University of Chicago Law School
Chicago Unbound

Public Law and Legal Theory Working Papers | Working Papers

2017

The Causes and Consequences of Gerrymandering

Nicholas Stephanopoulos

Follow this and additional works at: https://chicagounbound.uchicago.edu/public_law_and_legal_theory

 Part of the Law Commons

Chicago Unbound includes both works in progress and final versions of articles. Please be aware that a more recent version of this article may be available on Chicago Unbound, SSRN or elsewhere.

Recommended Citation
Stephanopoulos, Nicholas, "The Causes and Consequences of Gerrymandering" (2017). *Public Law and Legal Theory Working Papers*. 669.
https://chicagounbound.uchicago.edu/public_law_and_legal_theory/669

This Working Paper is brought to you for free and open access by the Working Papers at Chicago Unbound. It has been accepted for inclusion in Public Law and Legal Theory Working Papers by an authorized administrator of Chicago Unbound. For more information, please contact unbound@law.uchicago.edu.

THE CAUSES AND CONSEQUENCES OF GERRYMANDERING

Nicholas O. Stephanopoulos*

In recent years, scholars have made great strides in measuring the extent of partisan gerrymandering. By and large, though, they have not yet tried to answer the questions that logically come next: What are the causes *of district plans' partisan skews? And what* consequences *do these skews have for democratic values? Using a unique dataset of state house and congressional plans' partisan tilts from 1972 to the present, this Article addresses precisely these issues. It finds that single-party control of the redistricting process dramatically benefits the party in charge, while other mapmaking configurations have small and inconsistent effects. It also shows that greater black representation and greater urbanization have a modest pro-Republican impact, albeit one that fades when Democrats are responsible for redistricting. It concludes as well that the harm of gerrymandering is not limited to divergences between parties' seat and vote shares. The injury extends, rather, to the distortion of the representation that legislators provide to their constituents.*

* Assistant Professor of Law, University of Chicago Law School

Electronic copy available at: https://ssrn.com/abstract=2990638

TABLE OF CONTENTS

INTRODUCTION

In recent years, some of the most important questions about partisan gerrymandering have been answered. How should we measure the extent to which a district plan benefits (or disadvantages) a party? Scholars have introduced metrics like the *efficiency gap*[1] and *partisan bias*[2] that are easy to calculate and so intuitive that courts have begun relying on them.[3] What does the distribution of plans' partisan fairness look like? Based on historical data spanning several decades, the distribution is centered on zero (or no edge for either party) and normal in shape.[4] And how has plans' partisan skew changed over time? In earlier periods, maps tended to assist Democrats, while over the last couple decades, they have tilted ever further in a Republican direction.[5]

Despite this progress, there is still much that we don't know, especially about the *causes* and *consequences* of partisan gerrymandering. By causes I mean all of the factors that may affect a district plan's partisan fairness. One set of these factors relates to the institution responsible for redistricting. We might hypothesize (in the absence of reliable evidence) that when a party has full control of the line-drawing process, the resulting map is usually skewed in its favor. Conversely, we might expect that when control of the state government is divided—or when a commission or court crafts the boundaries—the ensuing plan is comparatively neutral.

A second set of factors involves minority representation. A common argument is that Republicans profit as more districts are drawn in which minority voters are able to elect their preferred candidates. The logic is that these districts tend to elect Democratic candidates by overwhelming margins. The districts therefore waste large numbers of Democratic votes, enabling Republican candidates to win more of a plan's remaining seats.

---

[1] *See, e.g.*, Nicholas O. Stephanopoulos & Eric M. McGhee, *Partisan Gerrymandering and the Efficiency Gap*, 82 U. CHI. L. REV. 831, 849-55 (2015).

[2] *See, e.g.*, Andrew Gelman & Gary King, *Enhancing Democracy Through Legislative Redistricting*, 88 AM. POL. SCI. REV. 541, 543 (1994).

[3] *See* LULAC v. Perry, 548 U.S. 399, 419-20 (2006) (opinion of Kennedy, J.) (discussing partisan bias); Whitford v. Gill, 218 F. Supp. 3d 837, 903-10 (W.D. Wis. 2016) (discussing the efficiency gap).

[4] *See* Stephanopoulos & McGhee, *supra* note 1, at 870.

[5] *See id.* at 873.

Electronic copy available at: https://ssrn.com/abstract=2990638

A final concept that is often linked to partisan fairness is political geography. Here the typical claim is that Democratic voters are heavily concentrated in urban areas while Republican voters are more efficiently distributed in suburban, exurban, and rural regions. Accordingly, Democrats are "naturally" packed in a small number of districts, allowing Republicans to win more seats (by slimmer margins) thanks to their superior spatial allocation.

Turning to the consequences of partisan gerrymandering, the most salient is how voters are represented by their legislators. The voting records of Democratic and Republican legislators, of course, are almost always different. Most Democrats take more liberal positions while most Republicans adopt more conservative stances. A reasonable hypothesis, then, is that as a district plan skews further in a Democratic (Republican) direction, the ideological midpoint of the legislature becomes more liberal (conservative)—even keeping constant the preferences of the electorate. Electing more of a party's members for the same share of the statewide vote may be expected to yield ideological dividends.

These causes and consequences, it is worth emphasizing, are of more than academic interest. If contemporary maps tend to benefit Republicans, for instance, but this edge is due to compliance with the Voting Rights Act or the country's political geography, then there may be little that can or should be done about the imbalance. On the other hand, if Republicans owe much of their advantage to control of the mapmaking process, then the case for intervention, judicial or political, becomes stronger. Similarly, we might not be too concerned about partisan gerrymandering if its damage is limited to bloodless concepts like seat and vote shares. But if gerrymandering distorts legislative representation—the beating heart of a democracy—then there may be more cause for alarm.

In this Article, I tackle these issues using a unique dataset of state house and congressional plans' efficiency gaps from 1972 to 2016. (The efficiency gap is a measure of partisan fairness that captures in a single number how much more "cracked" and "packed" one party's supporters are than the other party's backers.[6]) I pair this dataset with information on the institution responsible for designing each plan, black and Latino representation, the level of urbanization, and the ideologies of members of Congress. I also employ rigorous techniques like fixed effects regression and nearest-neighbor matching in order to come as close as is possible in a non-experimental setting to establishing causation.

I find, first, that unified control of the redistricting process produces a large and statistically significant shift in the efficiency gap in the direction of the party in charge. This result holds at both the state house and the congressional level. The benefit of unified control has also increased in the last two decades. However, other redistricting institutions have small and inconsistent effects on the efficiency gap. That is, neither party consistently gains from plans designed by courts, commissions, or divided governments.

Second, I show that greater black representation moves the efficiency gap in a Republican direction while greater Latino representation does not. This result also applies to both state house and congressional plans. The pro-Republican shift in the efficiency gap due to greater black representation, though, is substantively quite small. And the shift does not occur at all

[6] *See id.* at 849-55.

Electronic copy available at: https://ssrn.com/abstract=2990638

when Democrats are responsible for redistricting. The relationship between black representation and partisan fairness is therefore contingent, not compulsory.

Third, there is a link between urbanization and the efficiency gap in state house plans but *not* in congressional plans. At the state house level, Democrats tend to perform somewhat better in less urbanized states, while Republicans usually enjoy a modest advantage in more urbanized states. Interestingly, this link persists no matter which party is in charge of redistricting. It thus seems to be an intrinsic feature of contemporary state house maps (albeit one whose magnitude should not be overstated).

Lastly, the efficiency gap has a statistically and substantively significant impact on the ideological midpoint of a congressional delegation. In fact, a large pro-Democratic (pro-Republican) efficiency gap, on the order of ten percentage points, results in a liberal (conservative) shift in a delegation's ideological median of about half a standard deviation. Moving from a gerrymander favoring one party to a gerrymander aiding its adversary swings a delegation's ideological median by almost a full standard deviation—all without changing the mind of a single voter.

These findings support two main conclusions. The first is that partisan intent is the most potent driver of district plans' partisan fairness (or lack thereof). The deliberate manipulation of district lines by a party in unified control of the state government consistently affects the efficiency gap more than any other factor. Compared to full control of the redistricting process, other institutional arrangements, minority representation, and political geography pale in their influence.

The second conclusion is that partisan gerrymandering dramatically distorts congressional representation. Pro-Democratic gerrymanders make House delegations substantially more liberal than their states' electorates. Pro-Republican gerrymanders have an even larger effect in the opposite direction. The harm of gerrymandering is thus more than seat shares that are out of whack with vote shares. It is the ideological skewing of representation—and, with it, the policies that shape people's lives.

I begin this Article by surveying the limited existing literature on the causes and consequences of partisan gerrymandering, using it to generate a series of testable hypotheses. Next, I describe the data and methods that I employ in my analysis. In the core of the Article, I then explore how redistricting institutions, minority representation, and political geography are related to partisan fairness; and how partisan fairness is related to congressional representation. Lastly, I comment briefly on the implications of my results for the legal and political debates over gerrymandering.

