



QUANTIFYING THE LEVEL OF GERRYMANDERING IN MICHIGAN

This paper accompanies a longer paper, *Quantifying the Level of Gerrymandering in Michigan*. That paper is available at <https://crcmich.org/quantifying-the-level-of-gerrymandering-in-michigan/>.

In a Nutshell

- The U.S. Supreme Court has ruled that partisan gerrymandering is subject to judicial review, but has not accepted a standard that can be used to evaluate whether any state redistricting plan violates the U.S. Constitution.
- While the U.S. Supreme Court sent recent cases back to the District Courts, it is likely new cases will attempt to set a standard for how the courts should evaluate gerrymandering.
- Michigan's congressional and legislative district maps fail several tests that are currently being discussed to evaluate partisan gerrymandering.

Partisan gerrymandering is not a new phenomenon in the United States. State legislatures have tried to draw district maps to advantage the majority party since at least 1812, when Massachusetts Governor Elbridge Gerry's maps were lampooned, resulting in the term "Gerry-mander". But attempts to resolve gerrymandering through the courts are much more recent.

In 1986, the United States Supreme Court heard its first partisan gerrymandering case, *Davis v. Bandemer*. While the Court agreed that the issue of partisan gerrymandering was something that courts could resolve, they also ruled that the plaintiffs did not present a standard that provided acceptable evidence for the Court to overturn the maps. This charted the course for all partisan gerrymandering cases since; finding a standard that the Court deems acceptable is a necessary step to overturn a biased map.

With the U.S. Supreme Court recently sending two partisan gerrymandering cases back to the lower courts, political scientists are still looking for the holy grail of a court standard. Michigan is

one of several states that has had claims that its maps are gerrymandered. Republicans held unitary control of the state legislature during the 2001 and 2011 redistricting processes, and there have been claims Republicans have had a consistent electoral advantage. Based on available gerrymandering metrics, how do Michigan's congressional and legislative districts grade?

It turns out, not too well. A handful of tests show that Michigan's maps are beyond the threshold for what is considered gerrymandering, and show other signs that would indicate gerrymandering occurred.

The case regarding Wisconsin's State Assembly, *Gill v. Whitford*, hoped to test out one of several new metrics to evaluate gerrymandering, the **efficiency gap**, which calculates the frequency that a party 'wastes' votes. A wasted vote, according to the method, is a vote cast for a party that is not helpful in putting the candidate past 50 percent of the two-party share of votes. Any vote cast for a losing candidate, and any vote cast for a candidate after they receive a majority of the two-party vote share, is considered wasted by the metric. Each party's

total wasted votes for an office type (congressional, state house, or state senate) would then be summed and the difference is taken and divided by the total votes cast to create a metric that can be compared across different states and years.

Wasted votes line up well with the theories of **packing** and **cracking**, the two primary methods used to create a partisan gerrymander. When districts are packed, an overwhelming majority of voters from the same party are put into one district. As most of the votes go to one party, the party that wins the district will waste many of their votes in an election that is not close. If a district is cracked, it means that regions are split so that one party wins a large number of districts by a narrow margin. While the voters for the losing party in those districts could elect several candidates if they were districted fairly, they typically are unable to elect any candidate, and thus waste votes.

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for state legislative districts, and any value beyond 2 seats for congressional districts, would signify partisan bias.

Table 1 shows the efficiency gap scores for Michigan’s congressional, state house, and state senate districts, with a positive value indicating the maps favored Republicans and a negative value indicating the maps favored Democrats. For most years after the 2000s redistricting process, Michigan’s maps exhibited an efficiency gap that was beyond the test’s recommended threshold. The results also show areas of interest in election trends; in 2006, a year where Democrats saw more success at the ballot box in the state (including winning 54 percent of the statewide vote), Republicans maintained a 22-16 majority in the state senate.

