992, Democrats won 63 percent of the House elections in districts in which Bill Clinton carried between 50 and 55 percent of the two-party vote. However, 1994 was a Republican wave election, which is exactly the point of the analysis here. In each election cycle from 1994 through 2000, Democrats actually won a minority of the House seats in districts where Bill Clinton got between 50 and 55 percent of the two-party vote in 1992. If Democrats had counted on those seats to be safe Democratic seats throughout the 1990s, they would have been sorely disappointed. This demonstrates precisely why it would be risky for a party to give itself majorities between 50 and 55 percent hoping that those majorities will be stable for a decade.

On the other hand, the districts in which Clinton got over 65 percent of the two-party vote in 1992 were essentially solid Democratic seats for the decade, with minimal although non-zero risks. Tables 2 through 4 show similar patterns. Once a party reaches a 65 percent partisan advantage at the beginning of the cycle, the seats are relatively solid throughout the decade. Republicans had some difficulty with such districts in the 2000s, which makes some sense given the Democratic waves in 2006 and 2008, but to the degree that there is a threshold of relative safety, 65 percent seems to be a reasonable estimate of that threshold. This threshold still entails some risk, though, and that point is addressed in the conclusion.

Empirical analysis of party success in House elections suggests that if a party controlling the redistricting process wants to give itself majorities in a set of House districts that are likely to be reasonably stable throughout the decade, it should not give itself majorities of less than 65 percent in those districts. The question, then, is how many seats must a party cede to the opposing party to reach the 65 percent threshold in its own districts? The answer to that question will tell us the degree to which the equal population standard checks partisan ambition by imposing risk.

## II. Achieving Stable Majorities

The previous Section demonstrated that if a scheming party wants to ensure that it does not lose the seats in districts where it gave itself a majority, it should give itself at least a 65 to 35 percent partisan advantage in in those seats. Below that, the party begins to incur an uncomfortable level of risk because of the factors discussed earlier, such as the potential for public opinion to shift, population changes, or variation in candidate quality over time. However, if the party drawing district lines does not want to give itself less than 65% of the population in its own districts, that puts a limit on the number of districts in which it can hold a majority.

So, this Section proposes a simple model for examining the relationship between the number of districts that a scheming party attempts to take and the size of the majority the scheming party must give itself in those districts to maintain population equality. The model uses four simple factors ($N$, $d$, $p$, $e$). Let $N$ represent the number of districts a state must draw. Let us assume, for the sake of mathematical convenience, that all voters belong either to the "advantaged" party, meaning the party redrawing district lines, or the "disadvantaged" party, meaning the party that does not control the redistricting process. Let *d* represent the proportion of the state's population belonging to the disadvantaged party. Thus, (1 - *d*) is the proportion of the state's population belonging to the advantaged party. Let *p* represent the number of districts that the advantaged party will pack with inefficiently large supermajorities of the disadvantaged party. Finally, let *e* represent the efficiency of that packing. That efficiency figure is a number between 0 and 1 representing the proportion of voters in a packed district belonging to the disadvantaged party. For example, if the advantaged party packs opposing party voters into districts such that they constitute an 80 percent majority in any given packed district, then *e* = 0.8.

For any given combination of values for *N*, *d*, *p* and *e*, we can calculate the proportion of voters outside the disadvantaged party's packed districts who are affiliated with the advantaged party. If the advantaged party divides its voters equally in the districts it attempts to take, then this proportion will be the advantaged party's majority size in each of the unpacked districts. That proportion is derived below.

First, *p*/*N* is the proportion of the state's population residing in the districts packed with disadvantaged party voters. Since the proportion of the population in each of these districts consisting of disadvantaged party voters is *e* (by definition), it follows that (*ep*)/*N* is the proportion of the state's population consisting of disadvantaged party voters residing in the packed districts. Since the proportion of the state's population consisting of disadvantaged party voters is d, it follows that *d* - (*ep*/*N*) is the proportion of the state's population that belongs to the disadvantaged party and resides outside the "packed" districts.

