

Redistricting, Representation, and the Politics of Protecting Political Subdivisions

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With the dawning of the reapportionment revolution in the 1960s, the nature of redistricting changed throughout the country. Court involvement forced states to not only conduct timely redistricting but to also focus on the “one-person/one-vote” standard. This emphasis on equal population brought an end to often-blatant malapportionment but also to the use of geographic political subdivisions, namely counties, as a focal point of redistricting in many states. As a result, equal population became the primary way to evaluate the representational fairness of a redistricting plan. After 50 years, it is clear “one-person/one-vote” results in representational tradeoffs. Both parties attempt to use the equal population standard to their advantage (Cox and Katz 2002). Maximizing effective representation requires more than simply equalizing population between districts, as other important components remain in understanding the influence district maps can play in the relationship between legislator and constituent. One important standard is drawing lines that protect political subdivisions and/or communities of interest to the extent possible. Protecting these boundaries is one way to limit gerrymandering (Winburn 2008), makes it easier for constituents and legislators to understand their districts (Grofman 1995), and enhances citizen knowledge about their legislator (Niemi, Powell, and Bicknell 1985).

In this paper, we take the first systematic look, at least to our knowledge, at both the theoretical reasons for and the empirical realities of unnecessarily splitting counties in legislative redistricting. We define an unnecessary split as one where more a county receives more districts than necessary for equal population reasons. We begin by discussing the reapportionment revolution and its effect on geographic based redistricting principles, and establish the place of protecting political subdivisions in modern redistricting standards. As we discuss, we know about the history of the standard and a little about the representational consequences for

upholding the standard, but we do not know anything about why counties are split or left intact. Exploring the why is the purpose of this paper, and we then establish our expectations based on the strategic nature of redistricting. From there, we lay out our data, measurement, and methods. Analyzing the 2000 legislative redistricting, we present our analysis and discussion. Overall, we find important state, chamber, and county level factors influence redistricting outcomes in regards to protecting political subdivisions.

A Brief History of the Reapportionment Revolution

The ruling in *Baker v. Carr* (1962) started the reapportionment revolution as the Supreme Court reversed course set forth in *Colegrove v. Green* (1946) and ruled redistricting was in fact a justiciable matter. Quickly following they established equal population or, “one-person, one-vote” as the most important criterion in the redistricting process.¹ These rulings meant, “All other goals had to be implemented within the constraint of equal population of districts” (Cain, Mac Donald, and McDonald 2005: 8).

Before going forward with the consequences of these early rulings, it is necessary to understand the redistricting environment and goals prior to *Baker v. Carr*. The need for a reapportionment revolution arose from massive malapportionment, or large deviations in district populations, in many states, and the lack of regular redistricting for strategic political reasons. Namely, rural legislators refused to update district lines or used geographic based standards as a way to keep control in the face of growing urbanization throughout the country.

However, the focus on malicious malapportionment obscures the fact that many states used geographic units, namely counties, as a crucial component in their districting practices. In fact, counties often served as legislative districts (Ansolabehere and Snyder 2008) with states

¹ *Wesberry v. Sanders* (1964) set this standard for congressional districts while *Reynolds v. Sims* (1964) did the same for legislative maps.

using a federal model with upper chambers having geographic based representation and lower chambers having population based districts. Even in lower chambers, states recognized the need for geographic based districts. In an era before modern transportation and communication, districts built around political units were a matter of convenience for those representing far-flung and often rural areas of a state.

The importance of geographic units in legislative redistricting predates the current Constitution as, “Representation in colonial legislatures—as in their parent, the House of Commons—was based on communities, not on numbers” (Butler and Cain 1992: 24; see also Hardy, Heslop, and Anderson 1981).² Since the Constitution, many states adopted a version of the congressional model with county-based seat distributions in their upper chambers. This county-based system recognized the importance of local governments in the representational process much as the U.S. Senate uses a state based system. Undoubtedly, by the 1960s, this county-unit model became a method for protecting traditional rural centers of political power. In other words, politicians manipulated the system in place to their benefit with Georgia having one of the most criticized systems for diluting the voting strength of metro Atlanta for the benefit of the state’s rural political machine.³ While a constitutional compromise brought about state based representation in the U.S. Senate, the Court ruled in several key cases that counties did not serve the same purpose within states and brought the county-based model of allocating legislative seats to an end. In *Gray v. Sanders* (1963), the Court struck down Georgia’s county-unit system for electing statewide offices, and a year later *Reynolds v. Sims* (1964) established that state’s could not use an U.S. Senate like geographic based system. *Lucas v. Forty-Fourth General Assembly*

² Even today, this is an important consideration in the British system as boundary commissions can deviate from equal population to take into account issues of geographic accessibility.

³ See Bullock (2010: Chapter 6) for more details.

of Colorado (1964) strengthened the *Reynolds* decision that even popularly enacted geographic based systems were invalid under the emerging “one-person/one-vote” standard. These decisions fundamentally changed the redistricting standards and practices throughout the country and left the role of geographic based principles in doubt.

Over the next thirty years, the courts and the states learned to comply with standards that put equal population above everything else, especially in congressional redistricting. By the early 1970s, the Court had established absolute population equality for congressional districts in the cases of *Kirkpatrick v. Preisler* (1969) and *White v. Weiser* (1973). However, in legislative redistricting, the courts established some wiggle room for consideration of other redistricting standards within the ultimate goal of equal population. In cases from the 1970s through the 1990s, the courts allowed population deviation with justification for protecting other redistricting principles or standards. By the end of the 1990s, the courts had a history of allowing a 10% population deviation to protect other redistricting standards, and in a few cases the Court allowed plans with greater justification to stand if the state presented a compelling case for the population inequality. The *Larios v. Cox* (2004) decision from Georgia’s 2000 redistricting brought this 10% standard into question as the Georgia Democrats systematically under populated their districts while overpopulating Republican’s within this 10% range in an attempt to protect their fledgling majority. The ruling puts more of an onus on legislative mapmakers to justify their population deviations, no matter how small.