I. HYPOTHESES

As noted at the outset, political scientists have developed several quantitative measures of district plans' partisan fairness, the best known of which are partisan bias and the efficiency gap. The older of these metrics, partisan bias, is the difference between a party's seat share and 50 percent in a hypothetical, perfectly tied election. Suppose, for instance, that a party receives 60

percent of the vote and 70 percent of the seats in an election. Suppose also that if the election had ended in a tie, the party would have received 55 percent of the seats. Then the plan's partisan bias in that election is 5 percent: 55 percent minus 50 percent.[7]

The newer metric, the efficiency gap, is rooted in the insight that partisan gerrymandering is always carried out in one of two ways: the *cracking* of a party's supporters among many districts, in which their preferred candidates lose by relatively narrow margins; or the *packing* of a party's backers in a few districts, in which their preferred candidates win by overwhelming margins. Both cracking and packing produce what are known as *wasted votes* because they do not contribute to a candidate's victory. In the case of cracking, all votes cast for the losing candidate are wasted; in the case of packing, all votes cast for the winning candidate, above the 50 percent (plus one) threshold needed for victory, are wasted. The efficiency gap is simply one party's total wasted votes in an election, minus the other party's total wasted votes, divided by the total number of votes cast. It captures in a single number all of the cracking and packing choices that go into a district plan, and reveals which party is advantaged by the plan and to what extent.[8]

Unfortunately, political scientists have devoted more effort to measuring partisan gerrymandering than to studying its causes and consequences. Starting with its causes, perhaps the most intuitive explanation for a map's partisan skew is the institution responsible for designing the map. When a single party fully controls the state government at the time of redistricting, that party typically has both the motive and the opportunity to enact a plan that benefits it and disadvantages its opponent. Assuming competence on the part of mapmakers, we may therefore hypothesize that unified control of the state government produces a partisan tilt in favor of the party in charge. On the other hand, other redistricting institutions—like bipartisan commissions, courts required to replace unlawful plans, and state governments where control is divided—have no obvious reason to favor either party. These institutions may *inadvertently* craft unbalanced maps at times, but we should not expect their handiwork to be systematically biased in either a Democratic or a Republican direction.

The available literature mostly confirms this reasoning with respect to unified control of the state government. Though they did not control for any other variables, Richard Niemi and Simon Jackman found that state house plans designed entirely by Democrats from 1970 to 1986 had an average pro-Democratic partisan bias of 4.1%, while wholly Republican-drafted maps had an average pro-Republican bias of 4.5%.[9] Similarly, using a model that incorporated lagged bias and whether a plan was redrawn in a given year, Andrew Gelman and Gary King showed that unified partisan control produced a 3 percentage point swing in bias in a party's favor in

---

[7] *See generally, e.g.*, ANTHONY J. MCGANN ET AL., GERRYMANDERING IN AMERICA: THE HOUSE OF REPRESENTATIVES, THE SUPREME COURT, AND THE FUTURE OF POPULAR SOVEREIGNTY 56-96 (2016); Gelman & King, *supra* note 2, at 543; Bernard Grofman & Gary King, *The Future of Partisan Symmetry as a Judicial Test for Partisan Gerrymandering After* LULAC v. Perry, 6 ELECTION L.J. 2, 6-13 (2007). The party's seat share in the counterfactual tied election (here, 55 percent) is computed by assuming that every district in the plan swings by the same amount (here, 10 percent) that is necessary to bring the statewide vote to exactly 50 percent.

[8] *See generally, e.g.*, Eric McGhee, *Measuring Partisan Bias in Single-Member District Electoral Systems*, 39 LEGIS. STUD. Q. 55, 68-70 (2014); Stephanopoulos & McGhee, *supra* note 1, at 849-55.

[9] *See* Richard G. Niemi & Simon Jackman, *Bias and Responsiveness in State Legislative Districting*, 16 LEGIS. STUD. Q. 183, 195 (1991).

state house elections from 1968 to 1988.[10] At the congressional level, Janet Campagna and Bernard Grofman did not detect significant differences in bias between Democratic- and Republican-controlled states in 1980 and 1982.[11] But using a cross-sectional model that also took into account minority population and urbanization, Nicholas Geodert determined that, in 2012, Democratic control shifted the efficiency gap by 17 percentage points in a Democratic direction, while Republican control shifted it by 14 points in a Republican direction.[12]

With respect to other redistricting institutions, I am unaware of any work that analyzes their effect on the *direction* of maps' partisan skew. However, Bruce Cain and his coauthors found that, in 2002, state house plans designed by commissions had an average *absolute* partisan bias of 4.0%, compared to 11.7% for maps crafted by legislatures.[13] Likewise, in an earlier article, I used fixed effects models to examine how commission usage, court usage, and divided government influenced the magnitude of the efficiency gap in state house and congressional elections from 1972 to 2012.[14] I concluded that all of these institutions reduced its size somewhat, with the impact most pronounced for divided government.[15]

The next factor that is often linked to partisan fairness is minority representation. In certain circumstances, the Voting Rights Act requires jurisdictions to create districts where minority voters are numerous enough to be able to elect their preferred candidates.[16] These districts tend to elect Democrats by large margins; minority voters lean heavily Democratic, so it stands to reason that when many of them are placed in certain districts, these districts tilt strongly in a Democratic direction. At the level of an entire plan, though, the construction of minority-opportunity districts may be expected to benefit Republicans. If minority voters (and Democrats) are concentrated in a small number of districts, then Republicans may be dispersed more

---

[10] *See* Gelman & King, *supra* note 2, at 553. Note that this is the swing relative to a *bipartisan* plan; the swing is twice as large relative to a plan designed by the opposite party.

[11] *See* Janet Campagna & Bernard Grofman, *Party Control and Partisan Bias in 1980s Congressional Redistricting*, 52 J. POL. 1242, 1252 (1990).

[12] *See* Nicholas O. Goedert, *Gerrymandering or Geography? How Democrats Won the Popular Vote but Lost the Congress in 2012*, RES. & POL., Apr.-June 2014, at 6 [hereinafter Goedert, *Gerrymandering or Geography?*] (using a metric closely related, but not identical, to the efficiency gap); *see also* Nicholas Goedert, *The Case of the Disappearing Bias: A 2014 Update to the "Gerrymandering or Geography" Debate*, RES. & POL., Oct.-Dec. 2015, at 5 [hereinafter Goedert, *Disappearing Bias*] (reporting a pro-Democratic boost of 11 percentage points, and a pro-Republican boost of 13 percentage points, in the 2014 election). In an unpublished expert report, Simon Jackman also used a model with fixed effects for states and years to analyze the impact of Democratic and Republican control on the efficiency gap in congressional elections from 1972 to 2016. He found that Democratic control produced a 3.4 percentage point swing in a Democratic direction, while Republican control produced a 5.5 percentage point swing in a Republican direction. *See* Simon Jackman, *Assessing the Current North Carolina Congressional Districting Plan* 32-38 (Mar. 1, 2017).

[13] *See* Bruce E. Cain et al., *Redistricting and Electoral Competitiveness in State Legislative Elections* 12 (Apr. 13, 2007); *see also* Vladimir Kogan & Eric McGhee, *Redistricting California: An Evaluation of the Citizens Commission Final Plans*, 4 CAL. J. POL. & POL'Y 1, 22-24 (2012) (finding that California's redistricting commission reduced its plans' partisan biases from about 5% to almost zero).

[14] *See* Nicholas O. Stephanopoulos, *Arizona and Anti-Reform*, 2015 U. CHI. LEGAL F. 477, 496-98.

[15] *See id.* at 498-501; *see also* Nicholas O. Stephanopoulos, *The Consequences of Consequentialist Criteria*, 3 U.C. IRVINE L. REV. 669, 710-11 (2013) (reporting similar results for the 1992-2012 period).

[16] *See* Thornburg v. Gingles, 478 U.S. 30 (1986) (setting forth the framework for establishing racial vote dilution under Section 2 of the Voting Rights Act).

efficiently across a map's remaining districts. These remaining districts may be both whiter and more Republican than if the minority-opportunity districts had not been drawn.[17]

However, greater minority representation may not *necessarily* lead to a Republican edge. This is because it is possible to craft minority-opportunity districts that do *not* waste inordinate numbers of Democratic votes. How? Simply by keeping these districts' proportions of minority voters (and Democrats) relatively low, and their shares of Republicans relatively high. Then it is Republicans, not Democrats, who waste more votes in the districts. Republican line-drawers, of course, have no incentive to enhance Democratic performance in this way; if they have to create minority-opportunity districts, they would prefer to pack them with minority voters (and Democrats). Democratic mapmakers, though, have every reason to employ this strategy, which lets them comply with the Voting Rights Act without compromising their partisan objectives. Accordingly, we might hypothesize that the relationship between minority representation and Republican advantage is strongest under unified Republican control of redistricting, weakest under unified Democratic control, and intermediate under other institutions.[18]

Regrettably, the existing literature has not probed this link; not a single study has considered how minority representation may affect partisan bias, the efficiency gap, or any other measure of partisan fairness. In the 1990s, however, scholars including David Canon, Kevin Hill, David Lublin, and Stephen Voss analyzed how the sharp increase in black representation in that decade influenced the share of legislative seats held by Democrats.[19] The conclusion of this work was that Democrats lost around ten congressional seats due to the creation of additional minority-opportunity districts,[20] as well as two to sixteen state house seats in each of ten southern states.[21] In an earlier article, I also used fixed effects models to assess how minority representation and Democratic seat share were related in state house elections from 1972 to 2014 under different configurations of control over redistricting.[22] I found that there was a tradeoff between minority representation and Democratic seat share, and that this tradeoff was exacerbated by unified Republican control but alleviated by unified Democratic control.[23]

A final concept that is regularly tied to partisan fairness in both academic and popular commentary is political geography.[24] Political geography can mean many things, but I use the term here to refer to the spatial distribution of Democratic and Republican voters. If one party's

---

[17] *See, e.g.*, Nicholas O. Stephanopoulos, *Race, Place, and Power*, 68 STAN. L. REV. 1323, 1384 (2016) (describing the potential tradeoff between descriptive and substantive representation in more detail).

[18] For similar hypotheses, see Adam B. Cox & Richard T. Holden, *Reconsidering Racial and Partisan Gerrymandering*, 78 U. CHI. L. REV. 553, 564-79 (2011); Stephanopoulos, *supra* note 17, at 1384-85.

