The Impact of Close Races on Electoral College and Popular Vote Conflicts in US Presidential Elections

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In two of the past five United States Presidential elections, the winner of the national Popular Vote has lost the Electoral College. It can be contended that this dynamic is essentially lightning striking twice in the same place, and that future conflicts between the Electoral College and the Popular Vote are unlikely. However, by simulating future Presidential elections based on current trends, we discover very different results. We determine that **if we continue to see close Presidential races, over 30% of elections in the next century are likely to select a President against the will of the majority of voters.** As Presidential elections have been getting closer, the probability of an Electoral College / Popular Vote ("EC/PV") clash has been rising -- this trend is likely to continue. Therefore, unless the electorate becomes less polarized and less lopsided, EC/PV splits will become an ongoing, frequent occurrence in Presidential elections.

While a probability as large as 30% may be surprising and counterintuitive, an understanding of the battleground state dynamic created by the Electoral College makes it more intuitive. The combination of state-segmented electors and winner-take-all dynamics effectively reduce the Presidential election to a handful of states. Every state that isn't a battleground isn't really relevant, except when elections are lopsided. In close elections, candidates must abandon the pursuit of the majority of voters overall and focus on the handful that are likely to provide them an Electoral College victory. As data and targeting become better, constrained resources must focus on critical voters, leaving the rest of the country as observers. In close elections, we don't know who will effectively persuade the majority of people. But with the Electoral College, we have an additional layer of uncertainty: we also have no idea whether the right Electoral College combination will be held by the same person. In extremely close elections, the probability of a clash between the popular vote and the Electoral College approaches a coin flip.

This dynamic can be true even when the popular vote is merely "close-ish". We saw this story play out in 2000, when a popular vote margin of 500,000 was reversed by 537 votes in Florida, or more recently in 2016 when a 2.8 million vote margin was overcome by less than 80,000 voters across the rust belt. As close, hard-fought elections persist, we will continue to see rampant conflicts between the Electoral College selection and the will of the majority of voters.

In addition, both recent observed instances of a clash between the Electoral College and the popular vote have featured a Democrat winning the popular vote and a Republican winning the Electoral College. Current circumstances favor a Republican winner of the Electoral College in the event of a clash, but this advantage is not systematic or persistent throughout multiple elections. For future elections, it is difficult to predict whether EC/PV clashes will advantage Democrats or Republicans.

1. The probability of a clash between the Electoral College and the Popular Vote has been rising substantially.

To realistically predict the probability of a EC/PV split in a near-future Presidential election, we use Monte Carlo methods with 50,000 iterations to simulate a range of election outcomes. By simulating the election repeatedly, we can estimate the likelihood of a clash as the number of times a clash occurs in our simulations over the total number of simulations. The large number of simulations also allows us to investigate specific behavior in detail such as how the likelihood of a split changes as a function of the popular vote margin. Each simulation includes independent variables which can vary on a state-by-state basis:

- Portion of undecided voters: the portion of the overall electorate uncommitted to either party's candidate. We simulate this from a truncated normal distribution (to assure that the level of undecided voters will always lie between 0 and 1) with a mean of 10% and a standard error of 2.5%, so that 95% of the time the number of undecided voters will lie between 5% and 15% of the general electorate. Crucially, we assume that this level of undecided voters is the same across all states[1].
- Vote share of undecided voters won by each party: draw the democratic vote share of undecideds from a uniform distribution bounded between 40% and 60%, with the Republican party winning 1 minus that share.
- Vote share of decided voters won by each party: assume that the vote share won by each party (we vary Democratic party share, with the Republican party winning 1 minus that share) follows a truncated multivariate Student T distribution with 9 degrees of freedom and with cutoff points between 0 and 1 to ensure that the simulated vote shares never exceed the theoretical bounds. The multivariate distribution allows us to simultaneously draw all 50 states and the District of Columbia to incorporate correlations between them for more realistic results.

For simplicity's sake, we ignore third-party candidates and fix voter turnout rates at 2016 levels.[2] We also quickly determined that the portion of undecided voters in any given state does not significantly impact the probability of an EC/PV split, except in that it affects the vote share won by each party.

Using this model, we can estimate the baseline probability of a split using historical election results from 1980-2016.[3] **Generically, we would expect the chance of an Electoral College popular vote split to occur about 8% of the time across all elections regardless of popular vote margin**. This probability is slightly smaller than the observed frequency of clashes over the course of American history but is a reasonable probability based on the limited number of observations.

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[1] Empirically this assumptions seems reasonable. The 2016 CCES showed that the level of undecided voters was fairly consistent across states at generally around 10% in each state with a few ranging towards 15%.

[2] We separately determine that these two variables do not significantly impact the probability of a EC/PV split. Allowing turnout to vary according to past elections has no major impact on the results, and the impact of third parties is effectively the same as making the election closer, so we capture the effect of third parties in the simulations already.

[3] We start with 1980 because that is deemed to be the latest start date of the sixth party system in some political circles. See Michael Kazin, et al. eds, *The Princeton Encyclopedia of American Political History* (2009) Vol. 2 p. 288. Using earlier election data may create bias due to political party realignment.

While there are many factors that impact the probability of an EC/PV split, we wish to determine the highest-probability cause behind the recent dramatic rise in split probability.

2. Recent elections have been dramatically closer, increasing the overall probability of a clash.

Presidential elections in the last 30 years have been unusually close. During that timeframe, the popular vote margin of victory has averaged 4.8% of the electorate. For the 30 years prior, the average popular vote margin was 11.5%, and averaged 9.4% since the popular vote was first tallied in 1824. While the more distant past has held extremely close elections (Kennedy v Nixon, Garfield v Hancock), close elections are a recent, consistent trend.

Close elections also have a significant impact on the probability of a EC/PV split. The likelihood of a clash rises dramatically as the popular vote narrows, meaning that as an election becomes closer, this probability of a EC/PV split rises substantially.

To visualize the impact, We plot the probability of a clash as a function of the popular vote margin, with positive values indicating popular vote victories for the Democratic party, negative values indicating Republican victories, and 0 being an exactly tied popular vote[4]. As the percent difference narrows close to zero, the chance of a split rises dramatically to above 40% in some years. Moreover, we see that for most year the peaks are relatively symmetrical, indicating that both parties are generally equally likely to win the popular vote and lose the Electoral College given a sufficiently tight race.

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[4] Note that no simulated popular vote margins are actually 0%. Results at zero only appear as a consequence of rounding to the nearest tenth (margins with an absolute value less than 0.5% get rounded down to 0%).

Chance of EV-PV Split vs. Popular Vote Margin by Election Year
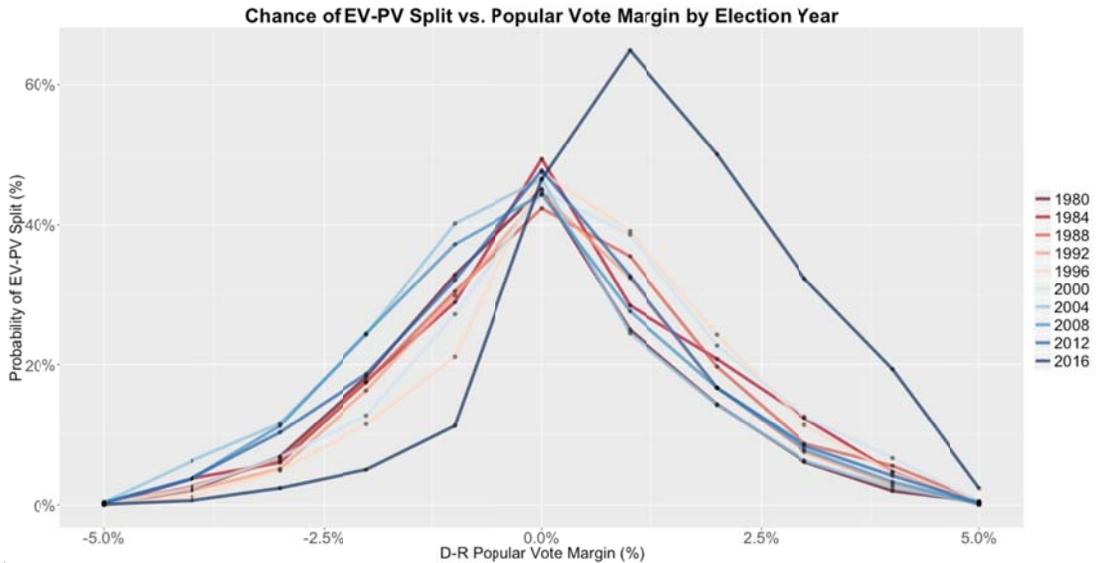
If we assume the trend of close elections will continue, our working assumption for the overall probability of a EC/PV split must also increase. Given a close election we expect that the likelihood of a popular vote electoral vote split will be substantially higher than our generic models above indicate. The table below shows our expectations for the likelihood of a EC/PV split in elections over the next few decades from 2016-2060 as a function of the popular vote margin, accounting for population trends in each state.

