

Voting

People on whom I do not bother to vote
Are people who do not bother to vote

—Ogden Nash,
“Election Day Is a Holiday”

THE FOUNDATION OF a democratic government is that it respects the will of the people as expressed through the ballot box. Unfortunately, these lofty ideals are not so easily implemented. Strategic issues arise in voting, just as in any other multiperson game. Voters will often have an incentive to misrepresent their true preferences. Neither majority rule nor any other voting scheme can solve this problem, for there does not exist any one perfect system for aggregating individuals' preferences into a will of the people.¹

Actually, simple majority rule works fine in a two-candidate race. If you prefer A over B, then vote for A. There's no need to strategize.* The problems start to arise when there are three or more candidates on the ballot. The voter's problem is whether to vote honestly for the most preferred candidate or to vote strategically for a second or third choice who is a viable candidate.

We saw this issue clearly in the presidential election of 2000. The presence

of Ralph Nader on the ballot swung the election from Al Gore to George W. Bush. Here we don't mean that the hanging chads or the butterfly ballot turned the election. We mean that if Ralph Nader hadn't run, Al Gore would have won Florida and the election.

Recall that Nader had 97,488 votes in Florida and Bush won with 537 votes. It doesn't take much imagination to see that a large majority of Nader voters would have chosen Gore over Bush.

Nader argues that there were many causes of Gore's defeat. He reminds us that Gore lost his home state of Tennessee, that thousands of Florida voters had been misidentified as ex-felons and removed from the state's rolls, and that 12 percent of Florida's Democrats voted for Bush (or mistakenly for Buchanan). Yes, there were many explanations for Gore's loss. But one of them was Nader.

Our point here is not to bash Nader or any other third-party candidate. Our point is to bash the way we vote. We would like people who genuinely want Ralph Nader to be president to have a way to express that view without having to give up their vote in Bush vs. Gore.*

The challenges of voting in a three-way race hasn't just helped Republicans. Bill Clinton's election in 1992 was much more lopsided as a result of Ross Perot getting 19 percent of the vote. Clinton had 370 electoral votes to George H. W. Bush's 168. It is easy to imagine that several red states (Colorado, Georgia, Kentucky, New Hampshire, Montana) could have gone the other way absent Perot.² Unlike in 2000, Clinton would still have won, but the electoral vote could have been much closer.

In the first round of the 2002 French presidential election, the three leading candidates were the incumbent, Jacques Chirac, socialist Lionel Jospin, and the extreme rightist Jean-Marie Le Pen. There were also several candidates of fringe leftwing parties—Maoists, Trotskyites, and the like. It was widely expected that Chirac and Jospin would emerge as the top two vote-getters in the first round and face each other in the runoff election. Therefore many left-wingers indulged themselves by naïvely voting for their most preferred fringe candidates in the first round. They were then stunned when Prime Minister Jospin received fewer votes than Le Pen. In the second round they had to do something unthinkable—vote for the right-winger Chirac, whom they hated, so as to keep out the extremist Le Pen, whom they despised even more.

These cases illustrate where strategy and ethics may collide. Think about when your vote matters. If the election will be won by Bush (or Gore) or Chirac (or Jospin) whether you vote or not, then you might as well vote with your heart. That is because your vote doesn't matter. Your vote really counts when it breaks a tie (or causes a tie). This is what is called being a *pivotal* voter.

If you vote assuming that your vote will count, then a vote for Nader (or a fringe leftist party in France) is a missed opportunity. Even Nader supporters should vote as if they are the one to break the tie between Bush and Gore. This is a bit paradoxical. To the extent that your vote doesn't matter, you can afford to vote with your heart. But, when your vote does matter, then you should be strategic. That's the paradox: it is only okay to speak the truth when it doesn't matter.

You might think that the chance that your vote will ever matter is so small that it can be ignored. In the case of a presidential election, that is pretty much true in a solid blue state like Rhode Island or a solid red state like Texas. But in more balanced states such as New Mexico, Ohio, and Florida, the election result can be close indeed. And while the chance of breaking a tie is still quite small, the effect of such a change is quite large.

The strategic vote problem is an even greater problem for primaries, because there are often four or more candidates. The problem arises both when it comes to voting and when it comes to fundraising. Supporters don't want to waste their vote or campaign contributions on a nonviable candidate. Thus polls and media characterizations that pronounce front-runners have the potential to become self-fulfilling prophecies. The reverse problem can also arise: people expect that someone is a shoe-in and then feel free to vote with their heart for a fringe candidate, only to discover that their second-choice and viable candidate (for example, Jospin) was eliminated.

We are not advocates of strategic voting but the messengers of bad news. We would like nothing more than to propose a voting system that encouraged people to play it straight. Ideally, the voting system could aggregate preferences in a way that expressed the will of the people without leading people to be strategic. Unfortunately, Kenneth Arrow showed that there is no such holy grail. Any way of adding up votes is bound to be flawed.³ What that means in practical terms is that people will always have an incentive to vote strategically. Thus the election result will be determined by the process just as much as by the voter preferences. That said, you might judge some voting systems to be more flawed than others. We look at some different ways to decide elections below, highlighting the problems and the advantages of each.

NAÏVE VOTING

The most commonly used election procedure is simple majority voting. And yet the results of the majority-rule system can have paradoxical properties, even

more peculiar than those demonstrated in the 2000 election. This possibility was first recognized over two hundred years ago by the French Revolution hero Marquis de Condorcet. In his honor, we illustrate his fundamental paradox of majority rule using revolutionary France as the setting.

After the fall of the Bastille, who would be the new populist leader of France? Suppose three candidates, Mr. Robespierre (R), Mr. Danton (D), and Madame Lafarge (L), are competing for the position. The population is divided into three groups, left, middle, and right, with the following preferences:

Left	Middle	Right
40	25	35
R	D	L
D	L	R
L	R	D

There are 40 voters on the left, 25 in the middle, and 35 on the right. In a vote of Robespierre against Danton, Robespierre wins, 75 to 25. Then in a vote of Robespierre against Lafarge, Lafarge beats Robespierre, 60 to 40. But in a vote of Lafarge against Danton, Danton wins, 65 to 35. There is no overall winner. No one candidate can beat all the others in a head-to-head election. If any candidate were elected, there is another whom a majority would prefer.

This possibility of endless cycles makes it impossible to specify any of the alternatives as representing the will of the people. When Condorcet was faced with this very issue, he proposed that elections that were decided by a larger majority should take precedence over ones that were closer. His reasoning was that there was some true will of the people and that the cycle must therefore reflect a mistake. It was more likely that the small majority was mistaken than the large one.

Based on this logic, the 75 to 25 victory of Robespierre against Danton and 65 to 35 victory of Danton over Lafarge should take priority over the smallest majority, the 60 to 40 victory of Lafarge over Robespierre. In Condorcet's view, Robespierre is clearly preferred over Danton, and Danton is preferred over Lafarge. Thus Robespierre is the best candidate, and the slim majority that favors Lafarge over Robespierre is a mistake. