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HOW TO WIN AN ELECTION

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ABSTRACT

What is the best way to spend money on an election? While it may seem the best to spend campaign funds on furthering your campaign through advertising, the most optimal way to win an election may be to spend on other candidates. This project is a political science project based on the idea that using campaign funds on other candidates may be the best way to win an election. The outcome of this can be that candidates match up better against one candidate rather than the other due to factors such as charisma, career experience, and position in politics. An example of this is that funds may go to a candidate that is more radical politically while the candidate spending the money is more moderate. Therefore, the more moderate candidate will appeal to a much wider audience and therefore win rather than going against another moderate candidate. This idea will be based around Game Theory and using statistical models to showcase this idea. This strategy is something not commonly used, but hopefully, this project showcases the effectiveness of this unorthodox method.

ACKNOWLEDGEMENTS

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Introduction

What is the best way to win an election? A common answer would be to spend money on advertising their campaign to as many people as they can. Another would be by hosting public events, to create a bond with the voters. A morally corrupt person may say to rig the election, to guarantee an election win. While those are all indeed answers that have worked before, one answer that is never heard is "spending money on one of your candidates to boost their campaign". That simply seems like blasphemy, why would someone spend their own resources and funds to help another candidate? As will be shown through this project, the perfect candidate doesn't always win, rather it depends on the scenario they are placed in.

The purpose of this project is to investigate alternative methods to winning an election and what causes these methods to exist. All too often in Political Science, statistics and models are ignored as Political Science is looked at as more of cerebral study which relies on theories. This project attempts to showcase the benefit of these methods to utilize models to their fullest potential. Once those methods have been looked through, the project will rely on game theory and statistical models to mimic the behaviors of voters in an election to see how feasible these methods are. Once the models are made, they will be analyzed to determine the validity of these scenarios moving from theoretical to real life application and any tweaks that need to be made. By the end of this process, there were three models that were intertwined to illustrate the unique quirks of the electoral system.

Before we can begin discussing the models and methods, we must also answer first what is game theory. Game Theory as defined by Britannica is "a branch of applied mathematics that provides tools for analyzing situations in which parties, called players, make decisions that are interdependent. This interdependence causes each player to consider the other player's possible

decisions, or strategies, in formulating strategy. A solution to a game describes the optimal decisions of the players, who may have similar, opposed, or mixed interests, and the outcomes that may result from these decisions." (Davis & Brams) To put simply, game theory is the use of models to attempt to predict what people would do in a scenario. A famous example of this would be the prisoner's dilemma, a game which was meant to simulate the behavior of criminals being accused of a crime. Due to how the game is situated, though it's theoretically best for both players to stay quiet and get the shortest amount of time sentenced for each other, the rational player would always choose to throw their fellow criminal under the bus even if it possibly harms themselves. These models are useful for this project as they can be used to predict both voter and candidate's behavior by simulating what a person would do in their shoes by having someone attempt to play the game and achieve the best outcome for themselves. Through doing all these games, it was found that these behaviors and ideas have real life application.

Rules

Before we can build a model, we have to set the rules for the game. The rules allow for the game to exist within the realm of reality while also maintaining certain truths. For example, the goal of this game is for a player to achieve an outcome of winning their election. Placing second does no good in an electoral race, only first matters when there is one position up for grab. Therefore, the payoff of this game is either they win or they lose, there's no benefit from getting a good score such as in the prisoner dilemma game. This means that the consequence of a non-perfect payoff is 0 reward.

This causes the model that we build to focus on two outcomes, win or lose. The payoffs will just be a 1 and 0 for win and lose respectively. There can only be one winner, therefore it

must be assumed that every player in the competition is attempting to win and only for themselves. This is called rationality, this assumes that the players in the game are looking for the outcome that best suits them. Which in this case, would be winning the election.

Therefore, the best model to start off for this case would be a single dimensional model. This is due to the nature of this game, there's a single pay off and there won't be many players in this election. The election system will be based off of the American elections which means a single vote for each voter and first past the post voting where the goal is to reach the most votes of all the candidates. (While there are some states that requires a majority to win.) It also is assumed that the scenarios represent a general population unless specified otherwise. I will consider two single lined models in this project.

First Model

The model represesents a primary race with two candidates in the running for the position. To begin, this line indicates each candidate's political ideology on a 1-10 scale. 1 represents the most liberal politician while 10 represents the most conservative. The gaps between each number represent 11% of the population for that political leaning (the gap between 1-2 represents 11% of the most liberal leaning voters). The arching lines over the candidates represent the voters that politically are closest to that candidate and therefore would vote for them in this model.them in this model. As shown, Candidate B wins in a landslide with roughly 84% of the voters supporting them versus the only 16% of the vote that Candidate A got.