	Overall	<=4% Popular Vote Margin	<=2% Popular Vote Margin
Probability of EC/PV Clash (using all historical data)	8%	21%	**32%**
Probability of EC/PV Clash (using 2016 data)	14%	30%	**40%**

3. The Electoral College currently favors the Republican Party in the event of a EC/PV clash, but current circumstances are likely ephemeral.

To determine the probability of a Republican or a Democrat winning the White House in the event of a EC/PV clash, we use historical voting patterns in each state and assume a correlation among states -- if Georgia swings heavily red in any given election, it is more likely that North Carolina will as well. We derive these correlations from historical voting patterns. We then evaluate the simulated outcomes of elections for each election year to determine the probability of each party winning the Presidency in the event of a clash.

The plot below demonstrates both the significant present advantage held by Republicans in the event of a clash and the ephemerality of that advantage. While recent memory dominates present views on which party will win the White House in the event of an EC/PV split, neither party appears to have a sustained advantage under those circumstances.

Simulated Probability of Split Given Electoral Vote Winner
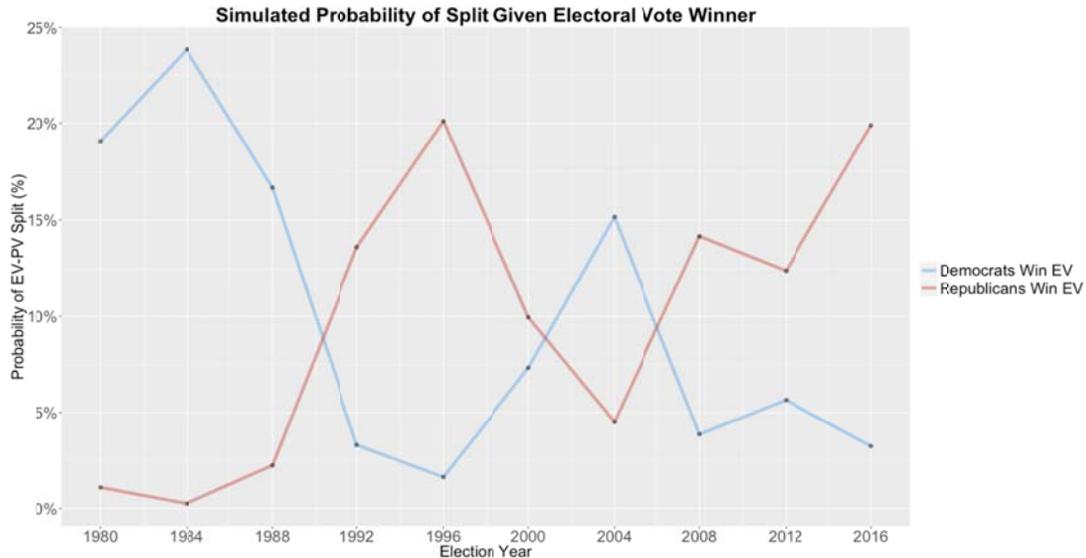
While the two recent occurrences have both swung towards Republicans in the White House, we do not find a basis for predicting the recurrence of those events.

Conclusion

In both recent occurrences of an EC/PV split during US Presidential elections, the popular narrative has largely written off the events as relatively unlikely and harmless features of an Electoral College system designed by the Founding Fathers. Today's reality is much different. Due to increasingly close elections, the formerly unlikely probability of an EC/PV clash is becoming an increasingly prominent feature in today's Presidential elections. We've seen a split occur twice in the last five elections, and we're likely to see it again in the near future. Because of the nature of today's elections, we must re-evaluate whether this is a dynamic that the Founders intended.