Assessing the Fairness of the Distribution of Electoral College Votes

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Each state is given a number of Electoral College (EC) votes based on their population, but how proportional is it? Which states are under- and over-represented? And ultimately, is there a party that benefits from the Electoral College system when it comes to Presidential elections?

To analyze the proportion, I needed 2 tables with a list of states that included:

- Population
  - https://en.wikipedia.org/wiki/2020_United_States_census\
- EC votes
  - https://www.britannica.com/topic/United-States-Electoral-College-Votes-by-State-1787124

I used Excel to create these 2 tables, and join them.

I created a calculated column for *Population per EC vote* to determine the ratio:

$$\frac{State\ population}{EC\ votes}$$

By sorting in ascending order, the list goes from most over-represented to most under-represented.

State	Pop. per EC Vote	EC Votes	Population
Wyoming	**192,284**	3	576,851
[…]	[…]	[…]	[…]
Texas	**766,987**	38	29,145,505

Wyoming: most over-represented

Texas: most under-represented

I was also curious to see how the EC votes would differ if it was distributed proportionally to the population. To do this, I used the *median state* as a guideline:

State	Pop. per EC Vote	EC Votes	Population
Oklahoma	565,622	7	3,959,353

To recalculate each states' EC votes based on median state's proportion, I used the cross-multiply method:

$$\frac{median\ state's\ population}{median\ state's\ EC\ votes} = \frac{other\ state's\ population}{adjusted\ state\ EC\ votes}$$

And created a calculated field: $\frac{(7 * Other\ state's\ population)}{3{,}959{,}353}$

I added another table that lists each state's *lean rating*, showing if they are more likely to vote more Democrat, Republican, or Toss-up/competitive obtained from:

- https://www.realclearpolitics.com/epolls/2020/president/2020_elections_electoral_college_map.html

With this list, in conjunction with each state's original and adjusted EC votes, I was able to calculate the following:

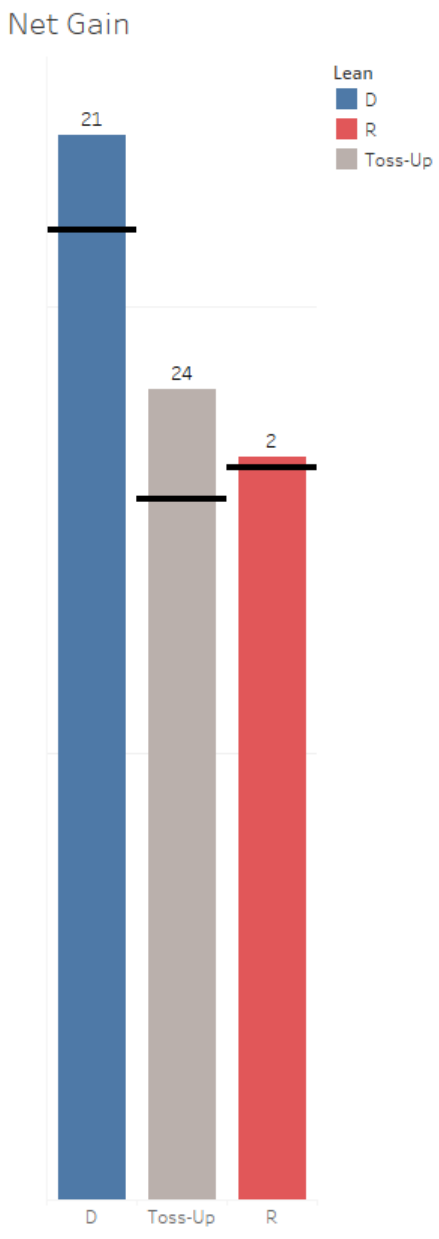
Adjusted

Lean	EC Votes	Adjusted	Difference
D	217	238	21
R	164	166	2
Toss-Up	157	181	24
Grand Total	538	586	48

