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Peer reviewed publications that focus on partisan bias.

Election Law Journal 20 (2021) 116-138 with A. Ramsay @ **DRA**
On **Measuring Two-Party Partisan Bias** in Unbalanced States

Election Law Journal 14, 346-360 (2015)
Measures of Partisan Bias for Legislating Fair Elections

Election Law Journal 18 (2019) 63-77.
What Criteria Should Be Used for Redistricting Reform?

Election Law Journal 16, 196-209 (2017).
How competitive should a fair single member districting plan be?

The LRC proposed house map is biased in favor of Republicans.



Bias Measures

This used President 2016 & 2020 election data set
50.15% 2-party D vote

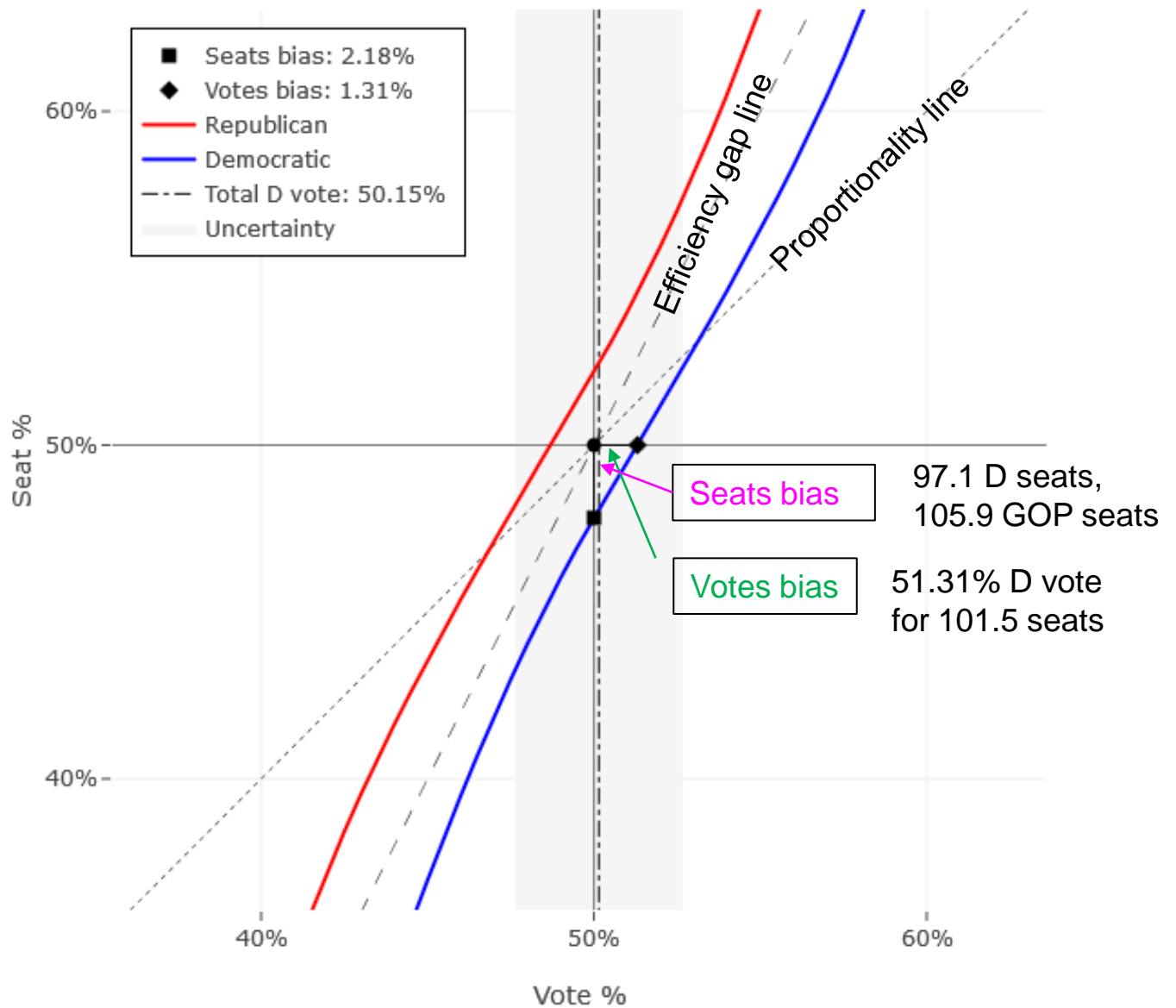
These are some prominent measures of partisan bias.