[19] *See, e.g.*, DAVID T. CANON, RACE, REDISTRICTING, AND REPRESENTATION: THE UNINTENDED CONSEQUENCES OF BLACK MAJORITY DISTRICTS 74 (1999); DAVID LUBLIN, THE PARADOX OF REPRESENTATION: RACIAL GERRYMANDERING AND MINORITY INTERESTS IN CONGRESS 111 (1997); Kevin A. Hill, *Does the Creation of Majority Black Districts Aid Republicans?: An Analysis of the 1992 Congressional Elections in Eight Southern States*, 57 J. POL. 384, 398 (1995); David Lublin & D. Stephen Voss, *The Missing Middle: Why Median-Voter Theory Can't Save Democrats from Singing the Boll-Weevil Blues*, 65 J. POL. 227, 231, 233 (2003).

[20] *See* CANON, *supra* note 19, at 74, 257; LUBLIN, *supra* note 19, at 111-14.

[21] *See* Lublin & Voss, *supra* note 19, at 802 tbl.2.

[22] *See* Stephanopoulos, *supra* note 17, at 1388-89.

[23] *See id.* at 1389-93.

[24] For academic commentary, see the discussion in the next paragraph. For popular commentary, see BILL BISHOP, THE BIG SORT: WHY THE CLUSTERING OF LIKE-MINDED AMERICA IS TEARING US APART (2009).

supporters (say, Democrats in urban areas) are highly concentrated while the other party's backers (say, Republicans in suburban, exurban, and rural regions) are more evenly allocated, then it is possible that most district plans—even plans drawn without any partisan intent—will favor the more efficiently dispersed Republicans. These plans may "naturally" pack Democrats in a small number of urban districts where their preferred candidates win by enormous margins. The plans may also "naturally" crack Democrats among a large number of suburban, exurban, and rural districts where their candidates of choice lose relatively narrowly.

I place "naturally" in quotation marks in order to foreshadow another hypothesis: that political geography may have only a small and contingent relationship with partisan fairness. In any jurisdiction with more than a handful of seats, there is a near infinite number of ways in which the districts can be drawn. There is a near infinite number of ways, that is, in which voters can be spatially aggregated. Many of these configurations may produce a bias in favor of the more efficiently distributed party. But a substantial number may not—for instance, if districts tend to combine a slightly larger group of urban Democrats with a slightly smaller set of suburban, exurban, or rural Republicans. And as with minority representation, how political geography translates into partisan fairness may depend on the institution responsible for redistricting. Republicans may happily exploit spatial patterns by crafting many wholly urban (and heavily Democratic) districts. In contrast, Democrats may defy these patterns by designing more heterogeneous districts that merge urban and non-urban voters.[25]

Goedert is the only scholar who has included a measure of political geography—each state's level of urbanization—in a model of partisan fairness.[26] Relying on a pair of cross-sectional analyses, he found that more urbanized states had more pro-Republican efficiency gaps at the congressional level in 2012, but that this link disappeared in 2014.[27] Also worth noting here are the redistricting simulations carried out by Jowei Chen, David Cottrell, and Jonathan Rodden.[28] These authors used computer algorithms to generate large numbers of state legislative and congressional plans (with equal population, contiguity, and compactness as criteria), and then compared the parties' seat shares in the actual and simulated plans. At the state legislative level and using 2000 data, most (but not all) actual and simulated plans favored Republicans.[29] At the congressional level and using 2008 data, actual plans were about evenly divided between those that benefited Democrats and those that benefited Republicans relative to the simulated plans.[30]

---

[25] For good discussions of these line-drawing strategies, see Cox & Holden, *supra* note 18, and John N. Friedman & Richard T. Holden, *Optimal Gerrymandering: Sometimes Pack, but Never Crack*, 98 AM. ECON. REV. 113 (2008).

[26] *See* Goedert, *Disappearing Bias*, *supra* note 12, at 5; Goedert, *Gerrymandering or Geography?*, *supra* note 12, at 6.

[27] *See id.* Again, Goedert used a metric similar but not identical to the efficiency gap in his analysis.

[28] *See* Jowei Chen & David Cottrell, *Evaluating Partisan Gains from Congressional Gerrymandering: Using Computer Simulations to Estimate the Effect of Gerrymandering in the U.S. House*, 44 ELEC. STUD. 329 (2016); Jowei Chen & Jonathan Rodden, *Unintentional Gerrymandering: Political Geography and Electoral Bias in Legislatures*, 8 Q.J. POL. SCI. 239 (2013).

[29] *See* Chen & Rodden, *supra* note 28, at 263.

[30] *See* Chen & Cottrell, *supra* note 28, at 335, 337.

Shifting gears from the causes to the consequences of partisan gerrymandering, a simple logical chain connects it to distorted representation—that is, representation out of kilter with the views of the electorate. Take a state whose voters are closely divided in both partisan and ideological terms. Next assume that a severe pro-Democratic (pro-Republican) gerrymander is in place, resulting in the election of significantly more Democrats (Republicans) than would have won office under a neutral plan. Posit further that Democratic and Republican legislators differ in their voting records and ideologies, with Democrats being more liberal and Republicans being more conservative.[31] The necessary conclusion is that under the pro-Democratic (pro-Republican) gerrymander, the state legislature or congressional delegation is more liberal (conservative) than it would have been under a neutral map. Likewise, the legislature or delegation is more liberal (conservative) than the state's closely divided electorate.

In a forthcoming article, Chris Tausanovitch and Christopher Warshaw assess exactly this claim at the state house level. Using a fixed effects model for elections from 1992 to 2012, they find that a one standard deviation pro-Democratic (pro-Republican) shift in the efficiency gap led to about a 0.4 standard deviation pro-liberal (pro-conservative) shift in the ideology of the median state house member.[32] Intriguingly, Tausanovitch and Warshaw extend this analysis from representation to actual policy outcomes. They show that a one standard deviation pro-Democratic (pro-Republican) shift in the efficiency gap also pushed a state's overall set of policies by 2.4 percentage points in a liberal (conservative) direction.[33] By comparison, this is about twice the impact of switching the governor from one party to the other.[34]

To recap, redistricting theory and available scholarship support four hypotheses about the explanations and implications of district plans' partisan fairness. *First*, that unified control of the line-drawing process predictably benefits the party in charge, while other institutions have small and erratic partisan effects. *Second*, that greater minority representation leads to a Republican advantage, except perhaps when Democrats are responsible for redistricting. *Third*, that greater urbanization also favors Republicans, also except maybe when Democrats draw the lines. And *fourth*, that maps' partisan tilt is a significant driver of their representational skew. In the balance of the Article, I test these hypotheses using nearly fifty years of data at both the state house and congressional levels.

II. DATA AND METHODS

The principal datasets on which I rely are of the efficiency gap by state and year in state house and congressional elections. At the state house level, there are 786 observations from 207 district plans and 41 states, spanning elections from 1972 to 2014. At the congressional level, there are 512 observations from 136 plans and 25 states (all with at least 7 seats), spanning

---

[31] This assumption has become increasingly accurate over the last few decades. *See The Polarization of the Congressional Parties*, VOTEVIEW.ORG (Jan. 30, 2016), http://voteview.org/political_polarization_2015.htm (showing the rising polarization of members of Congress); Boris Shor & Nolan McCarty, *The Ideological Mapping of American Legislatures*, 105 AM. POL. SCI. REV. 530 (2011) (same for state legislatures).

[32] *See* Chris Tausanovitch & Christopher Warshaw, *The Efficiency Gap: Implications for Representation in Legislative Positions and State Policy*, 16 ELECTION L.J. (forthcoming 2017) (manuscript at 12).

[33] *See id.* (manuscript at 14).

[34] *See id.*

elections from 1972 to 2016.[35] These scores are computed using actual election results whenever districts were contested by both major parties, and using imputations whenever races did not feature two major-party candidates.[36] Negative values indicate a Republican advantage (that is, more Democratic than Republican wasted votes); positive values denote a Democratic edge. As noted earlier, at both the state house and congressional levels, the historical distribution of the efficiency gap is normal and centered very close to zero.[37] At both levels, the efficiency gap has also trended in a Republican direction over the last three redistricting cycles.[38]

With respect to the potential causes of district plans' partisan skews, I compiled data on most of them in previous work. The institution responsible for redistricting is coded by plan using five dummy variables: unified Democratic control, unified Republican control, court, commission, or divided government.[39] Minority representation is coded using the shares of state house or congressional seats held by African American or Latino legislators.[40] And consistent with Goedert's analysis, I rely on each state's level of urbanization as a proxy for political geography.[41] Urbanization does not directly capture the spatial distribution of Democratic or Republican voters, but unfortunately, there is no currently available and time-variant measure that does.

With respect to the representational consequences of district plans' partisan tilts, I code House members' ideologies using the DW-Nominate scores developed by Keith Poole and Howard Rosenthal.[42] These scores are derived from House members' roll call voting records, and capture on a single left-right axis the members' "ideal points"—that is, the "unique set[s] of policies that they 'prefer' to all others."[43] The scores range from roughly -1 (very liberal) to +1 (very conservative); as a point of calibration, the House median in the most recent session for

[35] These scores were calculated by Simon Jackman. *See* Simon Jackman, *Assessing the Current Wisconsin State Legislative Districting Plan* 20 (July 7, 2015) [hereinafter Jackman, *Wisconsin Report*]; Simon Jackman, *Assessing the Current North Carolina Congressional Districting Plan* 20 (Mar. 1, 2017) [hereinafter Jackman, *North Carolina Report*].

[36] *See* Jackman, *North Carolina Report*, *supra* note 35, at 21-27; Jackman, *Wisconsin Report*, *supra* note 35, at 24-31.

[37] *See* Jackman, *North Carolina Report*, *supra* note 35, at 28; Jackman, *Wisconsin Report*, *supra* note 35, at 7.

[38] *See* Jackman, *North Carolina Report*, *supra* note 35, at 30; Jackman, *Wisconsin Report*, *supra* note 35, at 45.

[39] *See* Stephanopoulos, *supra* note 14, at 497; Stephanopoulos, *supra* note 17, at 1388-89.