State-by-state Breakdown

Adjusted EC Votes - by State

Lean	State	EC Votes	Adjusted	Difference
Grand Total		538	586	48
D	Total	217	238	21
	California	55	70	15
	New York	29	36	7
	Illinois	20	23	3
	New Jersey	14	16	2
	Virginia	13	15	2
	Washington	12	14	2
	Massachusetts	11	12	1
	Colorado	9	10	1
	Maryland	10	11	1
	Oregon	7	7	0
	Connecticut	7	6	-1
	Delaware	3	2	-1
	New Mexico	5	4	-1
	Hawaii	4	3	-1
	New Hampshire	4	2	-2
	Maine	4	2	-2
	District of Columbia	3	1	-2
	Vermont	3	1	-2
	Rhode Island	4	2	-2
R	Total	164	166	2
	Texas	38	52	14
	Tennessee	11	12	1
	Indiana	11	12	1
	Missouri	10	11	1
	Louisiana	8	8	0
	South Carolina	9	9	0
	Oklahoma	7	7	0
	Kentucky	8	8	0
	Alabama	9	9	0
	Utah	6	6	0
	Arkansas	6	5	-1
	Idaho	4	3	-1
	Mississippi	6	5	-1
	Kansas	6	5	-1
	Montana	3	2	-1
	South Dakota	3	2	-1
	Nebraska	5	3	-2
	North Dakota	3	1	-2
	Alaska	3	1	-2
	West Virginia	5	3	-2
	Wyoming	3	1	-2
Toss-Up	Total	157	181	24
	Florida	29	38	9
	North Carolina	15	18	3
	Pennsylvania	20	23	3
	Georgia	16	19	3
	Ohio	18	21	3
	Michigan	16	18	2
	Arizona	11	13	2
	Wisconsin	10	10	0
	Minnesota	10	10	0
	Iowa	6	6	0
	Nevada	6	5	-1



Observations:

- Democratic States: 9 states would gain votes, 9 states would lose votes, with a net of **+21 votes.**
  - **California –** the state that would gain the most EC votes at **+15**.
- Republican States: 4 states would gain votes, 11 states would lose votes, with a net of **+2 votes.**
  - **Texas (+14 votes) –** the **only** Republican state that would gain more than 1 vote.
- Overall EC votes went up, by **48 votes***, totaling 586 – which means a party would need to secure **294 votes** to win.
- **Democratic** (+21 votes) and **Toss-up** (+24 votes) states would benefit the most if EC votes were calculated proportionally.

**due to rounding, the accurate number is 47.99 – however, 294 votes to win remains the same*

<u>In the original race to 270 EC votes:</u>

Lean Democratic states: 217 / 270 votes = **80.37%** of votes considered as secured

Lean Republican states: 164 / 270 votes = **60.74%** of votes considered as secured

Difference: **19.63% gap** between the 2 parties

<u>In the adjusted race to 294 EC votes:</u>

Lean Democratic states: 238 / 294 votes = **80.95%** of votes considered as secured

Lean Republican states: 166 / 294 votes = **56.76%** of votes considered as secured

Difference: **24.19% gap** between the 2 parties

Conclusion:

Democratic Party would benefit by having a net *increase* of **0.58%** of votes secured.

Republican Party would be at a disadvantage, by having a net *decrease* of **3.98%** votes secured, widening their gap from the Democrats from 19.63% to 24.19%, a 4.96% difference.

Based on this analysis, the current Electoral College system **benefits the Republican Party** because Democratic states' EC votes are not proportional. Because the adjusted EC votes adds more votes in Democratic states, the Republican Party's overall ratio in secured votes would **decrease**. Furthermore, abolishing this system *completely* and switching to the normal "most popular vote wins" would encourage presidential candidates to appeal to all states rather than having focusing only on competitive/swing states, enabling individuals from **all** states to have their voices heard, no matter how blue or red the state is.