As the courts allowed for small population deviations in legislative plans, the importance of geographic units reemerged. The importance of protecting geographic units became one of several principles and concerns used during redistricting (see Winburn 2008). Following the *Shaw v. Reno* (1993) decision of the 1990s, the courts signaled the potential importance of

geographic based principles. The decision established race cannot be a predominant factor in redistricting decisions and stressed the role of geographic based principles like upholding political subdivisions as important considerations (Bowen 2011). Finally, outside of the courts, state legislatures recognized the importance of protecting political subdivisions as 41 states have some form of the standard applicable to congressional, legislative, or both plans (Redistricting Law 2010). Political subdivisions play an important role in the redistricting process, but take an important back seat to the paramount concern of equal population.

In terms of the effectiveness of representation, what does it matter if protecting political subdivisions is considered during redistricting? Obviously, “The equal population criterion inevitably wreaked havoc on geographic representation since in many instances homogeneous communities of interest had to be split or combined in order to achieve population equality among districts” (Cain, Mac Donald, and McDonald 2005: 8). These unnecessary splits may weaken effective representation in several key ways. First, counties provide an easy reference point for citizens to identify their legislative district. Based on Grofman’s idea of “cognizability” or “recognizability,” one goal of redistricting should be to design districts in which legislators can communicate, “*in commonsense terms, based on geographic referents, the characteristics of his or her geographic constituency*” (1995: 30-31; italics in original). This gives voters an easy method to match their community with their district. The violation of the political subdivision standard with the unnecessary splitting of county or other local political boundaries clearly goes against this standard. Even while the Court was establishing equal population and dismissing county-based redistricting, they acknowledged the importance of protecting political boundaries. In both *Reynolds v. Sims* (1964) and *Taylor v. McKeithen*

(1972), the Court opined that political units should be followed as much as practical because they mean something to the voters (Morrill 1981).

This is an important point when considering other geographic standards, namely compactness. Compactness, which has received much scholarly and legal attention as a preventative measure against gerrymandering (Polsby and Popper 1993), lacks this crucial quality. Making a district compact does not guarantee either legislator or citizen will be able to readily identify their district, but only that it is in some mathematical definition “close together.” Furthermore, there is no clear consensus on the best way to measure and implement compact districts (Niemi et al. 1990), and many compactness measures are not strict enough to actually limit gerrymandering (Altman 1998). On the other hand, Winburn (2008) finds political subdivisions standards can place limits on gerrymandering.⁴

Beyond being a building block that make districts recognizable and a potential way to put some limits on gerrymandering, we know when counties are split voters have negative representational consequences. Winburn and Wagner (2010) show that constituents’ recall of their members of Congress is less when their less overlap between their district and county boundaries. Recall was highest in non-split counties. Niemi, Powell, and Bicknell (1986) found similar results between district and community congruity as voters living in areas with less district-community congruence had less awareness of their congressional candidates. Interestingly, Winburn and Wagner (2010) and Engstrom (2005) do not find that these effects translate to less voter turnout suggesting the major consequence of splitting county boundaries is informational effects. However, when studying the consequences of redistricting constituents between districts, Hayes and McKee (2009) do find a drop in participation rates via roll off.

⁴ Some reformers use the landmark voting rights case of *Gomillion v. Lightfoot* (1960) as evidence the Court sees plans that split local political subdivisions as “inferior, and in some cases, evidence of unconstitutional gerrymandering” (Redistrictingonline.org, “What are Traditional Redistricting Principles?”).

Finally, Winburn and Wagner (2011) find the consequences of unnecessary boundary splitting goes beyond information effects and spills over into distributive politics. Counties with more districts than necessary receive fewer discretionary grants from the federal government. Overall, research in this area is relatively new, but studies are uncovering negative representational consequences for constituents when the communities they live are used as pawns in the redistricting game.

Protecting political subdivisions clearly has a place in the debate over the proper way to redistrict and we are beginning to understand some of the consequences related to dividing counties. However, we do not have any understanding to the reasons why district lines split counties. For a more complete view of the place and effectiveness of the political subdivisions standard in redistricting, we need to know if there are systematic factors that drive where mapmakers draw lines in relation to county or other local boundaries. With this understanding, lawmakers, judges, and others involved in the process can better appreciate the balancing act between population equality and protecting subdivision lines and have a better mechanism for identifying gerrymandering.

Expectations

Our purpose is to determine the factors that systematically influence a mapmaker's decision to unnecessarily split a political boundary. Specifically, we examine the strategic decision to split a county based on factors that may enhance the gerrymandering strategy of those designing the map. One important consideration for a successful gerrymander is to draw a map that serves its purpose while withstanding both public and judicial scrutiny. We also look at potential non-strategic factors that may also influence these outcomes. Redistricting is a complex and complicated process, and to understand the potential strategic and non-strategic

factors at work we discuss four broad categories of explanations: socio-economic and demographic, institutional, procedural, and spatial. Below, we discuss the theoretical underpinnings for the potential influence of these factors on the ultimate decision for a mapmaker to protect a county boundary or split it unnecessarily. We examine the factors that most likely play into a strategic gerrymander while also mentioning other factors we control for and their importance in the process.

Before continuing to our argument, it is important to define our empirical focus in this paper. We are measuring the intactness of county boundaries. However, we are not suggesting they are the only appropriate way to conceptualize and measure either the standard of protecting political subdivisions or communities of interest. In some cases, they clearly are not. Rhode Island for example as four counties but they serve no authoritative function. Instead, communities or towns are the key local government unit. However, in most states, counties are a key local political unit especially in regards to elections and are easier to measure than the more abstract idea of communities of interest based on racial, economic, or cultural overlap. Most states with political subdivision standards specifically mention county boundaries. Some states are more specific in their definitions. Ohio specifies from the county down to the ward level regarding keeping these subdivisions intact. Given the historical focus on counties and their importance in the electoral system, they are an appropriate unit to analyze.