Model 1: Showcasing why moderate candidates are so prominent

This isnt due to one candidate being better than the other candidate by that much, it's rather that Candidate B appealed to much more of the voter base. As can seen, both are considered much more liberal candidates, but the voters from the far right of line are most aligned with Candidate B, even if politically they aren't similar at all. In a real life scenario they may not even vote with such liberal candidates being the only options, but if they do vote, they would vote for Candidate B.

This showcases a concept that is illustrated in our modern political parties, that it's best to be moderate as to get everyone under the "big tent". Big tent parties essentially refers to how the Republican and Democrat parties of today are the only main parties because they act as the most logical vote for everything to the extreme of them even though they are very moderate. Therefore, even though the Democrat party might be a 5 on the political scale, people a 1 politically would still vote for them because they are the closest candidate they can align to.

Second Model

The same model idea follows from the first model, however there will be three candidates instead of just two. You are candidate A, a candidate politically moderately left at 5 on the line. You are currently 2nd best odds to win the election race. However, as mentioned, the second best doesn't lead to any outcome in this area, so you need to obtain the best odds. Candidate B is the candidate with the best odds and they are moderately right political candidates listed at number 4. If you look at it, you are struggling vs candidate B because while you are both moderate, the candidate takes more moderate voters from you due to being positioned more towards the middle.

Therefore, you match up badly vs the candidate. It would be easier to face off against a candidate who is less moderate. This is where candidate C comes in, a very left leaning politician with the third best odds which allows for a realistic chance of winning who's 2 on the line. Candidate C is the best candidate for Candidate A to face off against as they are opposite sides politically meaning they won't steal voters from the right of you while not being able to entice moderate voters as much due to they themselves being on the extreme end politically. Also both Candidate B and Candidate C being in the same race is harmful to both of them. Because of how they are politically, they have the same voter base.
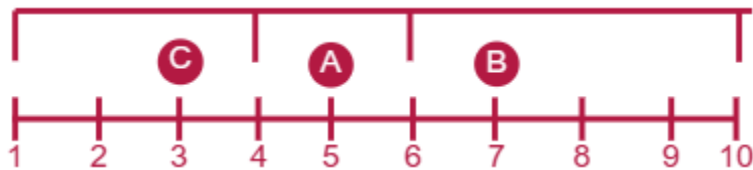
Model 2: Candidates with similar political ideologies stealing votes from each other

This line once again assumes that each space between numbers represents 11% of that area's population politically. Such as the space from 1-2 being 11% of the most liberal voters in the area. As shown above, Candidate C gets voters from the spaces of 1-3 or 33% of the voters while Candidate A is able to get them from 3-5.5 or 25% which, in total for the left candidates, is 55% of the voters. While that's a majority of voters, it's split between the two of them leading to both candidates hurting each other. It also leads to Candidate B getting 45% of the votes then from voters between 5.5 and 10 allowing for them to win the primary.

This game is one of the interesting ways of manipulating the others around you rather than improving your own campaign. In this scenario, Candidate A could have been replaced by

another candidate such as Candidate D and they still would have won assuming that Candidate A was also moderately conservative. This is due to the fact that they were the candidate best who was best positioned to the voters on the right. Candidate A did nothing besides benefit from infighting of voters on the left. If Candidate C was removed from the equation however, Candidate A would have easily lost with them only gaining the same 45% while Candidate B has 55%.. It's simply due to the quirk of the voting system which allows for a candidate to not need 50% of the vote and for it to be a single vote for a candidate.

<div align="center">Third Model</div>

This model is another version of manipulating others, but rather all of the candidates being in the same race, it involves focusing on a primary's results to get a better result in the national election. The rules for this game are that Candidate A and C are in a primary running against each other. Candidate B is also a candidate, but they are in a different primary. Candidate A is polling as the candidate most likely to win the national election, with B in second and C in third. B is afraid of running against Candidate A in the primary as they feel they will lose. Therefore, they are figuring out the best strategy of what to do with their campaign funds. They either can spend it on boosting their campaign or the alternative, put it into a PAC to support candidate C.