Next, since there are *N* districts, p of which are packed with disadvantaged party voters, it follows that (*N* - *p*)/*N* is the proportion of the state's total population residing outside the packed districts. Thus, the following figure is the proportion of the state's population outside of the packed districts who belong to the disadvantaged party:

$$\frac{d - \frac{ep}{N}}{\frac{N-p}{N}}$$

Since all voters belong either to the advantaged or disadvantaged party, the proportion of the state's population outside of the packed districts who belong to the advantaged party is given by the following:

$$1 - \left( \frac{d - \frac{ep}{N}}{\frac{N-p}{N}} \right)$$

So, if the advantaged party wants to spread these voters as efficiently as possible among the non-packed districts, it will give itself a majority in each of the non-packed districts equal to the following proportion:

$$1 - \left( \frac{d - \frac{ep}{N}}{\frac{N-p}{N}} \right)$$

Thus, we have the precise mathematical relationship between the number of districts that the advantaged party attempts to take, and its majority size in each district, given the number of districts in the state, each party's proportion of the population, and the efficiency of the scheming party's packing system.

Of course, the quantity described above contains four parameters, which makes it difficult to visualize. In order to facilitate interpretation, we can use a set of tables to calculate hypothetical values. For the sake of simplicity, let us examine a hypothetical state with 20 districts, so $N = 20$. Furthermore, let us begin with the hypothetical case of 100 percent efficiency of packing, so $e = 1$. So, the advantaged party can pack disadvantaged party voters into districts with such efficiency that every voter in the packed districts belongs to the disadvantaged party. How large will advantaged party majorities be in the non-packed districts? Obviously, that depends on the advantaged party's proportion of the population and the number of districts that they pack with disadvantaged party voters. Let us assume that the party drawing the lines is the majority party, and since 65 percent seems to be an analytically useful threshold, let us examine values of d from .35 to .49, representing majority party populations ranging from 51 to 65 percent. Furthermore, let us examine the consequences of packing at least one and no more than eight districts with voters from the disadvantaged party. The table below shows the majority party's percentage of the population in each non-packed district for any given minority party size and number of packed districts.

Table 5: Majority size in non-packed districts, 20 districts and 100 percent packing of minority.

| | Number of Packed Minority Districts | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Minority | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0.35 | 68% | 72% | 76% | 81% | 87% | 93% | | |
| 0.36 | 67% | 71% | 75% | 80% | 85% | 91% | 98% | |
| 0.37 | 66% | 70% | 74% | 79% | 84% | 90% | 97% | |
| 0.38 | 65% | 69% | 73% | 78% | 83% | 89% | 95% | |
| 0.39 | 64% | 68% | 72% | 76% | 81% | 87% | 94% | |
| 0.4 | 63% | 67% | 71% | 75% | 80% | 86% | 92% | |
| 0.41 | 62% | 66% | 69% | 74% | 79% | 84% | 91% | 98% |
| 0.42 | 61% | 64% | 68% | 73% | 77% | 83% | 89% | 97% |
| 0.43 | 60% | 63% | 67% | 71% | 76% | 81% | 88% | 95% |
| 0.44 | 59% | 62% | 66% | 70% | 75% | 80% | 86% | 93% |
| 0.45 | 58% | 61% | 65% | 69% | 73% | 79% | 85% | 92% |
| 0.46 | 57% | 60% | 64% | 68% | 72% | 77% | 83% | 90% |
| 0.47 | 56% | 59% | 62% | 66% | 71% | 76% | 82% | 88% |
| 0.48 | 55% | 58% | 61% | 65% | 69% | 74% | 80% | 87% |
| 0.49 | 54% | 57% | 60% | 64% | 68% | 73% | 78% | 85% |

Table 5 shows, for example, that if the minority party represents 45 percent of the population ($d = 0.45$), and the majority party packs 3 out of 20 districts exclusively with voters of the minority party, then in each of the remaining 17 districts, the advantaged party will have the critical threshold of 65 percent of the population, and the minority party will have 35 percent of the population. Thus, by packing just 3 districts with perfect efficiency, the majority can give itself 65 percent majorities in the remaining districts rather than the riskier level of 55 percent that it would have if it simply made each district a microcosm of the state. By giving up three seats deterministically, the majority party makes its remaining seventeen seats essentially safe. With 100 percent efficiency in its packing, a party with 55 percent of the population can give itself stable majorities in 85 percent of the districts of a state with 20 districts.

Of course, packing districts with 100 percent efficiency is never possible, so the calculations in Table 5 are not realistic assessments of the tradeoffs that parties make when they redraw district lines. So, let us examine a more realistic packing efficiency of 0.75. When $e$ = 0.75, the majority party can pack minority party voters into a small number of districts such that in each packed district, 75 percent of voters belong to the state's minority party. How do our calculations change? Table 6 below shows the proportion of each non-packed district belonging to the majority party given 75 percent packing efficiency and 20 districts in the state for any given number of packed districts and minority party population in the state.

