What We Can Learn from The Banzhaf Power Indexes of Battleground States

Liam Collins
Dr. Aaron Trocki
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Elon University

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Introduction

The 2016 Presidential election shook up a lot of what we knew about political theory and campaign predictability, but one of the biggest changes as we understand it is the electoral college map. Traditional 'battleground states' like Virginia and North Carolina look much more solid, while states like Michigan and Pennsylvania, that have historically been much more reliable for Democrats are looking much more competitive. Going into the 2020 Presidential campaign, how the two major-party candidates share their time among battleground states and the political decisions that are made in their respective campaigns as a result of the electoral map could be the difference between re-electing Donald Trump and making him a one-term president. In order to do this, we need to understand the Banzhaf Power Index of the most competitive states in the union.

The Banzhaf Power index determines the power in a weighted voting system for each individual player based on whether or not each respective coalition would have the opportunity to win if that player was not in that coalition. Because each state has a different number of electoral votes, the political emphasis placed on each of these states is different based on that state's votes, as well as how likely each candidate is to flip that state into their column. As we've seen multiple times in the past, a presidential election can come down to the results of a handful of states, so it's important to understand how they behave.

Why should we care about the Banzhaf Power Indexes of battleground states? The more information we have on what states really have the most power in the electoral college, the more information we can use in determining how campaigns should be sharing their time among the battleground states. Not only just that, but it can also help us to predict what political decisions

each campaign may make based on these indexes, and help us retrospectively analyze where past candidates went right or wrong in their respective strategies.

To do this, I will be dividing all 50 states, plus the District of Columbia into three categories: Safe republican states, safe Democratic states, and battleground states. This will allow me to calculate the electoral votes each candidate would be guaranteed under this determination. Then, I will calculate the possible coalitions to put either candidate over the edge at 270 electoral votes, and what states would be considered critical, meaning that state flipping to the other candidate would change the results of the election. To do this, I will be using Temple University's online Banzhaf Power Index Calculator. Using this calculation, I will then determine each state's Banzhaf Power Index. I will finish out this paper by explaining the implications this information could have politically when parties, campaigns, and candidates make decisions on how they should format their strategies.

Diminishing Factors

Because presidential elections are very complicated and there are a lot of factors that could sway the election one way or another, there are multiple different factors I have to count out. First, other political predictability categories. Indeed, as we have seen there are more than these three categories in determining political predictability of states (Gimpel et al, 2007). There are 'Lean States' and 'Solid States' as well, but for simplicity sake, I will operate under the assumption that any state that leans or tilts one way or another will fall into that party's category.

I will also operate under the assumption that no third-party or independent candidate will be able to win any state's electoral votes.

Maine and Nebraska are the only two states that do not award their state's electoral votes on a wholly "winner-takes-all" basis, they award most of their electoral votes to the candidate

who won the state as a whole, but they also give one of their electoral votes to the candidate who won the majority of their congressional districts. This can be the same candidate, or it cannot be, but either way, I will be assuming that all of Maine and Nebraska's electoral votes goes to one candidate.

Lastly, of course, some states do not bound their electors to vote for the candidate who won the state. In some states, like Texas for example, any elector can vote for anyone they want when it comes to the actual electoral college vote. I will be operating in a way that assumes that each elector votes for the candidate who won that state.

Determining Battleground States

Indeed, determining the status of all 50 states plus the District of Columbia is not as scientifically binding as one might hope, given that the political landscape of each individual state has changed dramatically over the years. But a system to accommodate the current political bounds of each individual state is needed in this research. After aggregating the methods of other authors, the method that seems to be the most effective, straightforward and produced the most statistically significant result was Gimpel (2007)'s method. To determine battleground status, I will take the difference of the last three presidential elections in each state, using the results from each state's board of elections offices, and average the difference between the two parties. Differently from Gimpel's method, however, I will only be using presidential elections where neither candidate was an incumbent, to diminish any account of incumbency advantage in this case. Any state with a five-point or lower difference between the two candidates will be deemed as a battleground state, and any other state will be considered a "Safe Republican" or a "Safe Democratic" State, respectively. Figure 1 shows the results from using this calculation. The more

negative an index, the more likely it would fall into the Democratic category, and the more positive an index, the more likely it would fall into the Republican category.