	Candidate A wins	Candidate C wins
Spend on own campaign	45,55	60,40
Spend on Candidate C	30,70	55,45

<div align="center">Model 3: Benefit of spending money on self vs opponent</div>

The payoffs above are meant to represent the percentage of voters supporting Candidate B and either Candidate A or C will get after the primaries. This model is meant to mimic the Prisoner dilemma, a very famous model meant to showcase the benefit of taking a selfish option. There isn't a Nash equilibrium in this game due to the fact that the first option influences the likelihood of the other option, therefore a true Nash Equilibrium can't occur. (though if it didn't influence, the option that would always be chosen would be the top left one by both candidates). Candidate A and and it's payoffs To understand why that second option is even an option, let's discuss the benefits and restrictions of spending money on one's own campaign. The obvious benefit is that it boosts advertising and gets your message out to more voters who will vote for you. Which is why it's necessary for all candidates to campaign. However, there's a point in which campaigning becomes stagnant and the needle of the amount of voters gained doesn't equal the cost spent into it. Especially for a national election when simply being your party's representative for the position gives enough of a boost to your campaign. Therefore, simply using money on a campaign isn't as useful as it seems.

That's where the benefit of spending money on another campaign comes in, essentially forcing model two to essentially occur again. While it would be best to spend money on your own campaign and for Candidate C to win, spending the money on Candidate C through a PAC makes that result more likely to happen and therefore is a better result. Especially because winning an election can be just by 51% or 100%, a win is a win. Same applies for a loss, as seen with spending on Candidate C and Candidate A winning, it's just the risk that will be taken to give Candidate B a chance of winning.

This model therefore showcases that in scenarios where Candidate B doesn't gain much from spending on their own campaign, it's better to spend money on the other party's primary.

This is also exemplified by the fact that it's much easier to beat a candidate in a primary than a national election. This is due to the fact that there's less money, voters and focus in a primary election, meaning that the financial spending makes a much bigger difference then in a national one.

Discussion on Models

The purpose of these models was to showcase a clear way and idea for how to spend money and manipulate an election, which was able to be found. Though there must be some caveats and clarifications to the models. The main thing being is that spending money on another person's campaign whether to make them win or steal votes from another candidate should only be done when the candidate spending the money is secure in their position. As mentioned in the third model, it's most effective when spending money on your own campaign won't move the needle. Therefore, if you are a candidate who either is dealing with others stealing votes from your base or doesn't even have a foothold of voters, it's most definitely best to spend money on your own campaign to make advertisements or fund public meetings. Especially because as shown in the House of Representative, candidates who spend the most money on their campaign win roughly 90% of the time. (Koerth)

Therefore, what would be the best strategy for someone who's not a frontrunner according to game theory? As shown with Model A, attempting to position yourself to appeal for a voter bloc or political side that doesn't have a clear candidate to steal their votes away from a candidate that doesn't appeal to them. While Game Theory would assume that all voters will vote, some voters will not vote if they feel neither candidate best fits their views at all. Therefore, getting votes from voters with no clear candidate is the best way to push a candidate into being a

contender. Though with everything, there are many more factors that are difficult to quantify at play such as the position being contested, the state or even minor things like the charisma of a candidate. Those factors would be analyzed deeper in any future research projects as this project is meant to be a general overview of elections rather than analyzing specific races.

Speaking of specific races, it was very difficult to find many explicit examples of funding other candidates in the news. This may be due to the stigma that a candidate wouldn't want to be seen as conniving or attempting to rig elections, therefore candidates would never purposefully reveal this strategy. The much more common example was candidates spending money to delegitimize a candidate or demonize them such as spending money on ads that discredit their accomplishments or ideas. Smear campaigns have been a thing since politics have begun and while very interesting, they are a known quantity to take into account.There was however one prominent example found that illustrated a party attempting this very idea of spending money to boost another campaign.

Jeff Jackson is a House of Representative member from the state of North Carolina who has been in the HoR for the past two years. They have a Tik Tok (@JeffjacksonNC) with over two million followers and use their platform to explain congress and what goes on in their life. This year, they are attempting to run for the North Carolina Attorney General position as a Democrat. On February 23rd, they posted a video with the caption "A mass deception operation". In the video, Jackson discussed his primary race against his opponent, Santana Deberry and how something interesting happened. The Republican Primary had already had its candidate chosen, which led to the theoretical scenario of Model 3 to occur.

A PAC named "And Justice for All" was formed and proceeded to spend a million dollars on Deberry. Jackson says that it wasn't made by his opponent, but instead by the Republican

party. He said that they felt Jackson was too much of a threat in the race, therefore they attempted to make him lose in the primary so that the Democratic candidate would be easier to beat. While this can be argued as a biased source, the PAC does exist and it does seem like that what they did is as Jackson described. What was even more interesting is that Jackson ended up winning the primary anyways, so their intended goal wasn't even achieved. Overall very interesting to see these tactics being attempted, will also be interesting to see if any cases of it will be attempted and succeeded in the future.

