THE EVALUATION OF REDISTRICTING PLANS

Over recent redistricting cycles, I have been pondering how to produce an objective evaluation of the comparative quality of redistricting plans. I began to experiment, first, in the areas of competitiveness and fairness between the parties while I was working in Kentucky legislative redistricting in 1995. My thoughts had progressed far enough by 2001that I had generated a list of eight principles for use in evaluating redistricting plans and formulas to quantify the quality of plans' compliance with these principles. I used these formulas to evaluate congressional redistricting plans in Texas in 2001. I call this evaluative instrument, Redistricting Plan Quality Index.

A plan does not qualify for evaluation unless it satisfies three mandatory requirements. It must comply with the federal constitutional requirements regarding population equality. It must comply with any applicable provisions of the federal Voting Rights Act. It must have geographical integrity, which means that every census block is assigned to one, and only one, district, and every district is composed only of contiguous territory.

If a plan satisfies these three mandatory requirements, then I process the data relating to the plan to enable an objective evaluation of the quality of the compliance of the plan with eight principles. These principles are not absolutes. They are relative, and the best plan is the one which reaches the best balance among these principles. The eight principles, stated, for simplicity, as absolutes, are:

Districts shall be of equal population.

Districts, viewed as groups of voters, shall be as stable as possible, that is, the fewest possible number of people have been moved from the voter group with which they have been participating in electing a member of congress or a district's state legislators.

Counties shall not be divided unless necessary to satisfy the mandatory requirements..

Municipalities shall not be divided unless necessary to satisfy the mandatory requirements.

Districts shall be compact.

District boundaries shall follow the boundaries of political subdivisions.

Districts shall be as competitive as the state, that is, the party balance in each district shall mirror the party balance in the state.

Districts shall provide equal opportunity for both major parties to win control of the legislative body when the voters of the state are equally divided between the parties.

These principles are stated here in absolute form. However, the operation of the evaluative process involves balancing them against one another.

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I will briefly explain the formulas I use in evaluating the quality of a plan. Each formula is structured to produce a score between 0 and 100, although in the case of some formulas, for example, compactness, it is difficult to imagine how a score of 100 could be achieved. In cases in which the draftsman of a plan has substantially violated a principle, it is possible to produce a negative score. The final Redistricting Plan Quality Index for each plan is the average of the individual scores for the eight factors evaluated.

For Population Equality, I compute the overall range allowed by the U.S. Supreme Court, on the assumption that the plan satisfies the Supreme Court test that population deviations in the plan are there solely to accomplish legitimate state purposes. Then, I compute what number of persons would be allowed by that overall range to be in a district different from the one which absolute population equality would require. I compute the actual number of persons in each plan who would have to be in a different district for that plan to be characterized by absolute equality, and determine what percentage that is of the total allowed within the overall range. The value assigned to the plan for Population Equality is the unused portion of the total allowed within the overall range.

For Population Stability, I compute for each proposed district what number of persons is from each of the existing districts. The number of persons from the district which contributes the largest population to the proposed district is divided by the population of the proposed district. The results for the individual districts are averaged to reach a result for the plan.

Since it would be very unusual to obtain a score below 50, the value assigned to the plan for Population Stability is determined by subtracting 50 points from the result of the mentioned calculation and multiplying the difference by 2.

For County Integrity, I compute the population contributed to each district by each county. From this, I determine the percentage of the population of the county which is assigned to each of the districts. Values included in the computation of the result for County Integrity are those which represent the populations of districts located entirely within a county and the largest remainder of the population of the county assigned to a district partly in the county. Then I determine the average of these percentages for each county. The results for the individual counties are averaged to reach a result for the plan. Since a value below 75 would be quite unusual, I subtract 75 from the result and multiply the difference by 4 to obtain the value assigned to the plan for County Integrity.

For Municipal Integrity, the process is identical to that for County Integrity, except that there are far more municipalities than counties and a much smaller proportion are likely to be divided among districts. In my experience in Texas, a value below 98 would be unusual, so I subtract 98 from the result of the calculation and multiply the difference by 50 to obtain the value assigned to the plan for Municipal Integrity.

For Compactness, due to programming issues, I had to use a substitute measure rather than my preferred measure. I computed a convex hull polygon which fully contains all inhabited blocks in a district This measure is a variant of the Schwartzberg method of evaluating compactness. The difference between Schwartzberg and the measure I use is that I do not consider unpopulated blocks as relevant to the determination of the compactness of a district. I compared the area of this convex hull with the actual area of the district and used the average of the results for the individual districts as the value assigned to the plan for Compactness.

For Concurrent Boundaries, I compute the perimeter of the district and the portion of the perimeter of the district which runs concurrently with county and municipal boundaries. I then calculate the percentage for each district and compute an average for all districts which I use as the value assigned to the plan for Concurrent Boundaries.

For Competitiveness, I determine the estimated number of votes in each proposed district for Democratic and Republican statewide candidates in recent elections (in this case, 2006 through 2010) based upon the official results for undivided counties and based upon the disaggregation, by Commission staff, of the precinct results in those contests to the census block level in divided counties. I make minor adjustments within the divided counties to assure that the sum of the totals for the districts within any county agrees with the official totals. For each proposed district, I determine the number of instances in which the result in the district falls within five percentage points of the result in the state. Any instance in which this is true is classified as a Competitive result for this test. If the variance is greater than five percentage points, the instance is classified as Democratic or Republican based upon the side on which the variance occurs. I sum the numbers of instances in each class and subtract the difference between the Republican and Democratic totals from the Competitive total. Then I divide the remainder by the total number of instances. This produces the value assigned to the plan for Competitiveness.

For Party Parity, I use the same results by district as for Competitiveness. For each proposed district, I compute the average percentage of the vote for the Republican and Democratic candidates in the elections mentioned. I then pair the districts, the district with the highest average Democratic percentage with the district with the highest Republican percentage and continue until all districts are paired. When the number of districts is odd, the last district stands alone unpaired. I exclude the one-third of these pairs which are least competitive. For each of the remaining pairs of districts, I compute the difference between the state average vote and the district average vote and then the difference between the two districts. I then determine the average difference for these district pairs, subtract that average difference from 100, subtract 95 from that difference and multiply the resulting difference by 20 to obtain the value assigned to the plan for Party Parity.

These principles and the formulas used to score them were developed in an effort to evaluate redistricting plans from the perspective of the ordinary voter, what serves the ordinary voter best. Although these principles and formulas were developed when I was working in other states, it is not a surprise that seven of these eight principles correspond to provisions of Washington state law governing the work of the redistricting commission. The only one which does not is the test for District Stability. However, it is clear from the comments of the commissioners when they presented their plans on September 13 that the extent to which voters are not displaced from the other voters with whom they commonly vote was a factor that deserved attention.

Prepared by John Milem
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