The results also show a large increase in the efficiency gap after the 2010s redistricting process as well, with the efficiency gap more than doubling for congressional and state house districts between the last election under the 2000s map and the first election in the 2010s map, and the state senate

Table 1

Michigan’s Efficiency Gap for Congressional and Legislative Districts, 1998-2016

	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Congress	-9.7	6.6	15.2	11.5	23.5	8.0	5.6	19.7	17.6	14.6
MI House	8.1	11.9	11.0	9.7	11.6	8.2	5.8	13.6	13.3	10.1
MI Senate	9.6		10.2		18.5		14.7		22.6	

*See Appendix A for a discussion of the effects on the efficiency gap values of uncontested elections.

Note: The efficiency gap calculates the frequency that a party ‘wastes’ votes. A wasted vote, according to the method, is a vote cast for a party that is not helpful in putting the candidate past 50 percent of the two-party share of votes. Any vote cast for a losing candidate, and any vote cast for a candidate after they receive a majority of the two-party vote share, is considered wasted by the metric. Each party’s total wasted votes for an office type (congressional, state house, or state senate) would then be summed and the difference is taken and divided by the total votes cast to create a metric that can be compared across different states and years. The original creators of the efficiency gap recommended any score above an absolute value of eight would signal partisan bias beyond variability for state legislative districts, and any value beyond 2 seats for congressional districts, would signify partisan bias.

Source: Michigan Secretary of State voting data, Citizens Research Council calculations.

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efficiency gap increased to its highest point the first year the 2010s map was used. While year to year variation can exist in the efficiency gap due to population shifts, changes in voter turnout, and the popularity of candidates, the magnitude of these increases the first year the 2010s map was used is a strong indication that gerrymandering may have occurred. This is an especially important consideration, as the increase from map cycle to map cycle provides evidence that the levels are not entirely caused by the self-sorting of the state’s population (e.g., the idea that Democrats tend to live in cities and Republicans in rural areas).

While the efficiency gap is at the center of *Gill*, many are not enamored with the test, and several other alternatives have been offered. The **mean-median** test compares the average and median vote share of all districts for each party. If the median is higher than the mean, it indicates that the party has more districts above the party’s average vote share than below, which would make it easier for the party to win seats. Unlike the efficiency gap, this test does not take into account seats actually won, eliminating large swings in the metric that occur when a close district flips.

A positive mean-median score (indicating a higher median) is evidence that the party had an electoral advantage from the redistricting scheme, while a negative result would indicate a party was hindered

by the scheme. If a party has more than half of its districts above the party’s average vote share, it means that their populations are distributed so that they outperform their statewide average in more districts than they underperform. If the populations were distributed fairly, it is likely that the mean-median score would be close to zero. The national average mean-median score for states that showed no partisan advantage was 1.9 in 2012.

Michigan’s mean-median test results (see **Table 2**) paint a similar picture as the state’s efficiency gap results. The scores reflected an extreme advantage for Republicans the first three elections after the 2001 redistricting process, and a large increase in advantage for Republicans after the 2011 re-drawing of districts. Since 2001, only one year for one election type had a difference below five points, which indicates there has been a consistent partisan advantage due to the maps. The state’s congressional districts after the 2000s redistricting process show an extreme increase in the measure; switching from a slight bias for Democrats to an extreme advantage for Republicans.

These scores show that Republicans are consistently advantaged by the maps, while Democrats have been consistently disadvantaged. Because the mean-median test does not account for the number of seats won in any given year, the metric does not see as large of swings in the Democratic wave election

Table 2

Michigan’s Mean-Median Difference for Congressional and Legislative Districts, 1998-2016

		1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Congress	Republicans	-5.0	-4.0	12.4	10.3	10.1	3.9	1.6	6.3	7.4	7.8
	Democrats	5.1	4.4	-12.0	-10.2	-9.8	-5.0	-5.4	-6.9	-8.4	-7.8
MI House	Republicans	4.1	7.4	5.9	6.0	5.3	0.4	4.0	6.9	5.4	5.9
	Democrats	-5.0	-7.3	-6.4	-5.2	-4.6	0.4	-3.5	-6.5	-6.1	-5.6
MI Senate	Republicans	7.7		5.6		7.0		3.3		7.5	
	Democrats	-6.7		-5.3		-7.5		-8.6		-6.8	