Table 6: Majority size in non-packed districts, 20 districts and 75 percent packing of minority.

| | **Number of Packed Minority Districts** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Minority | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 0.35 | 67% | 69% | 72% | 75% | 78% | 82% | 87% | 92% |
| 0.36 | 66% | 68% | 71% | 74% | 77% | 81% | 85% | 90% |
| 0.37 | 65% | 67% | 70% | 73% | 76% | 79% | 83% | 88% |
| 0.38 | 64% | 66% | 69% | 71% | 74% | 78% | 82% | 87% |
| 0.39 | 63% | 65% | 67% | 70% | 73% | 76% | 80% | 85% |
| 0.4 | 62% | 64% | 66% | 69% | 72% | 75% | 79% | 83% |
| 0.41 | 61% | 63% | 65% | 68% | 70% | 74% | 77% | 82% |
| 0.42 | 60% | 62% | 64% | 66% | 69% | 72% | 76% | 80% |
| 0.43 | 59% | 61% | 63% | 65% | 68% | 71% | 74% | 78% |
| 0.44 | 58% | 59% | 61% | 64% | 66% | 69% | 73% | 77% |
| 0.45 | 57% | 58% | 60% | 63% | 65% | 68% | 71% | 75% |
| 0.46 | 56% | 57% | 59% | 61% | 64% | 66% | 70% | 73% |
| 0.47 | 54% | 56% | 58% | 60% | 62% | 65% | 68% | 72% |
| 0.48 | 53% | 55% | 57% | 59% | 61% | 64% | 67% | 70% |
| 0.49 | 52% | 54% | 56% | 58% | 60% | 62% | 65% | 68% |

The calculations in Table 6 differ somewhat from Table 5. When the majority party can only pack minority party voters into their districts with 75 percent efficiency rather than 100 percent efficiency, the majority party must be willing to give up more seats in order to achieve the same majority size in the non-packed districts. Now, if the minority party holds 45 percent of the state population ($d = 0.45$) and the majority party packs three districts with voters from the minority party, the majority party will hold 60 percent of the population in the remaining 17 non-packed districts. Thus, going from 100 percent efficiency in the packing scheme to 75 percent efficiency means that packing 3 districts gives the majority party only a 5 percent increase in its majority in the non-packed districts.

If the scheming party with 55 percent of the population is willing to give up 5 districts, however, packing those 5 districts with minority party voters with 75 percent efficiency gives the scheming party the critical threshold of 65 percent in the remaining 15 districts. Thus, in a state with 20 districts, a majority party representing 55 percent of the population can give itself stable majorities in 75 percent of the districts with a plausible packing system that is only 75 percent efficient. The scheming party may lose one seat once in a while, giving it only 70 percent of the districts, but it is unlikely to lose more than that. That is a large representational gap. A party can, with minimal risk and a reasonable level of packing efficiency, achieve a 20 percentage point seat-vote gap.

In fact, what is perhaps most surprising about the magnitude of this gap is that we do not observe such gaps as frequently as we would expect. Consider the State of Ohio, which had 19 House districts after the 1990 census, and 18 House districts after the 2000 census. Table 7 shows the proportion of U.S. House districts in Ohio won by the Democratic Party in each election beginning with 1992.

Table 7: Percent of U.S. House districts in Ohio won by Democrats.

| **Election Year** | **Percent of Democratic wins in Ohio** |
|---|---|
| 1992 | 53% |
| 1994 | 32% |
| 1996 | 42% |
| 1998 | 42% |
| 2000 | 42% |
| 2002 | 33% |
| 2004 | 33% |
| 2006 | 39% |
| 2008 | 56% |
| 2010 | 28% |

It was not until the 2010 Republican sweep that a party approached the 75 percent figure that a 55 percent majority party could theoretically achieve with a 75 percent-efficient packing system in a 20-district state. The post-2010 census redistricting plan passed in Ohio was seen by some as an attempt to consolidate the gains Republicans made in the 2010 wave election that carried them to 72 percent of the U.S. House districts in Ohio.[5] While some might be surprised by the fact that Republicans did not attempt to increase their advantage in U.S. House districts from the state beyond what they won in 2010, the analysis here suggests that they probably could not have pushed their advantage much further without running an uncomfortable level of risk. The surprise is that more parties do not attempt to secure so many seats given the relatively modest risks. The mystery is not why Republicans attempted to use redistricting in Ohio to consolidate their 2010 gains. The mystery is why we do not observe parties attempting to create such disproportionalities more frequently.