Institutions

Control of the process is our primary concern as it provides us with best proxy for redistricting strategy. Here we view divided control of the process as a proxy for incumbent protection goals while partisan control as one for partisan gerrymandering with other actors not having a clear theoretical gerrymandering goal. In most states, redistricting is endogenous to the

policy-making process of the legislature. By extension, those institutions which are known to influence legislative processes may also influence redistricting decisions. Some states, however, delegate redistricting authority to partisan or nonpartisan commissions. McDonald (2004) suggests the political outcomes from partisan commissions are very similar to those from the legislature controlled by the majority party, with plans advantaging that majority party. Since the 1960s, the courts have played an important role in all aspects of process from courts influencing maps, selecting among maps, or even producing the maps in some districting plans.

We model the various redistricting institutions which implemented the plans used in our data through a series of dichotomous variables. Partisan redistricting – whether exercised through the normal legislative process or via a partisan redistricting commission – is accounted for with two dummy variables, one for each major political party. Dummy variables for nonpartisan commissions and court-drawn plans are also included. States who redistrict through the legislative process but did so in divided government, which effectively limits the ability of the majority party to carry out a partisan gerrymander (in most circumstances) is the reference category. A key insight from McDonald (2004) is the prevalence of incumbent protection gerrymanders in situations of bipartisan redistricting control. We expect each institutional dummy variable captures the effect of moving from an incumbent gerrymander to a plan drawn with other goals in mind (which goals depend on the institutional arrangement and party control).

Effective party strategies diverge in relation to county-based redistricting. Researchers have long noted that supposedly race and party neutral redistricting criteria (like compactness and respecting counties and subdivisions) may hurt the Democratic Party electorally (Lowenstein and Steinberg 1985; Altman 1998). The rationale is simple: since, in most states, the Democratic Party's strength lies in dense urban areas that are highly Democratic, noncompact districts and

districts crossing county boundaries are necessary for an optimal partisan gerrymander. Not doing so effectively “packs” Democratic voting constituencies into a relatively small number of districts, given the partisan residential patterns of most American states and cities. Republican-controlled redistricting bodies, in other words, can forward redistricting plans which favor the party *and* protect county borders in ways in which Democrat-drawn plans cannot. In general, divided control, however, should produce plans which split counties, as mapmakers protect incumbent seats by trading out-party voters with neighboring districts. Such manipulation is unlikely to follow political boundaries. We expect party-controlled redistricting to lead to less splitting than divided-control redistricting, especially when Republicans control the process. Finally, non-party controlled actors (bipartisan commission and the courts) should follow county lines more faithfully as they are trying to maximize the representational fairness of the plans and do not have an overriding strategic goal for splitting counties.⁵

We also include other institutional controls. Term limits change the redistricting atmosphere as incumbents are forced out and the parties have more open seats to contend with (Schaffner, Wagner, and Winburn 2004). Professionalism and chamber partisan competition are also important factors that may condition the goals of the mapmakers and their ability to maximize their strategic goals.

Procedural

The rules and standards in place in a state should limit the ability of those drawing the maps to implement their preferred gerrymander. Of course, smart line drawers can work around these, but redistricting standards provide a baseline of comparison for the public and the courts to

⁵ Our institutional expectations come from a theoretical focus on the strategic goals of redistricting. However, we are a bit skeptical of empirical reality given recent findings that redistricting control does not influence electoral outcomes (Winburn 2011; Masket, Winburn, and Wright 2012).

consider when evaluating plans. Winburn (2008; 2011) and Forgette, Garner, and Winkle (2009) find redistricting rules can limit gerrymandering and have a significant influence on electoral outcomes. We assume they matter here as well. Of course, these standards are statewide and not county based. In general, we expect counties in states with specific restrictions against splitting political subdivisions to have fewer unnecessary splits. We also control for a communities of interest standard, compactness, and if the state falls under the Voting Rights Act to see if it the specific standard that matters or just the presence of any of these important rules.

The use of multi-member districts (mmds) is another important procedural aspect of redistricting. When a state uses mmds the effectively reduce the number of actual districts drawn while keeping their ideal district size the same. This should make it easier to uphold county boundaries. We also control for the size of a chamber to see if the number of districts has a non-strategic role in this process.

Socio-economic

County demographics are the context for any districting plan. The redistricting literature is replete with examples of the importance of such items. While overall population is the driving force behind the process, we see no clear strategic goal associated with either targeting large or small counties for splitting. More populated counties may be easier to split without receiving any unwanted focus from either the public or the courts, but what really drives the outcome is who lives in a county and not just the overall number of people.

Two important and often related factors are wealth and education. In terms of county wealth, we can see two potential outcomes. First, wealthier counties may be better equipped to protect their interests during the redistricting process and the citizens understand they receive more effective representation by staying intact. On the other hand, wealthier counties may also

be a larger target for mapmakers seeking to spread potential donors to multiple campaigns as incumbent legislators vie for (or get protection from poaching) key members of their reelection constituency (Fenno 1978). In terms of education, this signals a more aware and politically active constituency. Therefore, counties with a highly educated population should be less to receive unnecessary splits as mapmakers want to avoid upsetting citizens who may actually pay attention and perceive unnecessary splits as a slight of their representation.

Both before and after the Voting Rights Act, race has played an integral role in American redistricting. Prior to the act, and prior to the equal-population landmark court cases in the 1960s, counties were effectively used to reduce the voting power of urban African Americans (along with urban whites) (Ansolabehere and Snyder 2008). Mapmakers in the post-VRA world must ensure fair representation of racial and ethnic minorities, assuming sufficient size of minority residents whose residential patterns are geographically clustered. As such, redistricting authorities must ensure counties with large minority populations support majority-minority districts. Even in a post-*Reno* landscape, mapmakers on both sides of the aisle can use minority populations to their strategic advantage. We expect counties with large minority populations⁶ to receive unnecessary splits to either accommodate racial fairness or strategically place minority voters in differing districts regardless of county boundaries. Of course, those drawing the maps cannot do this as brazenly as in the 1990s but may believe they can still support their decisions based around issues of maximizing racial fairness.

Spatial

The redistricting outcome for one county does not occur in a vacuum. What happens in one county influences what happens in other counties, especially neighboring counties. We must

⁶ Racial effects are modeled here through the use two county-level determinants: percent African American in the county and the percent Hispanic in the county. Both variables come from the 2000 Census (SF3) and collected by the U.S. Census Bureau.

account for the spatial component of this process. We discuss this in more detail in the methods section below, but do account for the county intactness of a county's neighbors directly in the models. We expect a county will be less intact if its neighbors are also less intact. This is because once a district slices through one county it is more likely to slice through surrounding ones as well to reach the necessary population for the district.