Note: The mean-median test is a simple way to determine if a dataset is skewed, or not distributed normally across the average. To apply this test, the average vote share for a party across the state is subtracted from its vote share in the median district. A positive number (indicating a higher median) is evidence that the party had an electoral advantage from the redistricting scheme, while a negative result would indicate a party was hindered by the scheme.

Source: Michigan Secretary of State voting data, Citizens Research Council calculations.

in 2006 or the Republican wave election in 2010. Similar to the efficiency gap, the mean-median test shows a trend of an increase in partisan advantage under the 2010s maps.

The **t-test** is a statistical method to determine if two groups are likely to be assigned randomly from the same population. For evaluating gerrymandering, the test is used to compare the vote-share for each party. Districts are split based on the winning party, and given a value equal to the winner’s vote share. The test then determines the probability that the two groups of districts are statistically similar, or if they are distinct groups. Any results below .05, or 5 percent chance of the difference occurring randomly from the same group, is considered to be statistically significant evidence that the two populations are distinct.

If one party is winning districts by large margins, and the other wins several closer races, it can be an indication that some districts were intentionally designed to have an over-abundance of voters from one party, while others were drawn to give a narrow advantage to the opposite party. This test does not address the magnitude of gerrymandering, or which party benefited from gerrymandering, but is a good indicator of if the difference in district results is likely to have occurred by chance, or was intentional.

Results from the t-test (see **Table 3**) show that there are significant differences between the districts Republicans win and the districts Democrats win. Since the redistricting process in 2001, only two elections have had a t-test score above .05, which is

the threshold for the test. This would indicate that the margin of victory for the districts Republicans win, and the margin of victory for districts Democrats win, is different across congressional, state house, and state senate districts. When combined with the previous two tests, it would suggest that Republicans have had a consistent advantage in all election types.

These tests share one flaw; they do not account for how voters from each party are distributed throughout the state. As a result, these tests do not have a mechanism to distinguish abnormal scores due to highly concentrated Democratic populations, and intentional gerrymandering. An analysis by Jowei Chen and David Cottrell, professors at the University of Michigan and Dartmouth respectively, found that some of the bias in Michigan is due to the distribution of the state’s population, but the maps drawn in 2011 still produced an advantage for Republicans compared to the several congressional district schemes drawn by their algorithm. This would imply that, while the extent of gerrymandering implied by some of the tests may be exaggerated slightly, that political geography does not completely account for the bias in Michigan’s current congressional map.

The recent U.S. Supreme Court decisions leave open the question to how the courts will handle partisan gerrymandering cases in the future. While the Court avoided creating a new standard or ending the possibility of one being created, it seems likely that another case will eventually force the Court to decide on the issue of partisan gerrymandering. Until then, Michiganders will have to evaluate what to do about gerrymandering without the federal court system.

Table 3
Michigan’s T-Test Results

	1998	2000	2002	2004	2006	2008	2010	2012	2014	2016
Congress	0.195	0.060	0.004	0.005	0.000	0.055	0.394	0.002	0.005	0.009
MI House	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.000	0.000
MI Senate	0.069		0.019		0.000		0.006		0.000	

Note: The T-Test is a statistical method to determine if two groups are likely to be assigned randomly from the same population. Districts are split based on the winning party, and given a value equal to the winner’s vote share. The test then determines the probability that the two groups of districts are statistically similar, or if they are distinct groups. Any results below .05, or 5 percent chance of the difference occurring randomly from the same group, is considered to be statistically significant evidence that the two populations are distinct.

Source: Michigan Secretary of State voting data, Citizens Research Council calculations.

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