STATE	CLINTON	TRUMP	DIFFERENCE	OBAMA	MCCAIN	DIFFERENCE	BUSH	GORE	DIFFERENCE	AVERAGE	ELECTORAL VOTES
Alabama	34.36%	62.08%	27.72%	38.74%	60.32%	21.58%	56.48%	41.57%	14.91%	21.40%	9
Alaska	36.55%	51.28%	14.73%	37.89%	59.42%	21.53%	58.62%	27.67%	30.95%	22.40%	3
Arizona	45.13%	48.67%	3.54%	45.12%	53.64%	8.52%	51.02%	44.73%	6.29%	6.12%	11
Arkansas	33.65%	60.57%	26.92%	38.86%	58.72%	19.86%	51.31%	45.86%	5.45%	17.41%	6
California	61.73%	31.62%	-30.11%	61.01%	36.95%	-24.06%	41.65%	53.45%	-11.80%	-21.99%	55
Colorado	48.16%	43.25%	-4.91%	53.66%	44.71%	-8.95%	50.75%	42.39%	8.36%	-1.83%	9
Connecticut	54.57%	40.93%	-13.64%	60.59%	38.22%	-22.37%	38.44%	55.91%	-17.47%	-17.83%	7
Delaware	53.09%	41.72%	-11.37%	61.94%	36.95%	-24.99%	41.90%	54.96%	-13.06%	-16.47%	3
District of Columbi	90.48%	4.07%	-86.41%	92.46%	6.53%	-85.93%	8.95%	85.16%	-76.21%	-82.85%	3
Florida	47.82%	49.02%	1.20%	51.03%	48.22%	-2.81%	48.85%	48.84%	0.01%	-0.53%	29
Georgia	45.64%	50.77%	5.13%	46.99%	52.20%	5.21%	54.67%	42.98%	11.69%	7.34%	16
Hawaii	62.22%	30.03%	-32.19%	71.85%	26.58%	-45.27%	37.46%	55.79%	-18.33%	-31.93%	4
Idaho	27.49%	59.26%	31.77%	36.09%	61.52%	25.43%	67.17%	27.64%	39.53%	32.24%	4
Illinois	55.83%	38.76%	-17.07%	61.92%	36.78%	-25.14%	42.58%	54.60%	-12.02%	-18.08%	20
Indiana	37.91%	56.82%	18.91%	49.95%	48.91%	-1.04%	56.65%	41.01%	15.64%	11.17%	11
Iowa	41.74%	51.15%	9.41%	53.93%	44.39%	-9.54%	48.22%	48.54%	-0.32%	-0.15%	6
Kansas	36.05%	56.65%	20.60%	41.65%	56.61%	14.96%	58.04%	37.24%	20.80%	18.79%	6
Kentucky	32.68%	62.52%	29.84%	41.17%	57.40%	16.23%	56.50%	41.37%	15.13%	20.40%	8
Louisiana	38.45%	58.09%	19.64%	39.93%	58.56%	18.63%	52.55%	44.88%	7.67%	15.31%	8
Maine (at-lg)	47.83%	44.87%	-2.96%	57.71%	40.38%	-17.33%	43.97%	49.09%	-5.12%	-8.47%	4
Maryland	60.33%	33.91%	-26.42%	61.92%	36.47%	-25.45%	40.18%	56.57%	-16.39%	-22.75%	10
Massachusetts	60.01%	32.81%	-27.20%	61.80%	35.99%	-25.81%	32.50%	59.80%	-27.30%	-26.77%	11
Michigan	47.27%	47.50%	0.23%	57.43%	40.96%	-16.47%	46.15%	51.28%	-5.13%	-7.12%	16
Minnesota	46.44%	44.92%	-1.52%	54.06%	43.82%	-10.24%	45.50%	47.91%	-2.41%	-4.72%	10
Mississinni	40.11%	57.94%	17.83%	43.00%	56.18%	13.18%	57.62%	40.70%	16.92%	15.98%	6