[40] *See* Stephanopoulos, *supra* note 17, at 1367. I note that these seat shares are not identical to the proportions of minority-opportunity *districts*. The two measures are very highly correlated, though. *See* Stephanopoulos, *supra* note 17, at 1362.

[41] *See* Goedert, *Disappearing Bias*, *supra* note 12, at 5; Goedert, *Gerrymandering or Geography?*, *supra* note 12, at 6; *see also 2010 Census Urban and Rural Classification and Urban Areas Criteria*, U.S. CENSUS BUREAU, https://www.census.gov/geo/reference/ua/urban-rural-2010.html (last visited Mar. 15, 2017) [hereinafter *Census Urbanization Data*].

[42] *See DW-NOMINATE Scores With Bootstrapped Standard Errors*, VOTEVIEW.ORG (Sept. 17, 2015), http://www.voteview.com/dwnomin.htm.

[43] Chris Tausanovitch & Christopher Warshaw, *Measuring Constituent Policy Preferences in Congress, State Legislatures, and Cities*, 75 J. POL. 330, 331 (2013).

which data is available (2013-2014) was about 0.5.[44] (I do not examine *state legislators'* ideologies because Tausanovitch and Warshaw have already done so quite thoroughly.[45])

In the main analysis, I regress the efficiency gap on the five dummy variables for the institution responsible for redistricting,[46] black and Latino seat share, and urbanization. I also include controls for the Democratic share of the statewide vote (to take into account the overall electoral environment) and the number of seats in the plan (due to the efficiency gap's greater "lumpiness" as the number of seats declines). I further include fixed effects for states and years, and cluster standard errors by plan.[47] The state-year fixed effects represent a rigorous methodological choice for panel data. They control for any time trends as well as for any fixed differences among states due to politics, economics, demography, culture, or other factors.[48]

In a series of robustness checks, I replace state fixed effects with state random effects; add a control for the lagged efficiency gap (that is, the efficiency gap in the previous election); and change the dependent variable to partisan bias.[49] To further probe the impact of control of the redistricting process, I also use a technique known as nearest-neighbor matching.[50] This method identifies observations that are as similar as possible in terms of a series of covariates (Democratic share of the statewide vote, black seat share, and urbanization)—but that *differ* in the institution responsible for redistricting.[51] The method yields a "treatment effect" that corresponds to the change in the efficiency gap that occurs when observations are "treated" with a particular redistricting institution. Additionally, to determine whether the influence of black seat share or urbanization varies by party, I run two more models with interactions between these variables, respectively, and unified Democratic and Republican control of redistricting.[52]

The final model I specify addresses the representational implications of district plans' partisan skews. The dependent variable is the median DW-Nominate score of the members of each House delegation. The independent variables are the efficiency gap and the Democratic share of the statewide vote. I again include fixed effects for states and years, and cluster standard

---

[44] I note that I use only the first-dimension DW-Nominate scores in this analysis.

[45] *See* Tausanovitch & Warshaw, *supra* note 32.

[46] Divided government is the omitted variable.

[47] For a similar efficiency gap analysis also including state-year fixed effects and clustering standard errors by plan, see Jackman, *North Carolina Report*, *supra* note 35, at 34.

[48] For a good discussion (and application) of fixed effects regression, see Eric M. McGhee et al., *A Primary Cause of Partisanship? Nomination Systems and Legislator Ideology*, 58 AM. J. POL. SCI. 337, 343 (2014).

[49] For similar robustness checks, see Stephanopoulos, *supra* note 17, at 1360, 1376, 1391; and Tausanovitch & Warshaw, *supra* note 32 (manuscript at 12, 14). Because partisan bias becomes less reliable in less competitive electoral settings, *see* Stephanopoulos & McGhee, *supra* note 1, at 855-62, when I use it as the dependent variable I only consider cases where the statewide vote was closer than 55% to 45%.

[50] For a useful discussion, see Alberto Abadie & Guido W. Imbens, *Bias-Corrected Matching Estimators for Average Treatment Effects*, 29 J. BUS. & ECON. STAT. 1 (2011). Per Abadie and Imbens's recommendation, I use the bias-adjustment estimator when conducting the nearest-neighbor matching.

[51] I define the "control" group for each "treatment" as follows: for unified Democratic control, all plans except those under unified Republican control; for unified Republican control, all plans except those under unified Democratic control; and for court usage, commission usage, and divided government, all plans except those under unified Democratic or Republican control. In other words, the control group never includes plans enacted under single-party rule. I also do not include Latino seat share as a covariate due to insufficient variation and to reduce the number of factors that must be matched.

[52] For a similar analysis, see Stephanopoulos, *supra* note 17, at 1388-89.

errors by state. And to establish robustness, I add a control for the lagged median DW-Nominate score; replace the median with the average DW-Nominate score; and replace the efficiency gap with partisan bias.

III. RESULTS

A. Main Analysis

Beginning with the main analysis, Tables 1 and 2 in the Appendix display the results of the state house and congressional models, respectively.[53] In both models, unified Democratic control of redistricting is statistically significant and associated with a pro-Democratic shift in the efficiency gap of 3 to 3.5 percentage points.[54] Unified Republican control is also statistically significant, but interestingly, its impact is about twice as large at the congressional level (about -4.5 percentage points) as at the state house level (roughly -2 percentage points). Neither commission usage nor court usage rises to statistical significance in the state house model; in the congressional model, commission usage again fails to do so, but court usage results in a pro-Democratic shift in the efficiency gap of about 3 percentage points.

Turning to minority representation, there is a negative and statistically significant relationship between black seat share and the efficiency gap at both the state house and congressional levels. That is, as black legislators win more seats, the efficiency gap moves in a Republican direction. There is no such relationship, however, between Latino seat share and the efficiency gap in either state house or congressional elections. Lastly, urbanization is negatively and significantly linked to the efficiency gap at the state house level but not at the congressional level. It is thus only at the former level that Republicans perform better in more urbanized states (and Democrats enjoy an edge in more rural ones).

To make these results more concrete, Figure 1 shows the impact on the efficiency gap of adopting a particular redistricting institution and of increasing each of the continuous variables (black seat share, Latino seat share, and urbanization) by one standard deviation.[55] (The left panel is for state houses; the right panel is for congressional delegations.) A few points stand out from the charts. First, the efficiency gap effects are generally larger at the congressional level than at the state house level. This is likely because congressional delegations typically have fewer seats than state houses, meaning that each congressional seat that changes hands represents a more sizable gain or loss in percentage point terms. Second, the confidence interval for commission usage at the congressional level is larger than for any other redistricting institution. The probable explanation is that not many observations involve congressional plans designed by commissions (only 37 out of 512), and a few of these plans exhibited highly variable efficiency gaps.

---

[53] *See infra* app. tbls.1-2.

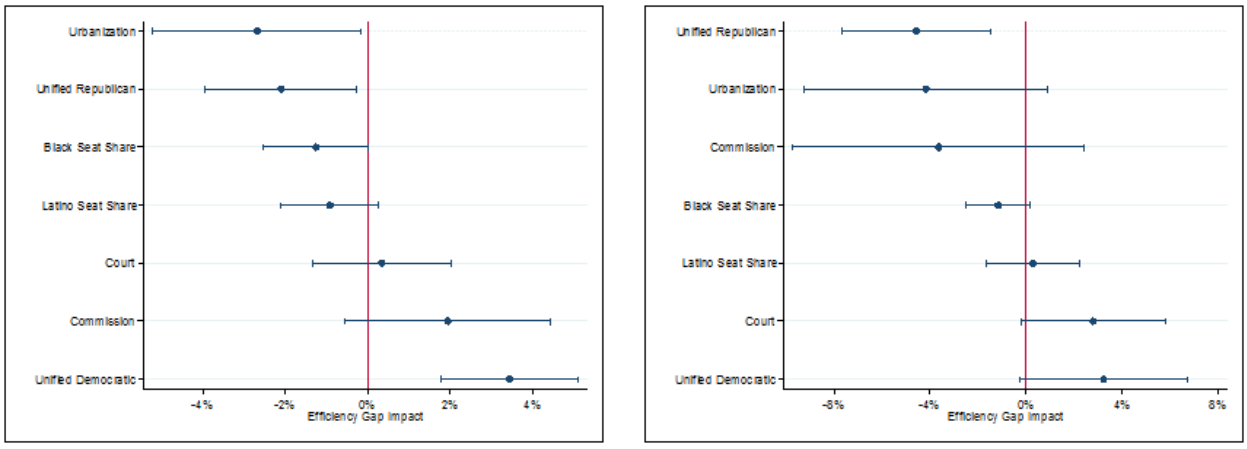
[54] Again, divided government is the omitted variable. The coefficients therefore represent the impact of adopting a particular redistricting institution relative to the benchmark of divided government.

[55] For the sake of simplicity, I omit the control variables (the Democratic share of the statewide vote and the number of seats in each plan) from the figure.

Third, the substantive impact of increasing black seat share by one standard deviation is quite small: only about a 1 percentage point shift in the efficiency gap in a Republican direction. Thus even though the negative relationship between black seat share and the efficiency gap is statistically significant, it is not particularly meaningful in practical terms. And fourth, in contrast, the substantive impact of increasing urbanization by one standard deviation is considerable—roughly equivalent to switching from divided government to unified Republican control of redistricting. However, the confidence interval for urbanization is also large, especially at the congressional level, and explains why the variable fails to attain statistical significance in that model despite its seemingly sizable effect.

These results are mostly confirmed by the robustness checks.[56] Unified Democratic control remains statistically significant in all of the alternative state house models and in all but one of the alternative congressional models. Unified Republican control stays statistically significant in every other model permutation. Commission usage fails to attain significance in every state house model and in all but one congressional model. Court usage remains statistically insignificant in every state house model, and significant in one additional congressional model. Black seat share continues to have a negative and statistically significant relationship with the efficiency gap in four of the six alternative models. Latino seat share never exhibits a significant relationship. And urbanization remains a statistically significant driver of the efficiency gap in two of the other three state house models, while it remains insignificant in all of the other congressional models. We can conclude, then, that the outcomes of the main analysis are strongly corroborated by the additional testing.

FIGURE 1: EFFICIENCY GAP IMPACTS FROM REGRESSION ANALYSIS



The left panel is for state house elections; the right panel is for congressional elections. The point estimates represent the impact on the efficiency gap of adopting a particular redistricting institution or increasing a continuous variable by one standard deviation. The bars to the left and right of the point estimates denote 95% confidence intervals.

[56] These checks are also displayed in Tables 1 and 2 in the Appendix. *See infra* app. tbls.1-2.

B. *Nearest-Neighbor Matching*

I turn next to the nearest-neighbor matching, which further illuminates how different redistricting institutions affect the efficiency gap. (The technique can be used only for categorical variables, and so is inapplicable to the continuous variables in the preceding analysis.) Figure 2 depicts the efficiency gap impact of "treating" an observation with a particular institution—that is, comparing that observation to another entry that is as similar as possible in terms of several covariates, but that differs in the author of its district plan.[57] Again, the left panel is for state houses, while the right panel is for congressional delegations. Because there is some evidence that unified control of redistricting has become more potent in recent years,[58] the charts include separate estimates for the entire modern period, the 1970s and 1980s cycles, and the cycles from the 1990s to the present.

Starting with unified Democratic control, its treatment effect has been fairly constant at the state house level, varying only modestly between the 1972-1990 period (6.0%) and the 1992-2014 period (4.3%). At the congressional level, in contrast, the impact of unified Democratic control on the efficiency gap rose dramatically between the 1970s and 1980s (1.6%) and the 1990s, 2000s, and 2010s (7.9%). Next, the treatment effect of unified Republican control nearly doubled at the state house level from the earlier period (-3.3%) to the later one (-5.4%). And its impact more than doubled at the congressional level (-3.8% to -10.5%).

With respect to redistricting commissions, their treatment effect was substantively small and statistically indistinguishable from zero at all times in state house elections. In congressional elections, their impact was larger but still statistically insignificant. Courts present a more mixed picture. For the entire modern period, the efficiency gap impact of a court-drawn plan was close to zero at the state house level but reasonably pro-Democratic at the congressional level (3.2%). At both levels, the impact of a court-drawn plan became somewhat more pro-Republican over time. Lastly, the treatment effect of divided government was consistently near zero and statistically insignificant in state house elections. But in congressional elections, its impact was quite pro-Republican (-5.3%), albeit less so over the last three cycles (-2.5%).

It is important to note that these results cannot be compared directly to the outputs of the earlier regression analysis. The benchmark for comparison is different: divided government in the regression analysis,[59] as opposed to a control group of all other observations not under single-party rule here.[60] The regression analysis also includes several controls absent here: Latino seat share, the number of seats in each plan, as well as the state and year fixed effects.

---

[57] The makeup of the "control" group for each redistricting institution is described above. *See supra* note 51. However, the results are not appreciably different if *all* other observations are used as the control group. Nor do the results materially vary if the covariates are amended to include Latino seat share, black population share, Latino population share, the number of seats in a plan, and/or the election year. And no treatment effect is shown for commissions at the congressional level between 1972 and 1990 because none were used in this period (for cases in my database).

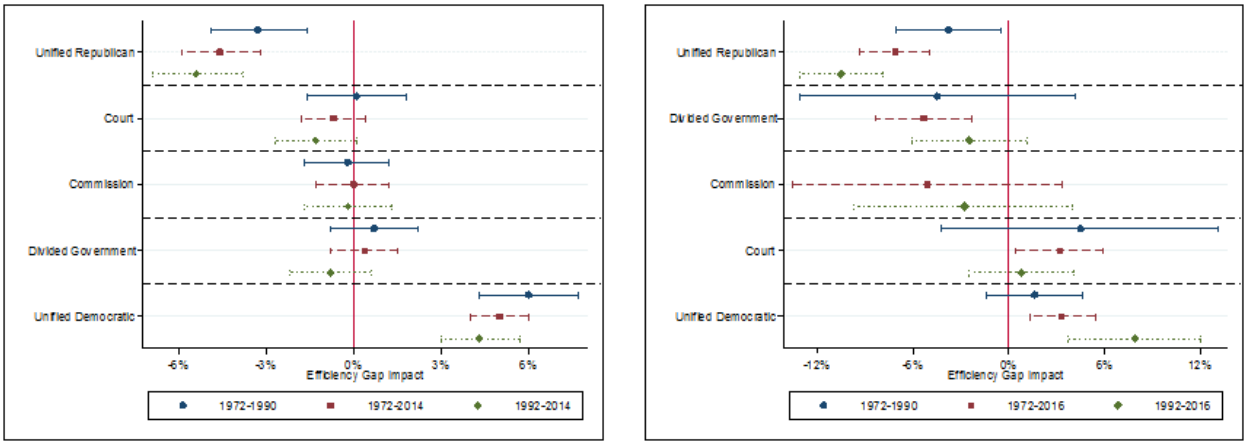
[58] *See* Jackman, *North Carolina Report*, *supra* note 35, at 34 (finding that unified Democratic control has its largest impact on the efficiency gap from 2002 to 2016, and that unified Republican control has its largest impact from 1992 to 2016).

[59] *See supra* note 46.

[60] *See supra* note 51.

Nevertheless, the consistency of the two techniques' outcomes is striking. In both cases, unified control of the state government consistently and sizably benefits the party in charge. In both cases, other redistricting institutions also tend to have small and uneven effects on the efficiency gap. The nearest-neighbor matching therefore adds detail to the portrait already painted—in particular, by showing how the impact of unified control has grown in recent years. But it does not unsettle any of the prior conclusions.

FIGURE 2: EFFICIENCY GAP IMPACTS FROM NEAREST-NEIGHBOR MATCHING



The left panel is for state house elections; the right panel is for congressional elections. The point estimates represent the "treatment effect" of adopting a particular redistricting institution, relative to a control group of other observations not under single-party rule. The bars to the left and right of the point estimates denote 95% confidence intervals.

C. *Interactive Analysis*

The next analysis investigates whether the influence of black seat share and urbanization on the efficiency gap varies based on the party responsible for redistricting. Table 3 in the Appendix displays the results of state house and congressional models identical to those presented earlier—except that they now include interactions between unified Democratic control and black seat share and between unified Republican control and black seat share.[61] Using these models, Figure 3 shows predicted efficiency gap values for different black seat shares in state houses and congressional delegations, under conditions of unified Democratic control, unified Republican control, and non-unified control.[62] All other variables are held constant at their means. As before, the left panel is for state houses, while the right panel is for congressional delegations.

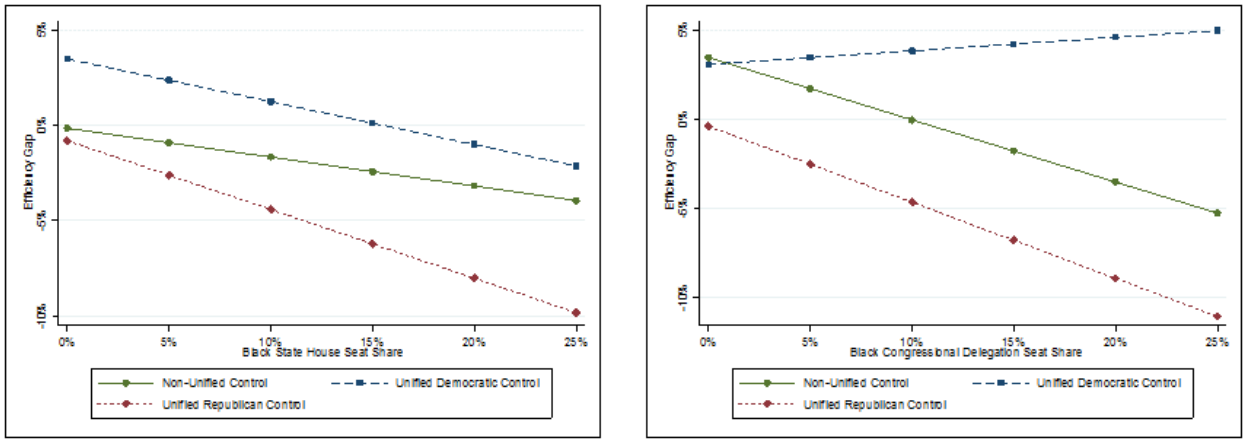
When neither party is solely responsible for redistricting, there is a negative relationship (statistically significant only in the congressional model) between black seat share and the efficiency gap. As black seat share increases from 0% to 15% (about a standard deviation above its mean), the efficiency gap declines from roughly 0% to -2% in the state house model, and

[61] *See infra* app. tbl.3. I do not carry out this analysis for *Latino* seat share since there is no indication that it significantly affects the efficiency gap.

[62] I show black seat share up to approximately its 95th percentile, or 25%.

from roughly 3% to -2% in the congressional model. This negative relationship is amplified by unified Republican control. Under this configuration, as black seat share rises from 0% to 15%, the efficiency gap falls from about -1% to -6% in the state house model, and from about 0% to -7% in the congressional model. Unified Democratic control, on the other hand, transforms the relationship. At the state house level, it raises the efficiency gap at all levels of black seat share, so that as black seat share grows from 0% to 15%, the efficiency gap only drops from roughly 3% to 0%. And at the congressional level, unified Democratic control *reverses* the link, so that the efficiency gap *rises* from 3% to 4% as black seat share goes from 0% to 15%.

FIGURE 3: PREDICTED EFFICIENCY GAPS FOR DIFFERENT BLACK SEAT SHARES



The left panel is for state house elections; the right panel is for congressional elections. Predicted efficiency gaps are shown separately for the scenarios of unified Democratic control, unified Republican control, and non-unified control. Black seat share varies from 0% to 25%; all other variables are held constant at their means.