Data and Methodology

We examine the 2000 legislative redistricting outcomes for upper and lower chambers across the country in the plans implemented for the first post-redistricting election of the decade. We drop Nebraska and Rhode Island due to missing data. Our unit of analysis is the county and we use a mix of precinct level, GIS, and Census data to gather the necessary information regarding our dependent and independent variables. In addition, we rely on state level redistricting rules and procedures and chamber level data to complete the data collection. Each county is in the data set twice—once for the upper chamber plan and once for the lower chamber plan.

The dependent variable in the analysis is the ratio of districts in a county to the ideal number of districts depending on the number of seats in the legislative chamber and the population size of each state. A score of 1 on this variable results in a perfect translation of county population into seats. Scores of less than one are possible due to multimember districts and slight deviations in equal population across districts. Scores greater than one show the county has been split more than necessary given its population. A score of two, for example, means the county is split into twice as many districts as its population warrants. The mean ratio is 1.29 in the upper chambers and 1.31 in the lower chambers showing that the average county had slightly more districts than mandated by population. However, the modal score is 1 as

roughly 2/3s of the counties received the proper number of districts based on population, or were left correctly intact.⁷

Theory suggests the data generating process during redistricting is inherently multilevel: redistricting bodies in all states draw plans for the entire state, yet sub-state factors are always at play. Combinations of demographics within and between counties and state redistricting law, redistricting institutions, and the broader legislative institutions should predict the extent of county splitting. The results of redistricting are thus inherently multilevel and spatially determined: predictors come from two distinct levels (the county level and the state level), with decisions made in one county necessarily affecting decisions in neighboring counties.

The above reasoning suggests important methodological concerns. First, the multilevel structure of the data results in a lack of independence across the level-1 units, in this case, counties. County splits within a state are not independent of one another but are likely to be more similar to the nature of the splitting in other counties within the state. This lack of independence usually results in under-estimation of the standard errors of level-2 independent variables and increased probability of committing Type-I errors (Steenbergen and Jones 2002; Gelman and Hill 2007; Rabe-Hesketh and Skrondal 2008) and OLS coefficients are no longer the most efficient alternative. Analysts typically turn to fixed effects or random effects models to correct these problems. In our case, however, neither solution is entirely satisfactory.

Random effects, or multilevel or hierarchical models, employ variance-component estimation where level-1 units are assumed to be independent conditional on the level-2 error term. So in our analysis, county results are assumed to be independent of other county results *in the same state*. This assumption does not hold in redistricting. In fact, we expect splitting

⁷ Counties with a population over the ideal district size must be split to achieve population equity. We consider them intact if the plan allocated the appropriate number of seats based on the county population and the district's ideal size.

decisions to be highly spatial in nature, with decisions about dividing one county influencing decisions about neighboring counties. Put differently, multilevel models do not account for the spatial autocorrelation inherent in redistricting data: the error term for any given county should be correlated with the error term from proximate counties.

Spatial econometricians have advanced various spatial lag and/or error models to correct for the spatial autocorrelation in parameter estimates. The most basic spatial model, referred to as a spatial (or simultaneous) autoregressive model (SAR), is an OLS model which includes a lagged dependent variable representing a weighted average of the dependent variable in spatially-proximate units. Another version of the SAR replaces the spatial lag with a spatially autoregressive error term. These strategies can also be combined to create a spatial lag model with a spatial autoregressive error term, what Drukker, Prucha, and Raciborski (2011) refer to as a SARAR model (spatial autoregressive model with autoregressive disturbances). Such approaches nicely correct OLS for the lack of spatial independence, but they *do not address the lack of independence due to the nested nature of the data (counties within states)*. In short, the modeling techniques available in standard statistical software packages can account for serial correlation due to nested data or spatial dependence, but not both at the same time.

A spatial-weights matrix based on county contiguity was created using Stata's `spmat` command and county shapefiles from the U.S. Census Bureau. The contiguity matrix takes on a value of one for each bordering county and zero otherwise. The contiguity matrix counts bordering counties even if they are in another state, since some potential determinants of county splitting may be socio-economic or geographic in nature (mountain ranges, rivers, and residential patterns all cross state lines). Using this matrix the dependent variable shows evidence of spatial dependency: the global Moran's I score is .19 and is significant at the .001 level, meaning that

the spatial clustering in county splits seen in the data would hardly ever occur by random chance alone.

Moran's I score indicates that a multilevel model, with varying intercepts by state to address state-based serial correlation across counties, will not correct for all the autocorrelation in the data. We proceed with the analysis by using a combination of approaches and note the strengths and weaknesses of the various models. We first estimated a SARAR model, which includes both a spatial lag and a spatially weighted autoregressive error term. Such a model accounts for spatial dependence but not the nested data structure. We estimated a random intercept multilevel model, which corrects for correlation within states but not across space. Finally, we estimated a series of OLS regressions which included both a spatially lagged dependent variable and robust standard errors clustered by state. This last model attempts to account for both sources of autocorrelation, but does neither as well as the previous models. The results from all these modeling strategies are presented in Figures 1-4. We estimate models for each chamber and additional models with conditional effects included.

Results

Figure 1 presents the results from the SARAR, multilevel, and SAR with clustered errors models using the county scores with data on lower chamber districts. County-level determinants loom large in the analysis. County population size is a negative and significant predictor of county splitting, meaning that more populous counties are split less often than small counties. This may signal the electoral power of urban or metropolitan areas of states, with rural counties and interests divided across districts. Another explanation is more functional. It is difficult to split a county whose ideal number of districts is 20 into 40 or 60 districts, while a county deserving of one district may easily be split into 3. A scatterplot of the two variables bear out this

reasoning: the variance of county splitting is much higher among small counties than large ones. Still, the bivariate trend among just counties greater than the average county population (about 90,000 residents) is negative, suggesting the negative relationship cannot solely be attributed to the way the dependent variable is calculated. Strategic redistricting decisions do not appear to be the driving force behind this variable.