Metric		Description	
• Proportional	2.08%	The simple deviation from proportionality using fractional seat shares	
• Efficiency gap	2.23%	The relative two-party difference in wasted votes	
• Gamma	2.18%	The fair difference in seats at the map-wide vote share	My invention
• Seats bias	2.18%	Half the difference in seats at 50% vote share	→ 97.1 D seats, 105.9 GOP seats
• Votes bias	1.31%	The excess votes required for half the seats	→ 51.31% D vote for 101.5 seats
• Partisan bias	2.19%	The difference in seats between the map-wide vote share and the symmetrical counterfactual sh	
• Global symmetry	2.71%	The overall symmetry of the seats-votes curve	My invention
• Partisan bias rating	71	The combined rating of seats bias & votes bias	
• Declination	5.47°	A geometric measure of packing & cracking	
• Mean–median	1.87%	The average vote share across all districts minus the median vote share	



Seats-Votes Curve: Copy of LRC-House-Preliminary Map

Uses Presidential 2016 and 2020 election data $V = 50.15\%$



Seats Bias 2.18

Proportionality 2.08

Efficiency gap 2.23

Partisan Bias 2.19

About the same when $V = 50.15\%$
Identical @ 50%

Votes Bias 1.31%
Mean-median

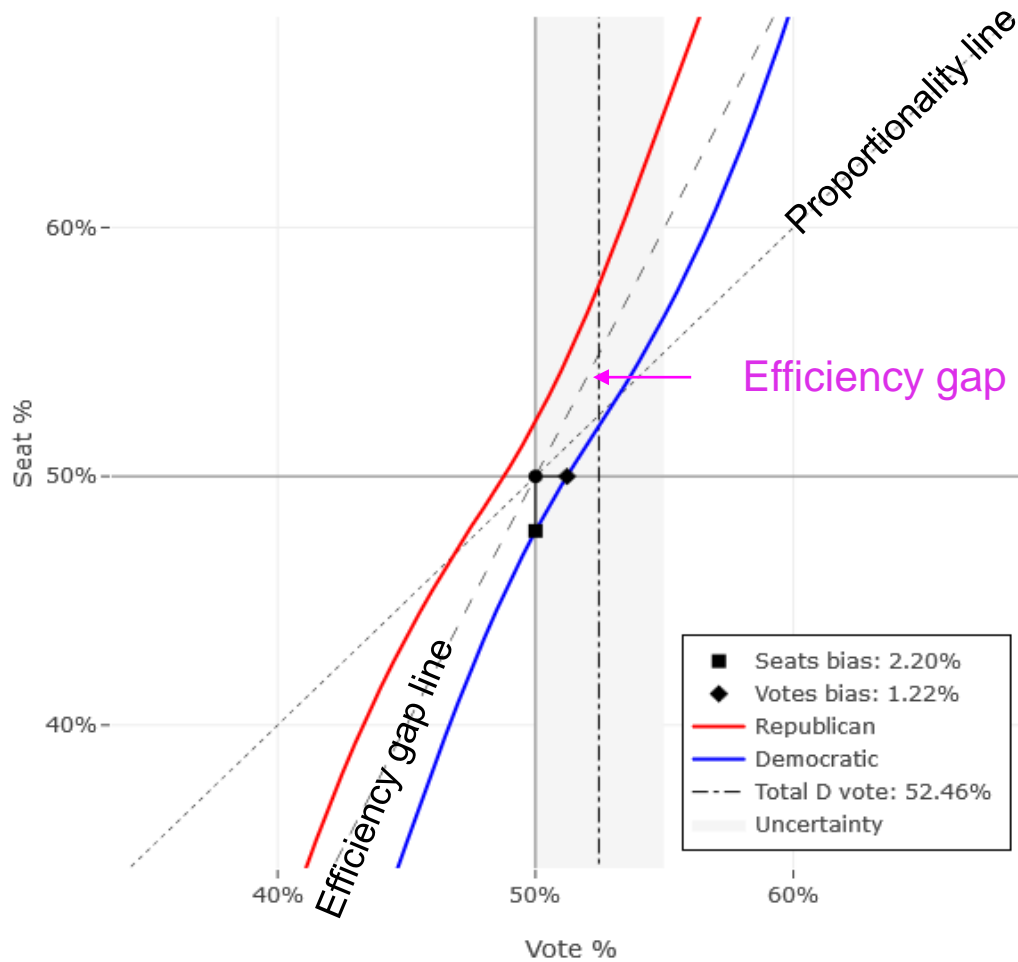
Seats bias: 97.1 D seats, 105.9 GOP seats