Table 4 in the Appendix repeats this analysis, only this time with urbanization interacted with unified Democratic control and unified Republican control.[63] Figure 4 depicts predicted efficiency gap values for different levels of urbanization in state houses and congressional delegations, under conditions of unified Democratic control, unified Republican control, and non-unified control.[64] Again, all other variables are held constant at their means, the left panel is for state houses, and the right panel is for congressional delegations.

When neither party has full line-drawing authority, there is a negative and statistically significant relationship between urbanization and the efficiency gap. As urbanization increases from 60% to 80% (or about a standard deviation below to a standard deviation above its mean), the efficiency gap declines from roughly 2% to -3% in the state house model, and from roughly 10% to -2% in the congressional model. This negative relationship becomes somewhat (though not statistically significantly) stronger under unified Republican control. Under this configuration, as urbanization rises from 60% to 80%, the efficiency gap falls from about -1% to -5% in the state house model, and from about 6% to -6% in the congressional model. The relationship is also alleviated only modestly (and not statistically significantly) by unified

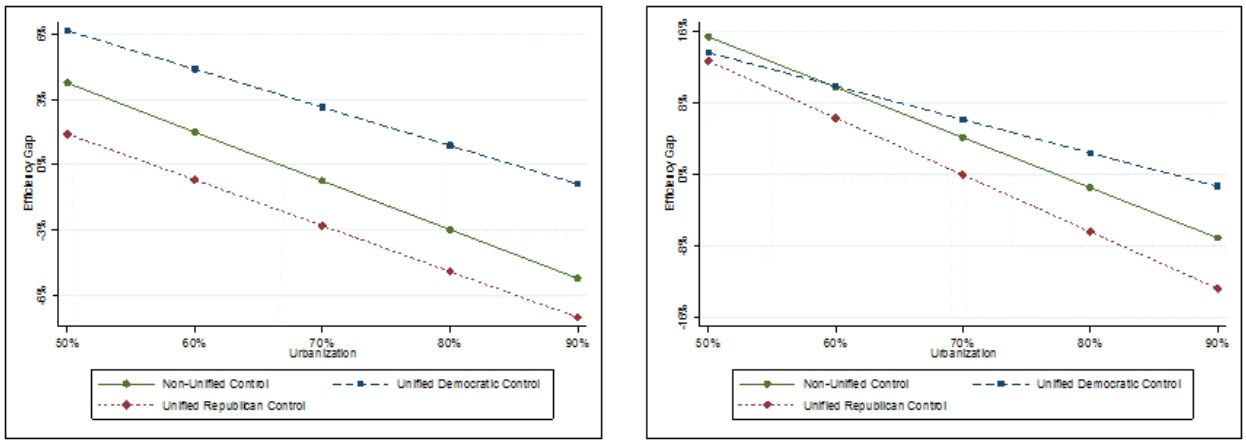
[63] *See infra* app. tbl.4.
[64] I show urbanization from roughly its 10th percentile (50%) to its 90th percentile (90%).

Democratic control. With Democrats in charge of redistricting, as urbanization grows from 60% to 80%, the efficiency gap drops from roughly 4% to 1% in the state house model, and from roughly 10% to 2% in the congressional model.

There is an interesting difference, then, in how black seat share and urbanization interact with party control. Both parties are able to manipulate the link between black seat share and the efficiency gap—Republicans by tilting plans further in their favor as black representation increases, Democrats by negating the connection between black representation and partisan fairness altogether. In contrast, neither party has the capacity to sway substantially the relationship between urbanization and the efficiency gap. This relationship does shift in each party's direction when it is solely responsible for redistricting, but not to the point of statistical significance.

What accounts for this contrast? A likely explanation is that black seat share is a more *malleable* variable than urbanization. In other words, it is easier for each party to achieve a certain level of black representation *and* an efficiency gap that benefits it. Democrats simply create black-opportunity districts that elect black-preferred candidates by relatively slim margins; Republicans simply craft such districts that propel such candidates to overwhelming victories. Urbanization, on the other hand, may be harder for the parties to finesse. In a highly urbanized state, for example, Democrats may have little choice but to design numerous heavily Democratic districts in the urban core. In a more rural state, similarly, Republicans may be constrained in cracking or packing Democratic voters who are dispersed relatively evenly. This is not to say, of course, that urbanization is destiny for purposes of partisan fairness. The point is only that the natural pull of urbanization may be more difficult for the parties to resist than that of black representation.

FIGURE 4: PREDICTED EFFICIENCY GAPS FOR DIFFERENT LEVELS OF URBANIZATION



The left panel is for state house elections; the right panel is for congressional elections. Predicted efficiency gaps are shown separately for the scenarios of unified Democratic control, unified Republican control, and non-unified control. Urbanization varies from 50% to 90%; all other variables are held constant at their means.

D. *Representational Analysis*

The final analysis considers the representational implications—not the causes—of district plans' partisan tilts. Before getting to the regression results, Figure 5 plots the median DW-Nominate score of each congressional delegation versus the Democratic share of the statewide vote.[65] Separate lowess curves are included for plans with large Democratic efficiency gaps (greater than 10%), large Republican efficiency gaps (less than -10%), and intermediate efficiency gaps (between -10% and 10%). About one-tenth of plans have efficiency gaps greater than 10%, and roughly another one-tenth have efficiency gaps less than -10%, rendering this a logical cutoff.[66]

Figure 5 is notable in at least two respects. First, and most importantly, for values of the Democratic share of the statewide vote near 50%, there are dramatic differences in the median DW-Nominate score among plans with pro-Democratic, pro-Republican, and intermediate efficiency gaps. At the 50% point, for instance, a plan with a pro-Democratic efficiency gap typically has a median DW-Nominate score around -0.2, a plan with an intermediate efficiency gap typically has a DW-Nominate median around 0, and a plan with a pro-Republican efficiency gap typically has a DW-Nominate median around 0.4. This means that switching from a pro-Democratic to a pro-Republican plan—while keeping constant the partisan preferences of the electorate—shifts the DW-Nominate median by about 0.6, or roughly 2 standard deviations, in a conservative direction. This is plainly a very large effect.

Second, this effect stays similarly large for Democratic vote shares well below 50%, but it mostly evaporates for Democratic vote shares well above 50%. In fact, as the Democratic vote share approaches 60%, the median DW-Nominate score is almost the same whether a plan has a pro-Democratic, a pro-Republican, or an intermediate efficiency gap. This indicates that when either party has the advantage in a heavily Democratic state, the additional members it elects are not ideologically extreme. Conversely, in a heavily Republican state, extra Democrats (elected under a pro-Democratic plan) are quite liberal, while extra Republicans (elected under a pro-Republican) plan are very conservative.

Figure 5 suggests that pro-Democratic (pro-Republican) efficiency gaps are associated with more liberal (more conservative) congressional delegations, even holding constant states' electoral environments. The model reported in Table 5 in the Appendix confirms this expectation.[67] The coefficient for the efficiency gap is statistically significant and substantively large, controlling for the Democratic share of the statewide vote and including state and year fixed effects. In fact, a shift in the efficiency gap from 10% to -10% yields a shift in the median DW-Nominate score of about 0.3, or roughly 0.8 standard deviations, in a conservative direction. Thus even when a host of additional variables are considered, the impact of the efficiency gap on congressional representation remains almost as impressive as in the initial correlational analysis.

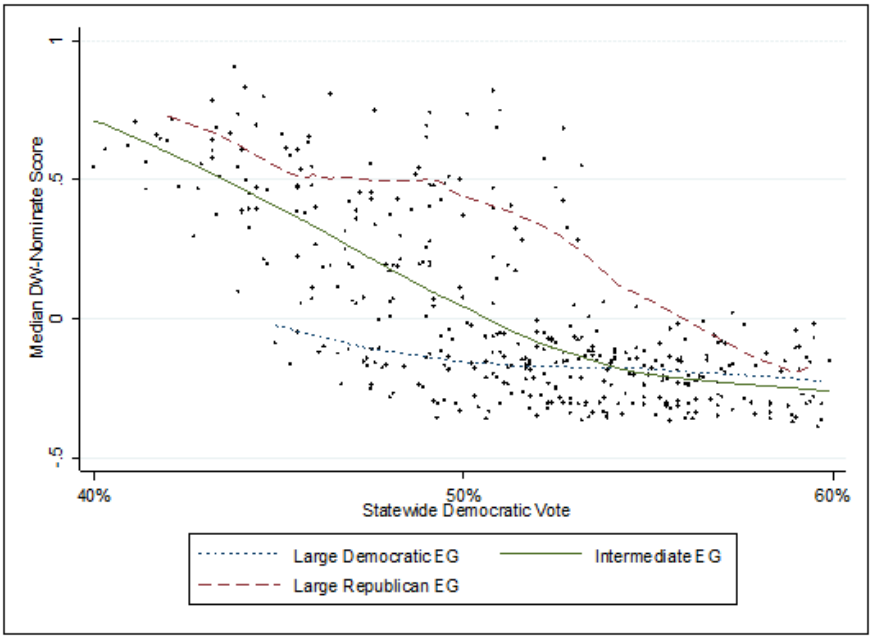
[65] For the sake of symmetry, I truncate the Democratic share of the statewide vote at 40% and 60%. This captures about 90% of observations.

[66] *Cf.* Connor v. Finch, 431 U.S. 407, 418 (1977) (declaring that "'under 10%' [population] deviations . . . [are] of prima facie constitutional validity").

[67] *See infra* app. tbl.5.

This conclusion is bolstered by the robustness checks also reported in Table 5.[68] The coefficient for the efficiency gap stays statistically significant—and substantively large—when a control is added for the lagged DW-Nominate median and when the dependent variable is switched from the median to the average DW-Nominate score of each congressional delegation.[69] Even when the efficiency gap is replaced as an independent variable by partisan bias, the coefficient for the latter is statistically significant and substantively large as well. We can therefore be highly confident that district plans' partisan skews indeed have representational consequences. Pro-Democratic plans make House delegations markedly more liberal; pro-Republican plans do the same but in the opposite direction.