One of the strongest findings in Figure 1 is the effect of county wealth. Wealthier counties are split more often than are poor counties, and the findings are robust to the modeling strategy used. Mapmakers may be attempting to spread wealthy voters (and potential campaign donors) among districts and incumbent legislators. Or, legislators themselves may fight for maintaining wealthy areas in their own districts. Subsample models (not shown) suggest this effect is strongest in states whose maps were produced by divided government, adding support to the idea that incumbent legislators are dividing wealthy counties into multiple districts to secure reelection. Highly educated counties are less likely to be split, controlling for other factors.

The results regarding the racial expectations are mixed. The percent African American in the county is positively and significantly associated with county splitting in all three models, but the opposite trend is found for percent Hispanic. The latter is significant for the two spatial lag models only. Certainly the results regarding African American populations suggest a reality of redistricting: in order to protect the ability of minority population to reach a numerical majority, territorial districts may need to divide counties and other natural communities of interest.

In contrast with the impetus behind recent redistricting reform movements in Arizona, California, Ohio, Florida and other states, we find very little evidence that the redistricting institution matters for county splitting. Partisan-controlled maps do not split counties more than those drawn under bipartisan control. However, Figure 2 does show a potential reason. The

effectiveness of party-controlled redistricting is influenced by professionalism. Substantively, under the condition of bipartisan redistricting control, greater professionalism is associated with more county splits, which can be understood through the lens of the incumbent protection gerrymander (McDonald 2004). Professionalism increases the power and visibility of incumbent legislators vis-à-vis the party and may increase the ability of the legislators to tweak district boundaries in their own favor. Under Democratic Party control, however, the total effect of professionalism is zero – Democratic mapmakers do not split counties more often when controlling professional legislatures. Professionalism is negative and significant under Republican-dominated redistricting processes, perhaps because professionalism enables Republicans to more effectively pursue an effective redistricting strategy of protecting counties boundaries for party gain.

Among procedural redistricting criteria, respecting political subdivisions is by far the most important predictor of county splits. No other criterion approaches statistical significance. Respect for subdivisions is also in the right direction: states, which require mapmakers to protect county (and other subdivision boundaries), have lower actual to ideal district ratios, showing the criterion is effective. Laws regarding the protection of communities of interest, while negatively associated with county splitting, fail to reach conventional significance levels.

The districting context is also important for county splitting. Larger legislative chambers (and thus smaller districts) are associated, somewhat paradoxically, with less splitting. This effect, however, appears to be driven entirely by New Hampshire which has by far the largest House chamber in the country and low actual to ideal district ratios. When New Hampshire is dropped from the analysis, chamber size is no longer statistically significant. The null finding is supported in the Senate results (Figure 3) as well. However, strong support exists for

multimember districts. MMDs allow mapmakers to create multiple districts from larger geographic areas, which make following county boundaries more likely.

Finally, Figures 1 and 2 show evidence of spatial effects. As the number of bordering counties increases, so does the relative number of county splits. The coefficient for the spatial lag in the simple SAR model with clustered standard errors is significant and positive with a value just under .2. This is a meaningful association, given that a perfect ratio of actual to ideal number of districts is 1. But the SAR model cannot differentiate between types of spatial effects. The SARAR model, with its lag and spatial disturbance term, helps here. The spatial lag has a negative coefficient of -.45 while the autoregressive coefficient ρ is .59. Both are significant. The spatial lag coefficient illustrates the direct relationship of neighboring counties' splits, according to the modeled predictors. An increase in a neighboring county in the district ratio leads to a decrease in the number of splits in a county. However, the effect of exogenous or unmodeled changes to neighboring district ratios is associated with increased splitting. The overall spatial effect, as in the SAR model, is positive and significant: the more a county is split, the more likely its neighbors are to be split.

Figures 3 and 4 present the same analysis conducted using data from state senates, rather than house districts. The results are largely similar, with some important deviations. County population is still negatively associated with county splitting, although the magnitude here is only half of what was found in the lower chamber districts. This finding is consistent with the idea that urbanized interests are more powerful in lower chambers due to smaller districts sizes and thus more districts in these areas. County wealth is the opposite – still positive and significant but roughly twice the size of effect found at the house level. College education is no longer significantly related to the frequency of county splits. The effects for racial variables are

more understandable in the senate models. Both Hispanic populations and African American populations are positively signed, although only percent Hispanic in the county is significantly related to county splits at conventional levels.

Redistricting law and institutional control appears to be more important for upper chamber redistricting. Both respecting subdivision boundaries and protecting communities of interests are associated with lower district ratios, perhaps signaling that counties are more likely to be seen as communities of interest in the upper chamber, a notion well-grounded in historical districting practices (Ansolabehere and Snyder 2008). Court influence is significant and positive in the all three upper chamber models shown in Figure 3, illustrating the courts' focus on goals other than county protection in the redistricting process, and counter to our expectations. Finally, while the signs of the coefficients in the interaction model presented in Figure 4 match those in Figure 2, neither the interaction terms nor the legislative professionalism constituent term research statistical significance for the senate district models. Senators, as more experienced, powerful and visible legislators than their counterparts in the House, may not be as reliant upon professionalism to deliver personal and party goals during the redistricting process.

Discussion

Given the complex and multilevel nature of redistricting, our findings support several important points. First, at the state level, redistricting control, despite clear strategic theoretical expectations, does not have much influence on county intactness, and where it does (court drawn senate plans) the finding goes in the opposite direction than anticipated. This supports other work on the role of redistricting institutions and shows that the strategic goals are the same regardless of who draws the map or the rules and circumstances have equal influence regardless

of who is in charge. Speaking of the rules, counties in states with a rule protecting political subdivisions are less likely to have unnecessary splits. This shows the rules work.

At the institutional chamber level, we find mixed support for the role of important legislative characteristics. Professionalism is an important conditioning factor in the lower chambers and provides evidence for the role of strategic partisan goals. Another sign that mapmakers can strategically split counties is the fact that counties in more competitive chambers have more county splits. Although the coefficient is quite small and the significance is inconsistent in the models. Also in the lower chambers, mmds can lower county splits. This important factor deserves more attention in future analysis.