Votes bias: 51.31% D vote for 101.5 seats



Seats-Votes Curve: Copy of LRC-House-Preliminary Map

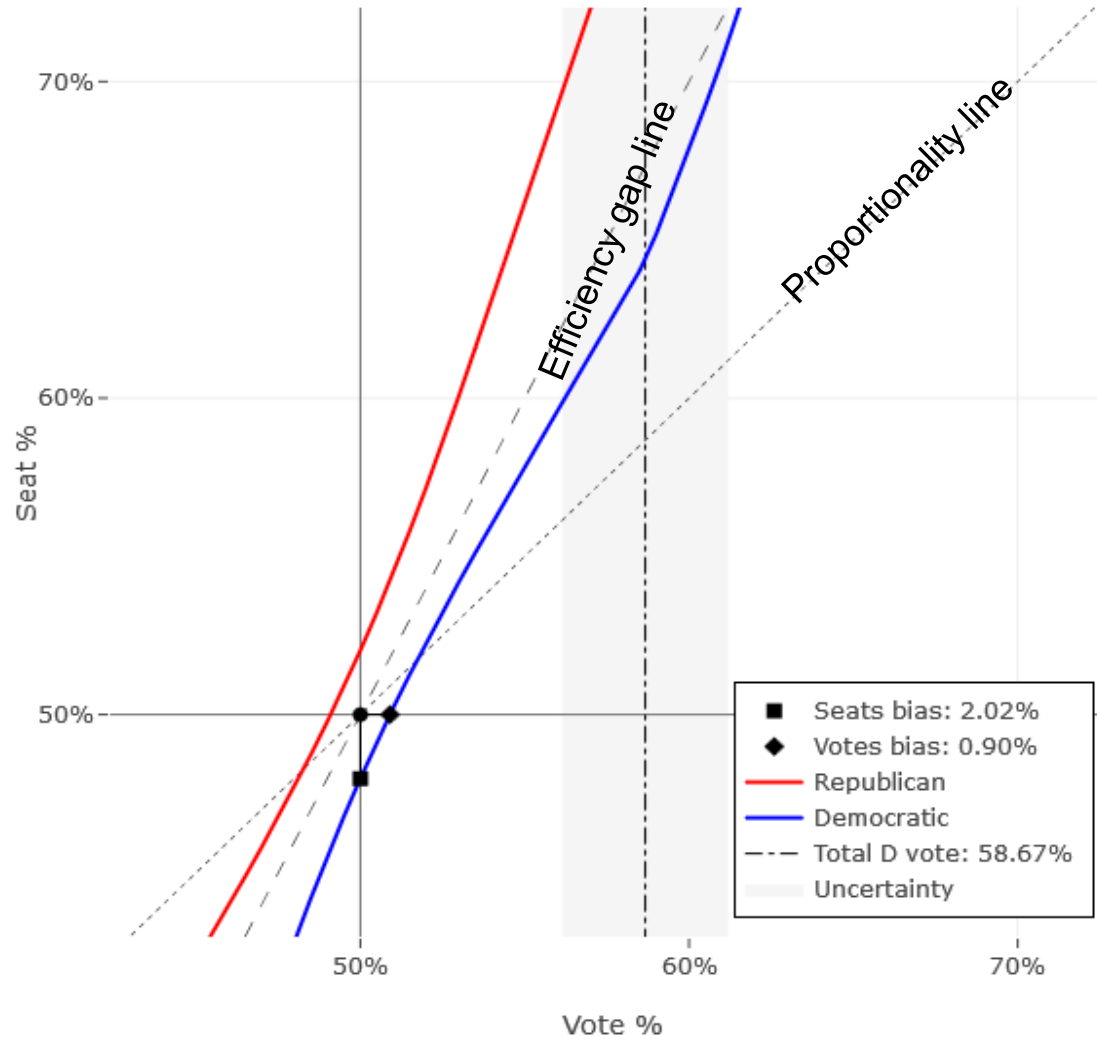
DRA composite election data D Vote = 52.46%



- Seats Bias 2.20
- Proportionality 0.50
- Efficiency gap 2.95
- “Partisan Bias” 2.86
- Global Symmetry 2.74

Proportional seats at 52.46% D vote. But look at seats for same GOP vote.

Governor 2018 election data D Vote = 58.67%



Seats Bias 2.02
Proportionality -5.66
Efficiency gap 3.01
Local Symmetry 6.36
Global Symmetry 2.98

What is the best vote to use for analysis of bias in PA?



What is the best vote for analysis of bias?

Difficult question for unbalanced states like MA or SC.

But PA is a well balanced, purple state, especially for house elections

Election Year	D vote all HDs	R vote all HDs	D vote 2-party %
2020	3017689	3416942	46.9
2018	2568968	2075093	55.3
2016	2755058	2852921	49.1
2014	1408624	1825181	43.6
averages	2437585	2542534	48.9

Answer for PA: Only need to look at seats bias because it is evaluated at 50% 2-party vote, and the other metrics agree at 50%.



What about other data sets?

Election Data	Vote V%	D Seats @V%	Seats Bias	D Seats @ V =50%	Votes Bias
DRA Composite	52.46	105.6	2.20	97.0	1.22
President 16&20	50.15	97.6	2.18	97.1	1.31
President 20	50.60	101.5	1.06	99.3	0.61
Att General 20	52.33	105.3	0.30	100.9	0.16
President 16	49.62	92.6	3.53	94.3	2.15
Senate 16	49.25	85.3	5.97	89.4	2.73
Senate 18	56.57	118.3	2.55	96.3	1.27
Governor 18	58.67	130.0	2.02	97.4	0.90
average of all	52.46	104.5	2.48	96.5	1.29
standard deviation	3.44	14.1	1.71	3.5	0.82



Critique of Dr. Barber's report.

Dr. M. Barber histogram

Comparison to 50,000 simulated plans in the PA House:
(drawn with population equality, compactness, and minimal political subdivision splits)

Evaluated using election data with greater than 52.5% Dem vote.