Missouri	38.14%	56.77%	18.63%	49.29%	49.43%	0.14%	50.42%	47.08%	3.34%	7.37%	10
Montana	35.75%	56.17%	20.42%	47.25%	49.51%	2.26%	58.44%	33.36%	25.08%	15.92%	3
Nebraska (at-lg)	33.70%	58.75%	25.05%	41.60%	56.53%	14.93%	62.25%	33.25%	29.00%	22.99%	5
Nevada	47.92%	45.50%	-2.42%	55.15%	42.65%	-12.50%	49.52%	45.98%	3.54%	-3.79%	6
New Hampshire	46.98%	46.61%	-0.37%	54.13%	44.52%	-9.61%	48.07%	46.80%	1.27%	-2.90%	4
New Jersey	54.99%	41.00%	-13.99%	57.27%	41.70%	-15.57%	40.29%	56.13%	-15.84%	-15.13%	14
New Mexico	48.26%	40.04%	-8.22%	56.91%	41.78%	-15.13%	47.85%	47.91%	-0.06%	-7.80%	5
New York	59.01%	36.52%	-22.49%	62.88%	36.03%	-26.85%	35.23%	60.21%	-24.98%	-24.77%	29
North Carolina	46.17%	49.83%	3.66%	49.70%	49.38%	-0.32%	56.03%	43.20%	12.83%	5.39%	15
North Dakota	27.23%	62.96%	35.73%	44.62%	53.25%	8.63%	60.66%	33.06%	27.60%	23.99%	3
Ohio	43.56%	51.69%	8.13%	51.50%	46.91%	-4.59%	49.97%	46.46%	3.51%	2.35%	18
Oklahoma	28.93%	65.32%	36.39%	34.35%	65.65%	31.30%	60.31%	38.43%	21.88%	29.86%	7
Oregon	50.07%	39.09%	-10.98%	56.75%	40.40%	-16.35%	46.52%	46.96%	-0.44%	-9.26%	7
Pennsylvania	47.46%	48.18%	0.72%	54.49%	44.17%	-10.32%	46.43%	50.60%	-4.17%	-4.59%	20
Rhode Island	54.41%	38.90%	-15.51%	62.86%	35.06%	-27.80%	31.91%	60.99%	-29.08%	-24.13%	4
South Carolina	40.67%	54.94%	14.27%	44.90%	53.87%	8.97%	56.84%	40.90%	15.94%	13.06%	9
South Dakota	31.74%	61.53%	29.79%	44.75%	53.16%	8.41%	60.30%	37.56%	22.74%	20.31%	3
Tennessee	34.72%	60.72%	26.00%	41.83%	56.90%	15.07%	51.15%	47.28%	3.87%	14.98%	11
Texas	43.24%	52.23%	8.99%	43.68%	55.45%	11.77%	59.30%	37.98%	21.32%	14.03%	38
Utah	27.46%	45.54%	18.08%	34.41%	62.58%	28.17%	66.83%	26.34%	40.49%	28.91%	6
Vermont	56.68%	30.27%	-26.41%	67.46%	30.45%	-37.01%	40.70%	50.63%	-9.93%	-24.45%	3
Virginia	49.73%	44.41%	-5.32%	52.63%	46.33%	-6.30%	52.47%	44.44%	8.03%	-1.20%	13
Washington	52.54%	36.83%	-15.71%	57.65%	40.48%	-17.17%	44.58%	50.16%	-5.58%	-12.82%	12
West Virginia	26.43%	68.50%	42.07%	42.59%	55.71%	13.12%	51.92%	45.59%	6.33%	20.51%	5
Wisconsin	46.45%	47.22%	0.77%	56.22%	42.31%	-13.91%	47.61%	47.83%	-0.22%	-4.45%	10
Wyoming	21.63%	67.40%	45.77%	32.54%	64.78%	32.24%	67.76%	27.70%	40.06%	39.36%	3

Figure 1

After using this calculation method, I determined the list of official battleground states, for the purposes of this research, to be: Colorado, Florida, Iowa, Minnesota, Nevada, New Hampshire, North Carolina, Ohio, Pennsylvania, Virginia and Wisconsin. Although North Carolina's political average was 5.39%, I rounded this number down to 5% for the purposes of this research. This means that the "Safe Republican" States include: Alabama, Alaska, Arizona, Arkansas, Georgia, Idaho, Indiana, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, West Virginia and Wyoming.

This brings our hypothetical Republican nominee to a guaranteed 191 electoral votes, with just 79 needed to win the presidency. The "Safe Democratic" States include: California, Connecticut, Delaware, D.C., Hawaii, Illinois, Maine, Maryland, Massachusetts, Michigan, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont and Washington. This would bring our hypothetical Democratic nominee to a guaranteed 207 electoral votes, with just 63 needed to win the presidency. As you can see, a hypothetical Democratic candidate would have a fair advantage under this model.

Banzhaf Power Index

Because of the large amount of coalitions possible in this research, I chose to use Temple University's online Banzhaf Power Index Calculator to calculate the Banzhaf Power Index of the two states. We're dealing here with two different political parties with two different totals of guaranteed electoral votes. Therefore, there are two different quotas that the coalitions would have to reach in order to calculate the coalitions that could give a Republican candidate the presidency, and a Democratic candidate the presidency, I had to run the calculations twice with two different quotas. The list I used to calculate the Banzhaf Power Index of a Republican candidate is as follows:

[79: 29, 20, 18, 15, 13, 10, 10, 9, 6, 6, 4]

Again, as I calculated which states would be considered battleground states, I found that a Republican candidate would be guaranteed 191 of the 270 electoral votes needed to win, which means that a Republican candidate would need to win 79 of the 107 possible electoral votes of battleground states in order to win the presidency. Figure 2 shows the distribution of power among the battleground states.

The list I used to calculate the Banzhaf Power Index of a Democratic candidate is as follows:

[63: 29, 20, 18, 15, 13, 10, 10, 9, 6, 6, 4]

As I calculated the electoral votes guaranteed to a Democratic candidate, I found that they were guaranteed 207 electoral votes, meaning they would need only an additional 63 electoral votes to win the presidency. Figure 2 shows the distribution of power among the battleground states.

Analysis

STATE	ELECTORAL VOTE	R BPI	R POWER	D BPI	D POWER	TOTAL BPI	TOTAL POWER
FL	29	1010	22.66%	1030	22.82%	2040	22.74%
PA	20	630	14.13%	650	14.40%	1280	14.27%
OH	18	570	12.79%	566	12.54%	1136	12.66%
NC	15	470	10.54%	478	10.59%	948	10.57%
VA	13	402	9.02%	386	8.55%	788	8.78%
MN	10	306	6.86%	310	6.87%	616	6.87%
WI	10	306	6.86%	310	6.87%	616	6.87%
CO	9	278	6.24%	274	6.07%	552	6.15%
IA	6	182	4.08%	198	4.39%	380	4.24%
NV	6	182	4.08%	198	4.39%	380	4.24%
NH	4	122	2.74%	114	2.53%	236	2.63%
TOTAL	**140**	**4458**	**100.00%**	**4514**	**100.00%**	**8972**	**100.00%**

Figure 2

Evidently, Florida shares a significant amount more power in the index than does the other states. Florida shares about 22.74% of the total Banzhaf Power available in this system, over 8% more than the next top state. Significant, considering Florida only has about 6% more of the total electoral vote share than the next largest state, Pennsylvania.

Indeed, as supported by these calculations, it can be properly asserted that smaller battleground states in the electoral college do have more power, as Hively (2004)'s research suggests. In his research, Hively argues in favor of the electoral college off of the evidence that one votes goes a lot further in smaller electorates, and that the founders of the Constitution likely created this system in order to advance that. The calculations here do support that, at least in part.

For example, New Hampshire only has four electoral votes, sharing a miniscule .74% of the total electoral college votes available. However, when taking political considerations into account, New Hampshire's power in the electoral college jumps nearly 2% to 2.63%. However, other considerations to consider is whether that is true for all states. Evidently, no it is not true. For the purposes of this research, I assumed that a state like Delaware or Montana, both with three electoral votes, have no power at all. So clearly, this is not true for all small states, by accounts of this research, only the competitive ones like New Hampshire.

We should be able to mostly predict the political decisions that campaigns make in forming their strategies based on these results, assuming that they strictly base their decisions off of the Banzhaf Power Index. We know, of course, that there are multiple different factors that affect campaign decisions. However, we should expect certain decisions to be made at least in consideration with the state's Banzhaf Power Indexes: campaign visits and Vice-Presidential selections.

Campaign Visits

We should expect campaigns to allocate their resources as appropriate to the Banzhaf Power Index of their respective campaigns. There is plenty of research determining whether campaign activity actually sways a voters' mind. For the sake of this research, I will operate under the assumption that the campaign visits do have a significant impact. The research, however, does support my assumption. According to Gimpel (2007), time and contact with voters appears to be one of the most influential resources allocated when trying to increase voter turnout, specifically among lower-income voters. The research found that lower-income voters, traditionally grappled with a very low voter turnout, are more likely to participate politically if they live in battleground states. Gimpel found that the reason for that was because they were

more exposed to the campaign because the candidates had much more visits there. In accordance with this research, allocating an appropriate amount of time in each state in accordance with their respective Banzhaf Power Indexes would be considered a proper allocation of resources. Strictly based on the calculations I made about each states, we should expect for each 2020 candidate to spend that amount of time in the respective state to allocate their amount of resources in accordance with the amount of power that state holds in the electoral college.

We may also be able to look retrospectively at the strategies of the 2016 presidential candidates, and whether their electoral strategies lined up with the Banzhaf Power Indexes of their campaigns. This information could help us better understand if using this strategy helped Donald Trump win, and if not using this strategy contributed to Hillary Clinton's loss. To do this, I used information provided by A*BC News* to aggregate the total number of days spent at the battleground states I determined and if the share of time spent at each of these states lined up with the Banzhaf Power Index I determined for each of the states. Figure 3 shows the relationship between the Banzhaf Power Index for each individual state and the time Donald Trump and Hillary Clinton spent in each state since gaining enough delegates in their respective primaries to be considered their party's nominees. For Donald Trump, that day was May 26th, 2016 and for Hillary Clinton that day was June 7th, 2016 (Smith & Kreutz, 2016). The more positive the difference, the more time they spent in that state in comparison to the state's BPI, and the more negative the difference, the less time they spent in that state in comparison to the states' BPI. I used the median index to determine how much time they spent in total in comparison to the state's BPI.

STATE	R BPI	R POWER	TRUMP VISITS	TRUMP INDEX	DIFFERENCE	D BPI	D POWER	CLINTON VISITS	CLINTON INDEX	DIFFERENCE
FL	1010	22.66%	19	17.76%	**-4.90%**	1030	22.82%	15	19.74%	**-3.08%**
PA	630	14.13%	14	13.08%	**-1.05%**	650	14.40%	15	19.74%	**5.34%**
OH	570	12.79%	17	15.89%	**3.10%**	566	12.54%	15	19.74%	**7.20%**
NC	470	10.54%	15	14.02%	**3.48%**	478	10.59%	11	14.47%	**3.88%**
VA	402	9.02%	10	9.35%	**0.33%**	386	8.55%	2	2.63%	**-5.92%**
MN	306	6.86%	1	0.93%	**-5.93%**	310	6.87%	1	1.32%	**-5.55%**
WI	306	6.86%	5	4.67%	**-2.19%**	310	6.87%	0	0.00%	**-6.87%**
CO	278	6.24%	7	6.54%	**0.30%**	274	6.07%	3	3.95%	**-2.12%**
IA	182	4.08%	6	5.61%	**1.53%**	198	4.39%	4	5.26%	**0.88%**
NV	182	4.08%	4	3.74%	**-0.34%**	198	4.39%	6	7.89%	**3.51%**
NH	122	2.74%	9	8.41%	**5.67%**	114	2.53%	4	5.26%	**2.74%**
TOTAL	4458	6.86%	107	8.41%	**1.55%**	4514	6.87%	76	5.26%	**-1.60%**