At the county level, we find an interesting pattern. Specifically, wealthier counties receive more splits. We believe this shows mapmakers are not just concerned about electoral outcomes but having wealthy potential donors in their district. This is clear evidence for strategic goals underlying the decision to split a county. It is simply not happenstance or based on non-strategic factors, like population size along with chamber size. Our results generally show the importance of race as a consideration in redistricting, as counties with large minority populations tend to have more splits to accommodate goals of racial fairness. Finally, a county's redistricting fate is also linked to that of its neighbors. Our spatial analysis, not surprisingly, confirms the inherently spatially dependent process at work.

Conclusion

The contribution of our paper is to call attention to the role of political subdivisions in the redistricting process and the factors that lead to adherence and manipulation of county boundaries. Also very importantly, we discuss important methodological issues related to accurately modeling redistricting decisions and outcomes. The process is both inherently

multilevel and spatial producing an interesting set of methodological concerns. We discuss multiple ways to deal with these problems; unfortunately, none is completely satisfactory in isolation. However, our multiple modeling approach provides some piece of mind regarding the robustness of our findings.

Substantively, this is the first attempt at understanding why protecting political subdivisions are split or left intact. We find evidence of strategic manipulation of county intactness. Mapmakers are much more likely to divide wealthy counties, and we argue this highlights the desire to spread wealthy donors around to help those in office. Our findings are a starting point for understanding what drives decisions regarding individual communities in the redistricting process.

Our other main findings build on existing literature on the nature of the redistricting process. First, taking control away from the legislature does not produce different results. This reform does not appear to be the answer to stopping gerrymandering. However, more promising is the rules of the game. Mapmakers, regardless of their strategic intent, must follow, at least to some degree, the rules a state sets for their redistricting. Given the importance of political boundaries in the redistricting process, we believe finding unnecessary splits is one way to measure gerrymandering without relying on election returns. Counties in states with a rule protecting political subdivisions are less likely to be split, and we argue less likely to suffer from gerrymandering. We do not dare suggest this indicates a plan free from gerrymandering, as there are many ways to carve up the maps, but we think it is a clear and measurable way to demonstrate protection of important representational goals.

While not a cure all for gerrymandering, the one-two punch of equal population and protection of political subdivisions can be an important deterrent. Overall, a shift in focus to

upholding appropriate geographic units in conjunction with some set flexibility in population equality can provide for more effective representation across the country. We agree with Engstrom (2005) that the current implementation of “one-person/one-vote” misses the target for producing fair and effective representation. However, unlike Engstrom, we are not calling for a move to alternative systems of voting but rather a shift in the standards used to determine constitutionally fair districts and districts that maximize representation.