Consequences

One thing mentioned by Jackson is that this is a very dirty tactic to try and fund another campaign. While this experiment has been all theoretical, the fact that this tactic can work and has been attempted brings into question the legality and morality of it. Legally, as long as it's done through a PAC, the candidate attempting this strategy is not at any fault. Morally however, it can be seen as dirty. Smear campaigns as mentioned previously, while a common action, also tend to be looked down upon because it's less proving why you are a good candidate and attempting to make the other candidate look so non-appealing that you are the only reasonable candidate. The strategies mentioned here can be seen as very much that, less promoting one's own candidacy and more so pushing down other candidates you see as threats. Which while I argue is true, it's simply an unfortunate flaw of the United State's voting system and there are some differences.

America's current voting system is a first past the post with a single vote. What this means is that the candidate with either 50% + 1 of the vote or more than every other candidate in the case of primaries wins the race. This is a very big flaw as it ends up reducing the amount of candidates who end up running. This is due to a human factor that's not mentioned in the paper,

that voters want to choose who they think will win, not who best fits themselves. In any case where it's first past the post, it will end up being only two candidates as voters don't want to risk voting for non-serious candidates. This is why the two "big tent" parties of Democrats and Republicans exist; all other parties were seen as not contenders for the presidency, so ceased to exist as an option for voters. This leads to a lot of stagnancy and inaction as parties will attempt to appeal to the broadest amount of voters rather than focus on specific issues.

This means that any candidate who does well as a third candidate ends up being a vote stealer for one of the parties. This can be seen most prominently in the election of 1912, where Democrat Woodrow Wilson won as Theodore Roosevelt, a third party candidate for the Progressive Party at the time and Presidential incumbent William Taft ended up stealing votes from each other as Republican voters favored them. It's even more crazy when you consider that Wilson only got 41% of the popular vote (Britannica) though that's more an issue with the electoral college, a topic which also deserves an entire capstone project dedicated to it.

What this is leading to is that while this can be considered a dirty tactic, it's just a consequence of how the American electoral system is and these tactics popping up would hopefully cause a change in how voting is done to a system such as ranked choice voting where candidates choose which candidates they would vote for ranked from 1-#. The tallies are then taken with the bottom candidate in vote getting removed and anyone who voted for that candidate #1 gets their vote added to their second choice candidate. This process goes on until there's a candidate with 50% of the vote. A voting system like this would make the whole idea of this paper null. There is also an argument that this tactic isn't as dirty as a smear campaign since it does require a candidate to be doing good in the first place. As mentioned, these tactics and

allocation of funds only work if the candidate doing so is a candidate that voters would vote for naturally.

Conclusion

There is one last thing to discuss, should we expect these ideas to pop in the upcoming election? Which I say, while they may not have a major effect, the ideas posed in this paper will be very present. While the primaries have passed with not much in terms of reference to Model 2 or Model 3 outside of the Jeff Jackson scenario, there is one election to keep a lookout for which is the presidential race. This is due to an interesting revelation of a prominent third party candidate running alongside Joe Biden and Donald Trump, the independent candidate of Robert F Kennedy JR. It will be very interesting to see where Kennedy aligns as he is unlike other third parties of the past such as the Green Party or Libertarian where they line on the extreme ends of the political spectrum. Both Democrats and Republicans feel as though Kennedy may steal votes from them as he is truly a moderate/independent, which leads to maybe his factor being miniscule. Though at least from my own predictions, I imagine we may see this effect on the Republican party more than the Democrat due to Kennedy's views on key topics such as abortion even with the name brand of Kennedy.

To close, when I first started brainstorming ideas for my project and started research on this topic, I was at first figuring out if this is even legal to do. I was concerned that this idea would have too little to be able to make a full fledged project around as there weren't any real examples of this idea in actual elections and a whole project just on game theory seemed to be a bit much. Now, I can confidently say that this project was the right choice, that the ideas applied here are legitimate and can very easily be used in the real world. If the time permits, I hope I am

able to further research on this project as more real life examples occur, my knowledge on game theory expands or when the time presents itself as my academic journey continues. I believe that game theory is a very untapped topic within the politics community and I believe that using these models help explain a lot of behaviors we currently see in voting. If there is one thing I would like to improve or change on for this project, I think I would have liked to investigate more of the exact economic breakdown of putting campaign funds into a PAC and sending it to support another candidate. The Deberry/Jackson situation was so interesting since I would have never imagined it being that high of an amount spent on a primary in a state position. As is currently shown in the project, there was only really an option of either spending the money on yourself or another campaign, I wasn't able to really figure out a fine balance of showcasing splitting funds to do both. Hopefully, that's an aspect that I flesh out in the future.

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