

Partisan Fairness of the Pennsylvania Legislative Reapportionment Commission's Proposed State House Districting Plan

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My Background

- JD/PhD from Stanford University
- Currently an Associate Professor of Political Science at George Washington University
- Research focuses on political representation, redistricting, elections, and public opinion. In all, I have written 24 peer reviewed articles and I have a book coming out this summer called *Dynamic Democracy: Public Opinion, Elections, and Policy Making in the American States*.

Roadmap

- Methodology
 - ▶ Project future elections based on three different approaches
 - ▶ Evaluate partisan fairness using four different metrics
- Results
 - ▶ All of my analyses indicate that the plan is fair with just a small pro-Republican bias

Projecting Future Elections

I use three different approaches to project future election results on the new map:

1 Composite of statewide elections from 2014-2020

- ▶ Includes: 2016 Presidential, 2020 Presidential, 2014 Governor, 2018 Governor, 2016 Attorney General, 2020 Attorney General, 2016 Senate, 2018 Senate, 2016 Treasurer, 2020 Treasurer, 2016 Auditor General, and 2020 Auditor General election.
- ▶ I average results within year and then across years.

2 2020 State House elections

- ▶ Impute uncontested elections based on the 2020 presidential election results.

3 PlanScore.org

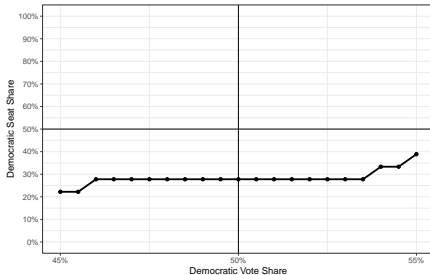
- ▶ Statistical model that predicts results on a new plan based on the relationship between presidential election results and legislative election results around the country over the past decade.

Partisan fairness

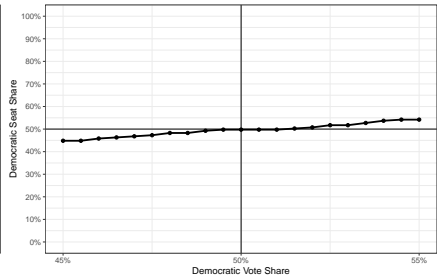
I use four different generally accepted academic approaches to evaluate the partisan fairness of the plan.

- 1 Symmetry
- 2 Mean-Median Difference
- 3 Efficiency Gap
- 4 Declination

1) Symmetry

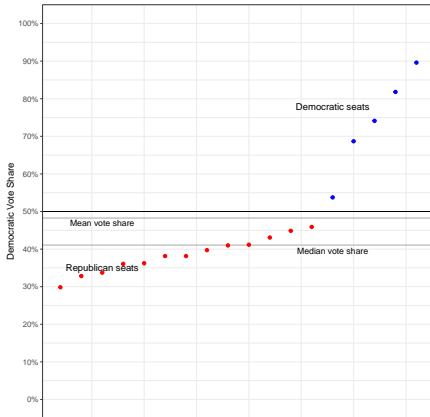


(a) Biased, Pro-Rep. symmetry on 2016 US House Map

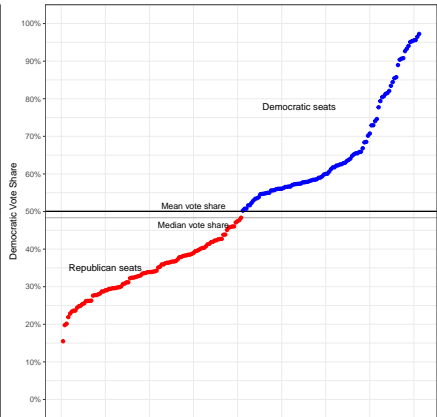


(b) Relatively neutral symmetry on Proposed LRC State House Map

2) Mean-Median Difference



(a) Biased, Pro-Rep. mean-median difference on 2016 US House Map



(b) Relatively neutral mean-median diff. on Proposed LRC State House Map

3) Efficiency Gap

Table: Hypothetical Example of Efficiency Gap

District	Democratic Votes	Republican Votes
1	75	25
2	40	60
3	40	60
Total	155 (52%)	145 (48%)
Wasted	104	43