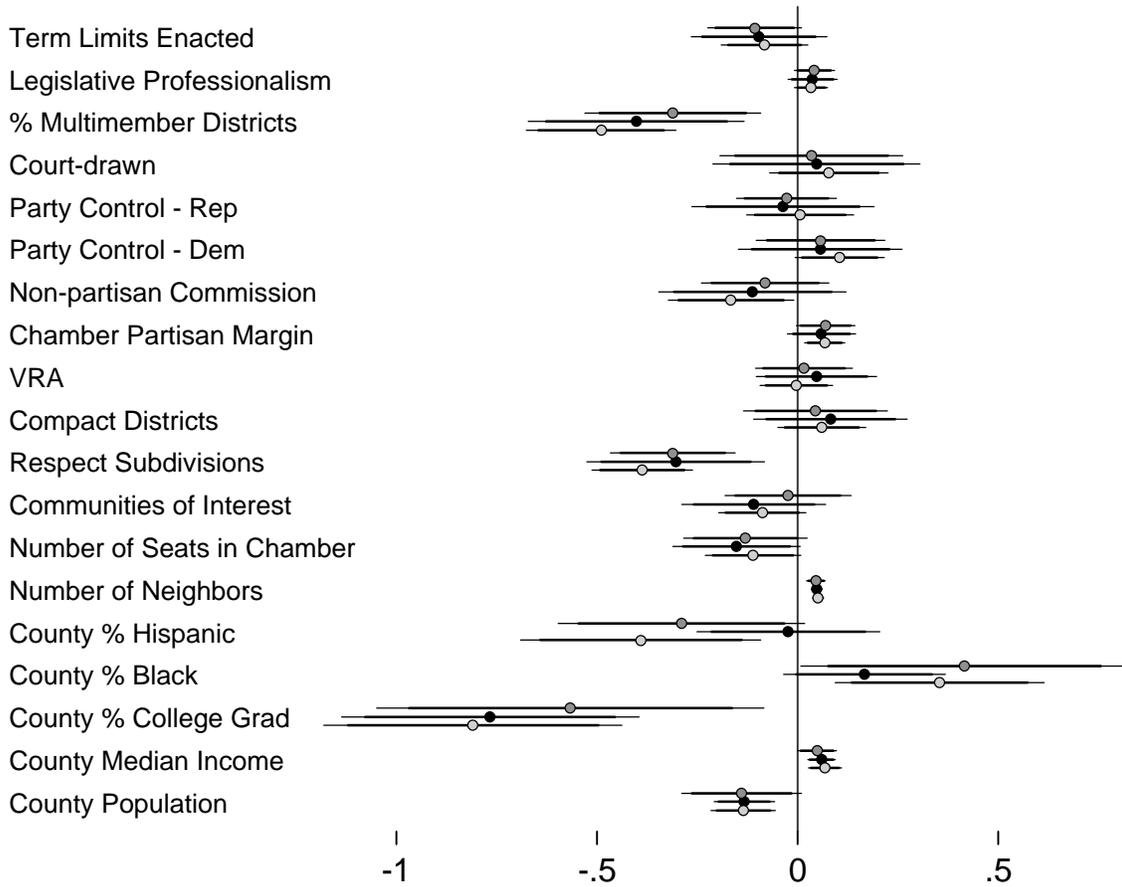
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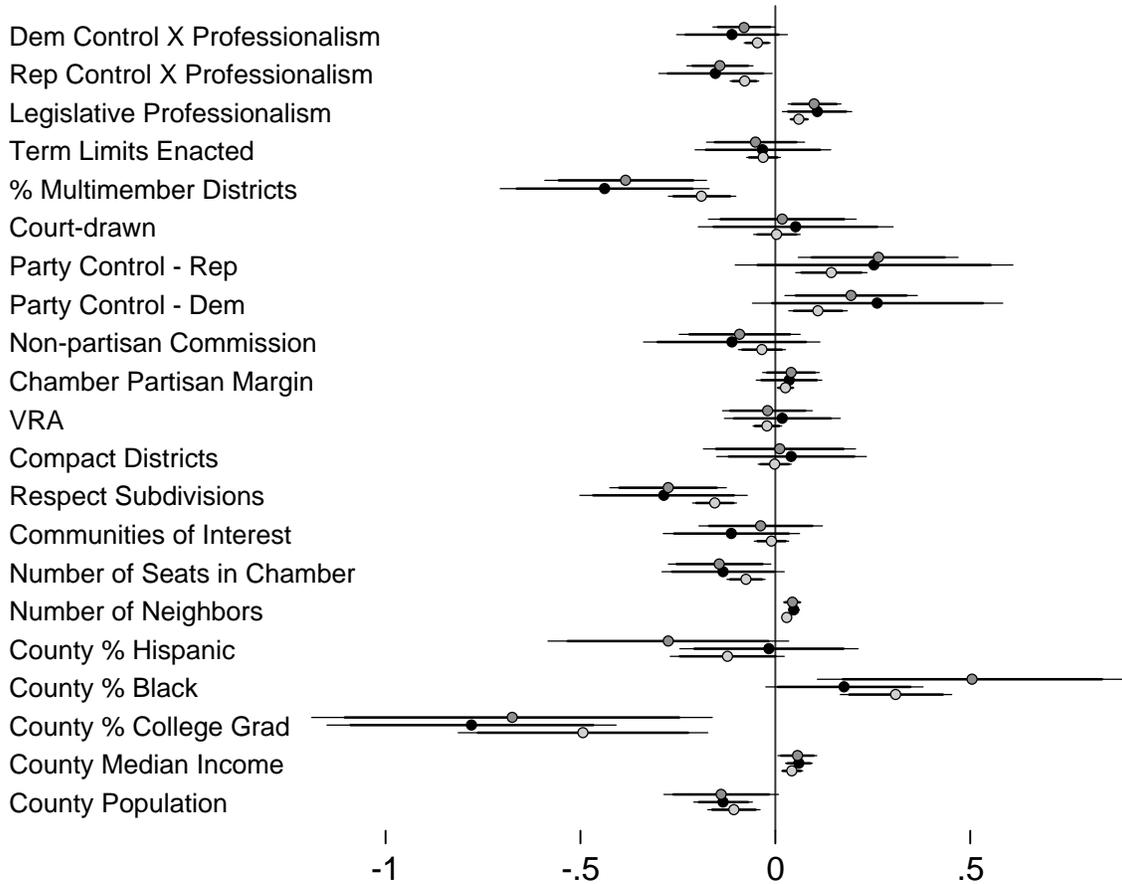
Figure 1. Dividing Counties: State Houses, Parameter Estimates



Note: The dependent variable in the analyses is the ratio of actual number of districts per county to the ideal number of districts, with values greater than one denoting extra county splits. Figure shows coefficient estimates (points) and confidence intervals (lines) across three models. Dark grey points present parameter estimates from the SARAR model (spatial lag and error model), black points show coefficients from random intercept multilevel analysis, and light grey points display the SAR model estimates. The lowest six sets of estimates are measured at the county level, while the rest are aggregate (state or chamber) data. Models do not include Nebraska or Rhode Island due to missing data. Spatial weights matrix is a contiguity matrix with row standardization. Thin lines representation 95% confidence intervals and thicker lines show 90% confidence intervals around coefficient estimates.

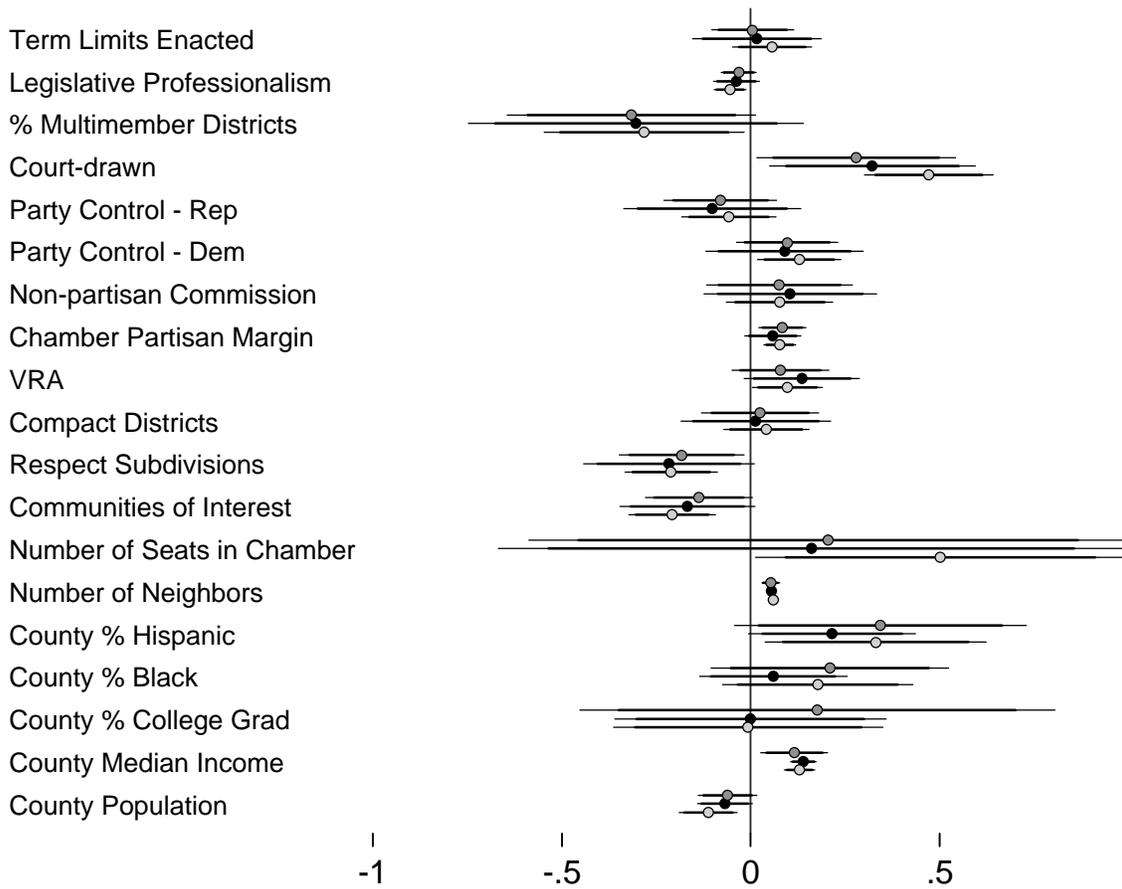
Figure 2. Dividing Counties with Professionalism Interaction: State Houses, Parameter