## CONCLUSION

This Article has presented some simple calculations to show exactly how much the equal population requirement constrains the impulse towards a partisan gerrymander. But the Article cannot deduce an optimal party strategy. After all, a party's optimal strategy depends on its level of risk aversion. A risk-averse party's optimal choice may be something close to a bipartisan gerrymander, whereas a risk-acceptant party's optimal choice may be to attempt an egregious partisan gerrymander. One could easily construct a utility function for a party's number of seats that makes a bipartisan gerrymander optimal, and one could easily construct a utility function for a party's number of seats that makes a very risky partisan gerrymander optimal. The calculations in this Article, however, show the actual nature of the tradeoff, and the surprising thing is how far a risk-averse party can go taking partisan advantage without running serious risks. After all, in a state with 20 districts, a party with a 55 percent majority can win 75 percent of legislative districts if they can pack the remaining districts with minority party voters with 75 percent efficiency. That twenty point seat-vote gap is larger than the

[5] *See* David Kushma, *Ohio Gerrymander Another GOP Overreach*, TOLEDO BLADE Sept. 25, 2011, at B5. Kushma noted that with the loss of two House districts from the state after the 2010 Census, the new redistricting plan could give Republicans 12 out of 16 House districts, yielding 75 percent of House districts in Ohio, which is roughly equal to the 72 percent of House districts in Ohio that Republicans won in 2010, given the loss of two districts from the state. *Id.*

seat-vote gaps that we normally observe, which suggests that parties do not take as much partisan advantage of the process as they could. The reasons are unclear.

One possible explanation is that parties simply do not know how far they can go. While the calculations presented in this Article are not complicated, they are also not widely known. That parties would not go through similar calculations even if scholars have not bothered to do so is difficult to believe, but anecdotal evidence of "dummymanders" may have more impact of their decisions than abstract calculations.

Alternatively, parties may simply be more risk-averse than even this Article suggests. The calculations discussed above were based on a threshold of safety that occurs when a party has an initial majority of 65 percent within a district. But even at an initial majority of 65 percent, the majority party runs some risk of loss, as Tables 1 through 4 demonstrated. So, perhaps scheming parties simply want to give themselves even more stable majorities. The problem with this explanation is the surprisingly large number of districts in which the parties are separated by less than ten points in the presidential vote. The frequency with which we see these districts suggests that parties are not simply adopting the most risk-averse partisan plans. After all, a risk-averse partisan gerrymander in which the majority party gives itself 70 percent majorities in its own districts and gives the minority party 80 percent majorities in their districts will still yield zero districts where the presidential candidates are separated by less than ten points, but empirically, the number of such districts is usually well above 20 percent of all House districts. So, unusually high levels of risk aversion cannot explain the failure of parties to take the maximum amount of partisan advantage.

That leaves two possibilities, between which this Article cannot distinguish. First, parties may simply have too many other considerations. After all, some legislators might prefer a district with a less extreme partisan imbalance, either because they view themselves as moderates, or because they ran for office originally from a district overlapping with their previous office (e.g., a state legislative district), and they want to avoid dramatic changes to their districts because they would rather maintain the same constituents with whom they have established relationships than form links with new constituents, even if those new constituents might be more strongly in the incumbent's party. After all, members of Congress painstakingly look for ways to establish direct relationships with their constituents.[6]

Alternatively, there may be other sources of constraint. Partisan officials could, in principle, feel some level of shame for an egregiously partisan gerrymander, or at least fear a political backlash if they go too far. There may even be legal consequences. While the Supreme Court has never overturned a redistricting plan because the plan is a partisan gerrymander, it has ruled that the issue is justiciable, and that a plan could, in theory, be such an egregious partisan gerrymander that it should be rejected.[7] Without an explicit standard, though, partisan officials may be unwilling to push the legal limits. Ultimately, why parties do not press their partisan advantage as much as they could is unclear, but we cannot address the issue without examining the actual risks of a partisan gerrymander, and this Article shows that the equal population standard imposes less risk on partisan gerrymanders than one might suspect.

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[6] *See* BRUCE CAIN ET AL., THE PERSONAL VOTE: CONSTITUENCY SERVICE AND ELECTORAL INDEPENDENCE 27–97 (1987) (discussing the different ways elected representatives engage with a constituency); RICHARD F. FENNO, JR., HOME STYLE: HOUSE MEMBERS IN THEIR DISTRICTS 54–124 (1978) (discussing the ways in which a representative connects with a constituency).

[7] Davis v. Bandemer, 478 U.S. 109, 143 (1986) (plurality op.).