FIGURE 5: MEDIAN DW-NOMINATE SCORE VERSUS STATEWIDE DEMOCRATIC VOTE SHARE



Scatter plot of congressional delegations' median DW-Nominate scores versus states' Democratic vote shares in the preceding congressional election. Separate lowess curves are plotted for plans with large Democratic efficiency gaps (greater than 10%), large Republican efficiency gaps (less than -10%), and intermediate efficiency gaps (between -10% and 10%).

IV. IMPLICATIONS

The above findings can be distilled into a series of stylized facts about the causes and consequences of gerrymandering. *First*, unified control of the redistricting process significantly benefits the party in charge—indeed, to a greater extent than any other variable. *Second*, other redistricting institutions do not sizably or consistently advantage either party. *Third*, greater

[68] *See infra* app. tbl.5.

[69] Specifically, a shift in the efficiency gap from 10% to -10% yields a shift in the average DW-Nominate score of about 0.13, or roughly 0.0037 standard deviations, in a conservative direction. The DW-Nominate average has a smaller standard deviation than the DW-Nominate median (0.2 versus 0.3), likely because in a polarized Congress, flipped seats can sometimes drastically change the delegation median while only somewhat shifting its mean.

black representation (but not greater Latino representation) leads to slightly larger pro-Republican skews (but not when Democrats are responsible for redistricting). *Fourth*, greater urbanization yields modestly larger pro-Republican tilts, and this effect is mostly unmediated by partisan control. And *fifth*, the partisan fairness of congressional plans dramatically influences the representational distortion of House delegations.

What do these facts mean for scholars, courts, and reformers? Starting with scholars, the results confirm the conclusions of two bodies of existing work. One of these bodies has found, using simple comparisons and cross-sectional analyses, that unified control of the redistricting process considerably benefits the party in charge.[70] This finding turns out to hold even when far more data—and far more rigorous techniques—are employed in the analysis.[71] The other strand in the literature is Tausanovitch and Warshaw's study showing that large efficiency gaps substantially shift state houses' ideological midpoints as well as states' enacted policies.[72] At least with respect to representation, the same is true at the congressional level: pro-Democratic (pro-Republican) efficiency gaps strongly push House delegations' median ideal points to the left (right).[73]

On the other hand, the results tend to undercut earlier work that has stressed the pro-Republican implications of minority representation[74] and political geography.[75] As to minority representation, the shares of state house and congressional seats held by America's largest minority group, Latinos, have no effect at all on the efficiency gap. Greater black representation does shift the efficiency gap in a Republican direction—but only marginally, by about 1 percentage point when black seat share increases by a full standard deviation. And even this small swing disappears when Democrats are responsible for redistricting.[76] Likewise, as to political geography, urbanization has a statistically significant and pro-Republican impact at the state house level but *not* at the congressional level. Even at the state house level, a rise in urbanization of one standard deviation pushes the efficiency gap by only about 3 percentage points in a Republican direction. And such a rise, of course, is highly unrealistic in any reasonable timeframe; the average state's level of urbanization changes by only about 2 percentage points (or one-seventh of a standard deviation) per *decade*.[77]

Beyond challenging the conventional wisdom in certain respects, and validating it in others, the results suggest several promising avenues for future research. First, it would be worthwhile to find out if the same conclusions hold for *other* measures of partisan fairness.[78] I substituted partisan bias for the efficiency gap as a robustness check in each set of models, and determined that this substitution made little substantive difference. But I did not subject partisan

[70] *See supra* notes 9-12 and accompanying text. Note also that Gelman and King used a multiyear model with state fixed effects in their analysis. *See* Gelman & King, *supra* note 2, at 550.

[71] *See supra* Parts III.A-B.

[72] *See* Tausanovitch & Warshaw, *supra* note 32.

[73] *See supra* Part III.D.

[74] *See supra* notes 19-21 and accompanying text.

[75] *See supra* notes 26-30 and accompanying text.

[76] *See supra* Parts III.A, III.C.

[77] *See supra* Parts III.A, III.C; *see also Census Urbanization Data*, *supra* note 41.

[78] *See supra* note 7 and accompanying text.

bias to the same array of tests as the efficiency gap, and I did not analyze other partisan fairness metrics at all.

Second, it would be advisable to incorporate states' redistricting criteria—compactness, respect for political subdivisions, respect for communities of interest, and so on—into the models, as well as data on how closely these criteria are actually heeded. Most states must abide by at least some line-drawing requirements, and both the existence and the extent of compliance with these rules may affect plans' partisan fairness.[79] And third, as I mentioned earlier, urbanization is a suboptimal proxy for political geography because it does not directly capture the spatial distribution of Democratic or Republican voters.[80] Better metrics *do* exist, like the isolation index (for the average party member living in a given geographic unit, what share of her neighbors in the unit belong to the same party) and global Moran's I (a measure of spatial autocorrelation indicating the degree to which Democrats or Republicans are geographically clustered).[81] However, these metrics have not yet been computed for many states over many years because the necessary geocoded, precinct-level election results have not been available. If and when this data does become accessible, it may shed more light on how political geography and partisan fairness are intertwined.

Turning from scholars to courts, one of the main arguments advanced by states sued for partisan gerrymandering is that their plans' partisan skews are the product of political geography and compliance with the Voting Rights Act—not partisan intent. In *Whitford v. Gill*, for example, Wisconsin claimed (and a dissenting judge agreed) that "urban, more Democratic, voters are more closely packed together than suburbanites and farmsteaders, who lean more Republican but who are interspersed with lots of Democrats nonetheless."[82] "Wisconsin's political geography" therefore allegedly "result[ed] in hundreds of thousands of 'wasted' votes in inevitable landslide Democratic victories."[83] Similarly, Wisconsin (and the dissenting judge) stressed that many "heavily Democratic inner-city wards in Milwaukee" that were "between 93% and 95% Black" were placed in districts that were drawn "with an eye to Voting Rights Act concerns."[84] The VRA thus "naturally packed Democratic voters in Milwaukee."[85]

This Article's findings help to rebut such assertions. As to political geography, not only is the impact of urbanization on the efficiency gap comparatively modest, but Wisconsin is not even an especially urbanized state. In fact, it is somewhat *less* urbanized than the average state,

---

[79] For a first pass at this sort of analysis, see Stephanopoulos, *supra* note 15, at 710-11 (including several redistricting criteria in partisan fairness models covering only the 1992-2012 period and lacking fixed effects). *See also generally* JONATHAN WINBURN, THE REALITIES OF REDISTRICTING: FOLLOWING THE RULES AND LIMITING GERRYMANDERING IN STATE LEGISLATIVE REDISTRICTING (2008) (arguing that state requirements that political subdivisions be respected reduced gerrymandering in the 2000 cycle).

[80] *See supra* note 24 and accompanying text.

[81] *See* Kenneth R. Mayer, *Rebuttal Report: Response to Expert Reports of Sean Trende and Nicholas Goedert* 16-18 (Mar. 31, 2016) (using both of these metrics to analyze the geographic distribution of Democrats and Republicans in Wisconsin).

[82] 2016 WL 6837229, at *96 (Griesbach, J., dissenting).

[83] *Id.* at *73.

[84] *Id.* at *93 n.16, *95 & n.18.

[85] *Id.* at *93.

meaning that its political geography mildly favors *Democrats* relative to the national mean.[86] As to VRA compliance, analogously, if greater black representation slightly benefits Republicans in Wisconsin, it does so only because Republicans drew the district lines. There would likely be no connection between black seat share and partisan fairness if Democrats had been responsible for redistricting. Moreover, only 3% of Wisconsin's state house seats are represented by African Americans.[87] At this low level of black representation (relative to the country as a whole), the variable actually advantages *Democrats* regardless of the redistricting institution.

The Article's relevance to courts, though, may ultimately stem less from these sorts of empirical details, and more from the link it establishes between partisan unfairness and representational distortion. The only reason for courts to try to police partisan gerrymandering is their belief that the practice subverts democratic values and will not cease in the absence of judicial intervention.[88] *Whether* the practice subverts democratic values, however, has been an open question until now.[89] It obviously produces discrepancies between parties' seat and vote shares, but these gaps are not necessarily tantamount to a democratic malfunction. What *is* undeniably a democratic malfunction, though, is representation that does not reflect the ideological preferences of the electorate—representation that is much more liberal or much more conservative than voters actually want.[90] And this is exactly the consequence of gerrymandering that the Article documents: at least at the congressional level, large efficiency gaps produce large shifts in the ideology of a House delegation's median member. Courts may therefore rest assured that their entry into this political thicket is theoretically justified. Representation itself, not just the alignment of parties' seat and vote shares, is imperiled by gerrymandering.

This threat is also highly pertinent to reformers. There are many practices that trouble good-government advocates: voting restrictions, unrestricted campaign expenditures, closed primaries, and so on. But few, if any, of these policies have the same confirmed connection with distorted representation as partisan gerrymandering. A strong case can be made, then, that reformers should prioritize gerrymandering above other ills that they seek to remedy. Most of these other ills do not drive a comparable wedge between voters and their representatives. (Or if they do, this effect has yet to be empirically demonstrated.[91])

Equally significantly for reformers, this Article's findings reveal that redistricting commissions do not generally benefit either party when they enact plans. Commissions, of course, are good-government advocates' preferred solution to partisan gerrymandering—an

---

[86] According to the 2010 Census, Wisconsin was 70.2% urbanized, compared to a national average of 73.6%. *See Census Urbanization Data*, *supra* note 41.

[87] As I noted earlier, I coded states' levels of black and Latino representation in a previous project. *See supra* note 40 and accompanying text.