Estimates



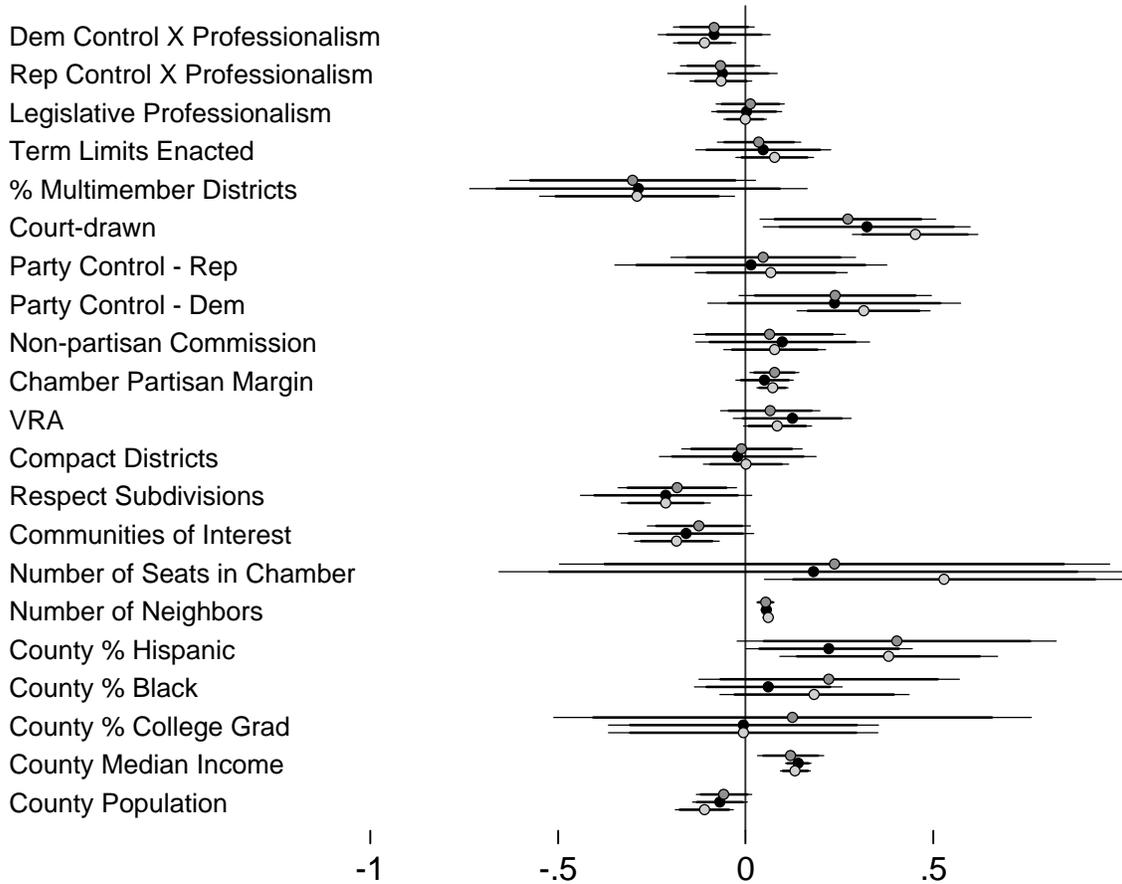
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Figure 3. Dividing Counties: State Senates, Parameter Estimates



Note: The dependent variable in the analyses is the ratio of actual number of districts per county to the ideal number of districts, with values greater than one denoting extra county splits. Figure shows coefficient estimates (points) and confidence intervals (lines) across three models. Dark grey points present parameter estimates from the SARAR model (spatial lag and error model), black points show coefficients from random intercept multilevel analysis, and light grey points display the SAR model estimates. The lowest six sets of estimates are measured at the county level, while the rest are aggregate (state or chamber) data. Models do not include Nebraska or Rhode Island due to missing data. Spatial weights matrix is a contiguity matrix with row standardization. Thin lines representation 95% confidence intervals and thicker lines show 90% confidence intervals around coefficient estimates.

Figure 4. Dividing Counties with Professionalism Interaction: State Senates, Parameter Estimates



Note: The dependent variable in the analyses is the ratio of actual number of districts per county to the ideal number of districts, with values greater than one denoting extra county splits. Figure shows coefficient estimates (points) and confidence intervals (lines) across three models. Dark grey points present parameter estimates from the SARAR model (spatial lag and error model), black points show coefficients from random intercept multilevel analysis, and light grey points display the SAR model estimates. The lowest six sets of estimates are measured at the county level, while the rest are aggregate (state or chamber) data. Models do not include Nebraska or Rhode Island due to missing data. Spatial weights matrix is a contiguity matrix with row standardization. Thin lines representation 95% confidence intervals and thicker lines show 90% confidence intervals around coefficient estimates.