Plan	Efficiency Gap
Hypothetical Example	-20%

3) Efficiency Gap

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2016 Congressional Election	-19%

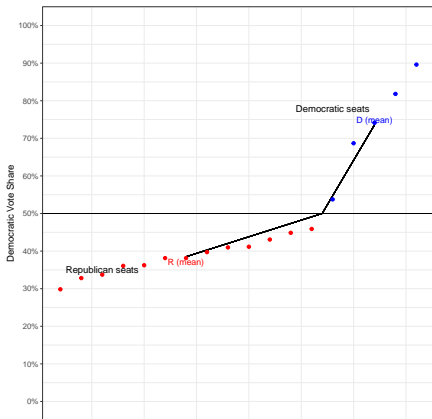
3) Efficiency Gap

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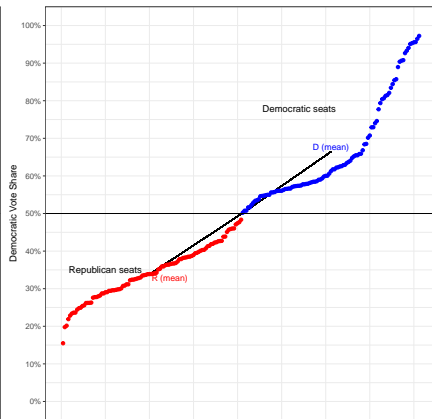
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Plan	Efficiency Gap
Hypothetical Example	-20%
2016 Congressional Election	-19%
LRC Plan based on 2020 State House Election	0.7%

4) Declination

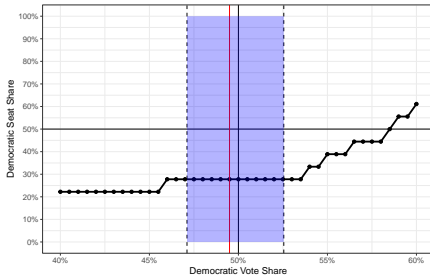


(a) Biased, Pro-Rep. declination on 2016 US House Map

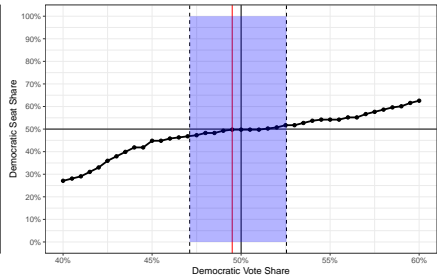


(b) Relatively neutral declination on Proposed LRC State House Map

Responsiveness



(a) Unresponsive
2016 US House Map



(b) Relatively Responsive
Proposed LRC State House Map

Composite of previous statewide elections from 2014-2020

Metric	Value	2014-2020 Composite		
		> Biased than this % Elections (1972-2020)	> Neutral than this % Elections (1972-2020)	> Pro-Rep. than this % Elections (1972-2020)
2014-2020 Plan				
Republican Vote Share	46%			
Republican Seat Share	49%			
Symmetry Bias	-7.7%	77%	23%	85%
Mean-Median	-3.8%	70%	30%	81%
Efficiency Gap	-5.8%	60%	40%	83%
Declination	-.348	66%	34%	82%
Average		68%	32%	83%
Proposed Plan				
Republican Vote Share	46%			
Republican Seat Share	46%			
Symmetry Bias	-2.5%	29%	71%	61%
Mean-Median	-1.4%	31%	69%	63%
Efficiency Gap	-2.6%	27%	73%	69%
Declination	-.175	38%	62%	65%
Average		31%	69%	65%

The preliminary LRC plan is relatively neutral with a small pro-Republican bias based on the composite of statewide elections.