Figure 3

As we now know, Donald Trump was able to secure the 270 electoral college votes needed to win the presidency. His campaign's Banzhaf Power Index could shed some light on this. As figure 3 shows, Donald Trump spent proportionally more time in battleground states in comparison to his campaign's Banzhaf Power Index by about 1.55%. Hillary Clinton, on the other hand, spent less time in battleground states in comparison to her campaign's Banzhaf Power Index. Interestingly enough, however, among the states that he won, only in Wisconsin and Iowa did Donald Trump spend more of a share of his time in comparison to his campaign's BPI than did his opponent in comparison to her campaign's BPI. In all other states that he ended up winning, Donald Trump spent less of a share of his time in comparison to his campaign's BPI than his opponent in comparison to her campaign's BPI. Also interestingly, among the states that she ended up winning, only in Minnesota and Nevada did Hillary Clinton spend more time in comparison to her state's BPI than her opponent spent in comparison to his campaign's BPI.

Of course, we also know that there is much more that goes into a campaign's strategy than just how much power a state has and how much time each campaign should allocate to that state as a result. If a state is more competitive, which I did not take into consideration in this research, then a campaign is of course going to spend much more time in that state because they have more at stake.

For example, as figure 1 shows, Minnesota has the largest swing to the Democratic candidate according to its political competitivity index. Both candidates have roughly the same

amount of lower shared time in that state despite the state's BPI being about less than 7% for both campaigns. The lower amount of shared time is likely due to both campaign's acknowledgement that the state is likely to fall into Hillary Clinton's category. Whereas, states like Iowa, with a relatively low BPI of about 4% for both campaigns are much more competitive and both campaigns likely saw it as much more likely to swing either way, so both campaigns spent more time in these states relative to their campaign's BPI.

'Veepstakes'

Another huge decision parties, campaigns, and candidates need to make which we would expect to line up with the Banzhaf Power Index of each respective candidate is their Vice Presidential pick. It is very well-understood that a major consideration in deciding a Vice Presidential candidate is whether that candidate would add any electoral votes to the ticket. Of course, this is not the only consideration. This was made evidently clear in 2008 when both campaigns picked Vice Presidential candidates from states with small electoral votes and low electoral competitiveness (Barack Obama chose Senator Joe Biden from Delaware, a solidly blue state with only three electoral votes, and John McCain chose Governor Sarah Palin from Alaska, a solidly red state also with only three electoral votes). Needless to say, there are multiple different considerations to be made when the nominee picks a Vice Presidential candidate: Regional & political balance, loyalty, demographics, media exposure, and experience, to name a few (Baumgartner, 2008).

That doesn't mean that the electoral benefits of adding a Vice Presidential candidate from a larger, more competitive state should go unnoticed. Vice Presidential picks tend to come from larger states. Baumgartner (2008) stated in his research that the share of states' electoral college vote is almost twice as much as the average state, emphasizing the importance of an electoral

benefit that a Vice Presidential candidate should bring to the table. The research has shown that this factor does contribute to the selection of the Vice-Presidential candidate; Presidential candidates have carried the home states of their Vice Presidential candidates 71% of the time since 1960 (Baumgartner, 2008).

We should also use this research to determine if Hillary Clinton and Donald Trump's use of this strategy played in their favor or not. By doing a simple google search, I used the top trending news article about Trump & Clinton's Vice-Presidential shortlist to compile a list of whom they were reportedly considering for their tickets.