[88] The canonical work making this argument is JOHN HART ELY, DEMOCRACY AND DISTRUST: A THEORY OF JUDICIAL REVIEW (1980).

[89] More precisely, it has been an open question at the *congressional* level. At the *state house* level, Tausanovitch & Warshaw, *supra* note 32, have already shown that large efficiency gaps influence both the ideal point of the median legislator and enacted policy.

[90] At least, this is a malfunction under any democratic theory that values congruence between voters and their elected representatives. *See generally* Nicholas O. Stephanopoulos, *Elections and Alignment*, 114 COLUM. L. REV. 283 (2014).

[91] For an effort to measure the representational consequences of a host of electoral policies, see Nicholas O. Stephanopoulos et al., *The Realities of Electoral Reform*, 68 VAND. L. REV. 761 (2015).

institutional response that removes the power to draw district lines entirely from the hands of self-interested legislators.[92] Commissions, it also turns out, are not a statistically significant driver of the efficiency gap at either the state house or the congressional level.[93] Nor, according to the nearest-neighbor matching, does "treating" an observation by switching from some other institution to commission control push the efficiency gap in either party's direction—not in earlier redistricting cycles and not in more recent decades either.[94] Reformers, then, should be heartened by this information as they lobby for commissions to be adopted in states across the country. Based on the historical record, there is little risk that these bodies will inadvertently assist either party.[95]

CONCLUSION

Recent advances in measuring partisan gerrymandering have not been matched by similar progress in understanding the practice's causes and consequences. Accordingly, this Article carries out the most rigorous examination to date of the factors that drive district plans' partisan skews and of these skews' representational implications. In a nutshell, the Article's conclusions are that single-party control of redistricting fosters partisan unfairness more than any other variable, and that such unfairness translates directly into ideologically distorted representation. These results are not necessarily surprising, but they establish that, at its core, gerrymandering is both a deliberate and a democratically debilitating phenomenon.

[92] *See, e.g.*, Stephanopoulos, *supra* note 14, at 487-91 (presenting the theoretical case for redistricting commissions).

[93] *See supra* Part III.A.

[94] *See supra* Part III.B.

[95] On the positive side of the ledger, there is also evidence that commissions reduce the size of the efficiency gap, *see* Stephanopoulos, *supra* note 14, at 496-501, and improve the ideological alignment between the median voter and the median state house member, *see* Stephanopoulos et al., *supra* note 91, at 813-15.

APPENDIX

TABLE 1: STATE HOUSE ANALYSIS

VARIABLES	(1) Main	(2) Random Effects	(3) Lagged EG	(4) Partisan Bias
Unified Democratic	0.0345***	0.0372***	0.0222***	0.0564***
	(0.00839)	(0.00937)	(0.00614)	(0.00946)
Unified Republican	-0.0211**	-0.0210**	-0.0128**	-0.0350***
	(0.00929)	(0.0102)	(0.00630)	(0.00944)
Commission	0.0194	0.0151	0.0154	0.0104
	(0.0126)	(0.0127)	(0.00962)	(0.0133)
Court	0.00342	0.00120	0.00160	0.00573
	(0.00855)	(0.00791)	(0.00622)	(0.00935)
Black Seat Share	-0.211*	-0.188**	-0.150*	-0.508***
	(0.108)	(0.0919)	(0.0899)	(0.184)
Latino Seat Share	-0.127	-0.0615	-0.0571	0.0492
	(0.0834)	(0.0703)	(0.0673)	(0.1000)
Urbanization	-0.196**	-0.112**	-0.153*	-0.0506
	(0.0935)	(0.0452)	(0.0798)	(0.113)
Democratic Vote Share	0.156**	0.172**	0.0924	0.809***
	(0.0670)	(0.0721)	(0.0571)	(0.131)
Seats	-0.000393	-0.000177	-0.000643**	0.000184
	(0.000291)	(0.000150)	(0.000261)	(0.000303)
Lagged Efficiency Gap			0.339***	
			(0.0436)	
Constant	0.120	0.0277	0.122*	-0.320***
	(0.0743)	(0.0410)	(0.0653)	(0.100)
Year Fixed Effects	Yes	Yes	Yes	Yes
State Effects	Fixed	Random	Fixed	Fixed
Standard Errors Clustered	Plan	State	Plan	Plan
Observations	786	786	745	436
District Plans	207	207	204	148
States	41	41	41	38
R-squared	0.643		0.690	0.707

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 2: CONGRESSIONAL ANALYSIS

VARIABLES	(1) Main	(2) Random Effects	(3) Lagged EG	(4) Partisan Bias
Unified Democratic	0.0324*	0.0316*	0.0222	0.0412*
	(0.0177)	(0.0182)	(0.0148)	(0.0243)
Unified Republican	-0.0459***	-0.0472**	-0.0421***	-0.0743***
	(0.0157)	(0.0187)	(0.0133)	(0.0190)
Commission	-0.0365	-0.0349	-0.0318	-0.0724*
	(0.0307)	(0.0283)	(0.0268)	(0.0409)
Court	0.0280*	0.0201	0.0223*	0.00284
	(0.0151)	(0.0132)	(0.0122)	(0.0163)
Black Seat Share	-0.154*	-0.151*	-0.101	-0.0808
	(0.0894)	(0.0866)	(0.0758)	(0.147)
Latino Seat Share	0.0526	0.244	0.153	0.320
	(0.178)	(0.172)	(0.143)	(0.304)
Urbanization	-0.364	0.0298	-0.264	0.239
	(0.225)	(0.0900)	(0.207)	(0.385)
Democratic Vote Share	0.105	0.146	-0.0157	1.104***
	(0.112)	(0.106)	(0.0993)	(0.197)
Seats	-0.00275	-0.000964	-0.00295*	-0.000556
	(0.00207)	(0.000730)	(0.00165)	(0.00285)
Lagged Efficiency Gap			0.234***	
			(0.0504)	
Constant	0.102	-0.0797	0.140	-0.676***
	(0.139)	(0.0733)	(0.124)	(0.237)
Year Fixed Effects	Yes	Yes	Yes	Yes
State Effects	Fixed	Random	Fixed	Fixed
Standard Errors Clustered	Plan	State	Plan	Plan
Observations	512	512	487	283
District Plans	136	136	133	112
States	25	25	25	23
R-squared	0.456		0.504	0.573

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 3: MINORITY REPRESENTATION ANALYSIS

VARIABLES	(1) State Houses	(2) Congressional Delegations
Unified Democratic	0.0363***	-0.00381
	(0.0105)	(0.0200)
Unified Republican	-0.00654	-0.0384*
	(0.0129)	(0.0205)
Commission	0.0185	-0.0263
	(0.0119)	(0.0287)
Court	-0.00124	0.0319**
	(0.00829)	(0.0150)
Black Seat Share	-0.151	-0.348***
	(0.115)	(0.116)
Unified Democratic x Black Seat Share	-0.0731	0.424***
	(0.106)	(0.152)
Unified Republican x Black Seat Share	-0.209*	-0.0776
	(0.118)	(0.187)
Latino Seat Share	-0.124	0.0757
	(0.0841)	(0.170)
Urbanization	-0.176*	-0.415*
	(0.0928)	(0.227)
Democratic Vote Share	0.156**	0.107
	(0.0680)	(0.100)
Seats	-0.000376	-0.00381*
	(0.000284)	(0.00206)
Constant	0.106	0.161
	(0.0739)	(0.142)
Year Fixed Effects	Yes	Yes
State Effects	Fixed	Fixed
Standard Errors Clustered	Plan	Plan
Observations	786	512
District Plans	207	136
States	41	25
R-squared	0.646	0.473

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 4: URBANIZATION ANALYSIS

VARIABLES	(1) State Houses	(2) Congressional Delegations
Unified Democratic	-8.30e-05	-0.112
	(0.0335)	(0.109)
Unified Republican	-0.0301	0.00909
	(0.0557)	(0.125)
Commission	0.0226*	-0.0254
	(0.0128)	(0.0320)
Court	0.00483	0.0313**
	(0.00860)	(0.0156)
Black Seat Share	-0.213**	-0.132
	(0.107)	(0.0894)
Latino Seat Share	-0.115	0.0655
	(0.0921)	(0.177)
Urbanization	-0.223**	-0.562*
	(0.0980)	(0.285)
Unified Democratic x Urbanization	0.0481	0.189
	(0.0447)	(0.138)
Unified Republican x Urbanization	0.0137	-0.0726
	(0.0717)	(0.161)
Democratic Vote Share	0.165**	0.137
	(0.0681)	(0.113)
Seats	-0.000401	-0.00218
	(0.000300)	(0.00219)
Constant	0.134*	0.225
	(0.0755)	(0.181)
Year Fixed Effects	Yes	Yes
State Effects	Fixed	Fixed
Standard Errors Clustered	Plan	Plan
Observations	786	512
District Plans	207	136
States	41	25
R-squared	0.644	0.462

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 5: CONGRESSIONAL REPRESENTATION ANALYSIS

VARIABLES	(1) Main	(2) Lagged DW-Nominate	(3) DW-Nominate Average	(4) Partisan Bias
Efficiency Gap	-1.405***	-1.331***	-0.673***	
	(0.137)	(0.156)	(0.0423)	
Partisan Bias				-1.607***
				(0.188)
Democratic Vote Share	-2.400***	-1.829***	-1.149***	-2.655***
	(0.178)	(0.196)	(0.169)	(0.582)
Lagged DW-Nominate Median		0.263***		
		(0.0538)		
Constant	1.259***	0.962***	0.607***	1.404***
	(0.0937)	(0.115)	(0.0833)	(0.270)
Year Fixed Effects	Yes	Yes	Yes	Yes
State Effects	Fixed	Fixed	Fixed	Fixed
Standard Errors Clustered	State	State	State	State
Observations	464	439	464	261
States	25	24	25	23
R-squared	0.823	0.837	0.942	0.788

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1