2020 State House election results

Metric	Value	More Biased than this % Historical Elections (1972-2020)	> Neutral than this % Elections (1972-2020)	More Pro-Rep. than this % Historical Elections (1972-2020)
2014-2020 Plan				
Republican Vote Share	50%			
Republican Seat Share	56%			
Symmetry Bias	-5.7%	60%	40%	77%
Mean-Median Diff	-4.3%	79%	21%	86%
Efficiency Gap	-4.8%	49%	51%	78%
Declination	-.36	68%	32%	83%
Average		64%	36%	81%
Proposed Plan				
Republican Vote Share	50%			
Republican Seat Share	50%			
Symmetry Bias	-0.2%	2%	98%	49%
Mean-Median Diff	-1.9%	40%	60%	68%
Efficiency Gap	0.7%	8%	92%	51%
Declination	-.04	9%	91%	50%
Average		15%	85%	55%

The preliminary LRC plan is politically neutral based on the 2020 State House election results.

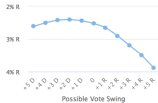
PlanScore

Efficiency Gap: 2.5% R



Votes for Republican candidates are expected to be inefficient at a rate 2.5% R lower than votes for Democratic candidates, favoring Republicans in 95% of predicted scenarios." [Learn more >](#)

Sensitivity Testing



Sensitivity testing shows us a plan's expected efficiency gap given a range of possible vote swings. It lets us evaluate the durability of a plan's skew. [Learn more >](#)

Declination: 0.15 R



The difference between mean Democratic vote share in Democratic districts and mean Republican vote share in Republican districts along with the relative fraction of seats won by each party leads to a declination that favors Republicans in 95% of predicted scenarios." [Learn more >](#)

Partisan Bias: 2.5% R



Republicans would be expected to win 2.5% R extra seats in a hypothetical, perfectly tied election, favoring Republicans in 95% of predicted scenarios." [Learn more >](#)

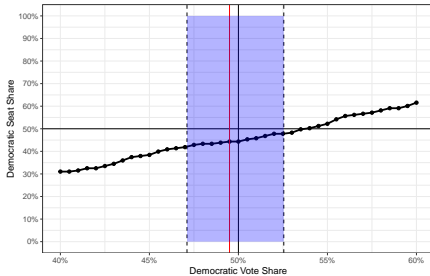
Mean-Median Difference: 1.2% R



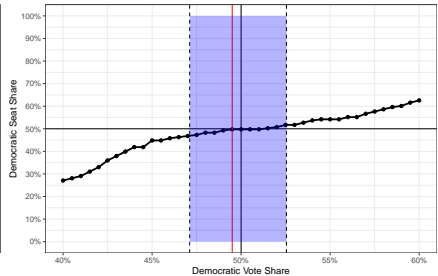
The median Republican vote share is expected to be 1.2% R higher than the mean Republican vote share, favoring Republicans in 95% of predicted scenarios." [Learn more >](#)

The preliminary LRC plan is relatively neutral with a small pro-Republican bias based on the PlanScore.org website.

Responsiveness of Proposed Plan



(a) 2014-20 State House Map



(b) Proposed State House Map

The preliminary LRC plan is responsive to shifts in mass preferences and the party that gets a majority of votes would usually get a majority of the seats.

Number of Competitive Districts

Data:	2020 State House Results	Composite (2014-20)	PlanScore			Mean
Metric:	45-55	45-55	45-55	20%+ Prob. of Each Party Win.	50%+ Prob. Flip in Dec.	
Plan	(1)	(2)	(3)	(4)	(5)	(6)
Average Nationwide in 2020	13%					
2014-20 Plan	13%	24%	23%	20%	25%	21%
Proposed Plan	12%	21%	23%	18%	23%	19%

The preliminary LRC plan and the 2014-2020 plan are very similar in terms of the proportion of competitive seats. The LRC plan also has roughly the same percentage of seats that are competitive as other states' elections for their lower chambers in 2020.

Conclusion

- The plan is likely to be responsive to shifts in voters' preferences.
- On this plan, the party that wins the majority of the votes is likely to usually win the majority of the seats.
- Based on three methods of projecting future elections and four different, generally accepted partisan bias metrics, I find that the plan is fair, with just a small pro-Republican bias.