According to a *Fortune* article, Trump was reportedly considering Indiana Governor Mike Pence, New Jersey Governor Chris Christie, Former House Speaker Newt Gingrich of Georgia, Senator Joni Ernst of Iowa, Senator Jeff Sessions of Alabama, and Senator Bob Corker of Tennessee. Strictly taking into consideration each state's BPI, we should have expected Trump to select Senator Joni Ernst for his running mate considering Iowa has a BPI of . We know now, however, that was not the case. Although, allegedly, Ernst was asked by Trump to be on the ticket, but she turned him down (Bever, 2019). If this is true, then I would then have to consider, for the purposes of this research, whether Trump's ultimate choice of Indiana Governor Mike Pence was the best decision in accordance with his campaign's Banzhaf Power Index. With Ernst out of the running, we are left with five candidates from non-competitive states. Therefore, we should look at which state has the most electoral votes, for the purposes of this research. Ultimately, with Georgia's 16 electoral votes to Indiana's 11 electoral votes, it should be assumed that Former House Speaker Newt Gingrich would have been a better choice if the only consideration was the electoral college. However, as mentioned earlier, there are many other factors to consider in selecting a running mate.

As for Hillary Clinton's shortlist, *NBC News* reported in July of 2016 that she was reportedly considering Senator Tim Kaine of Virginia, Secretary Tom Vilsack of Iowa, Secretary Tom Perez of Maryland, Senator Elizabeth Warren of Massachusetts, Secretary Julián Castro of Texas, Colorado Governor John Hickenlooper, Senator Cory Booker of New Jersey, and Senator Sherrod Brown of Ohio. Strictly taking into consideration each state's BPI, we should have expected Clinton to select Senator Sherrod Brown for her running mate. Ohio has a BPI of 12.54%, the highest of any of the states listed here. However, it is highly likely that Clinton's campaign took into consideration some political issues that could have arose from that selection. Ohio's governor at the time was Republican John Kasich. If Clinton had selected Brown as her running mate, then it would have forced Kasich to nominate a new senator to replace him. It is highly likely that, if Clinton and Brown had won the election, Kasich would have chosen a Republican senator, complicating the political balance in the upper chamber of Congress. Assuming that this was a consideration for the Clinton campaign, the math suggests that Clinton's ultimate choice of selecting Senator Tim Kaine was the right one, given Virginia's BPI of 8.55%.

Conclusion

In conclusion, understanding the Banzhaf Power Index of battleground states can, indeed, help us to make certain predictions about political strategies in presidential elections. Because the Banzhaf Power Index helps us understand the power that each battleground state has in the electoral college, we should expect campaigns to allocate their resources and make their strategies accordingly. This research shows that the Banzhaf Power Index of the battleground states defined in this research not only helped us to predict some of the political strategies made by presidential candidates, but also helped us to explain retrospectively why the 2016

presidential election went the way it did. The Banzhaf Power Index gave us a share of time that Donald Trump and Hillary Clinton should have spent in each battleground state. I found that Donald Trump, at median, over shared his time in comparison to his campaign's BPI, while Hillary Clinton under shared her time in comparison to her campaign's BPI. Although I did find, interestingly, that in most of the states that ultimately ended up in Trump and Clinton's respective categories, the opponent spent more time in that state than the ultimate winner did. I also took into consideration whether a state with a higher BPI is more likely to produce a Vice Presidential candidate. This research finds this to be true. Although neither candidate from a state with the highest BPI according to each candidate's shortlist was ultimately selected, there were critical political considerations at play for both the Republican and Democratic candidates' selection process. If it is true that Senator Joni Ernst was Donald Trump's first choice but Ernst turned Trump down, and if it is true that Hillary Clinton likely did not fully consider Senator Sherrod Brown because he came from a state with a Republican Governor, then it would support my assertion that the candidate from the state with the highest Banzhaf Power Index should be selected as a Vice Presidential candidate. Taken at face value, however, only Hillary Clinton's ultimate choice for Vice President supports this research.

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