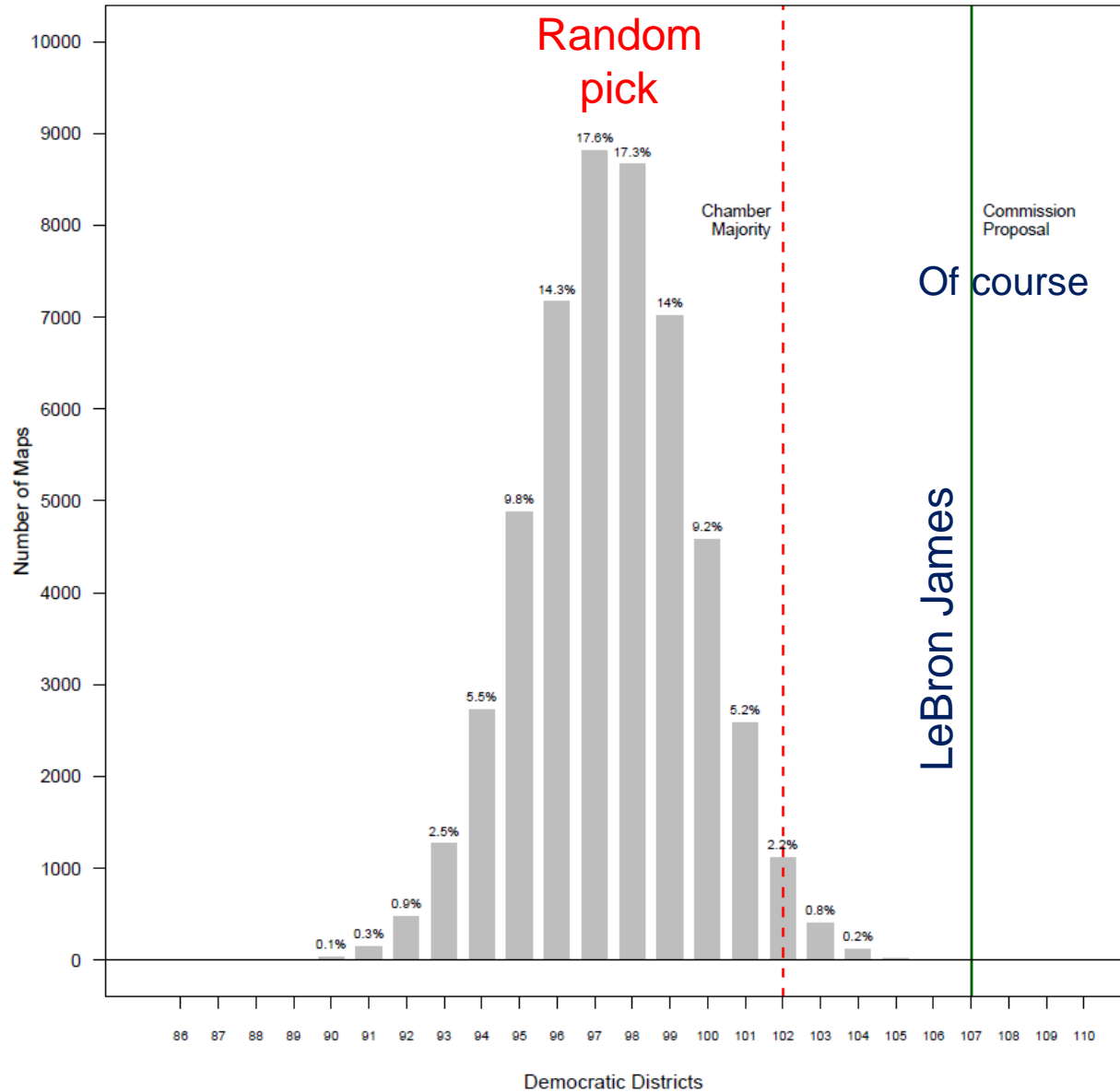
Why are simulated plans so biased?

Geopolitical bias

Of all legal maps

Two options are

- A. Pick a random one
- B. Pick the fairest one



Of course

LeBron James

Commission Proposal



Conclusions

1. The LRC proposed house plan is biased in favor of Republicans by about 2% → 106 R seats vs 97 D seats with 50% vote.

Why should the GOP be upset? The current plan is three times as biased as the LRC proposed plan.

Why shouldn't Dems be upset? Rules, political geography and competing criteria preclude making an even fairer plan.

2. Dr. Barber's simulations do not support his contrary opinion that the plan favors Democrats.

After generating lots of plans, by computer, by the public, or by committee, that satisfy the legal requirements, do not choose one that mimics a computer ensemble, but one that is fairest to voters by minimizing partisan bias, both intentional bias and unintentional geopolitical bias. Where people live should not nullify equal representation of their political viewpoint.

Thank you for listening.

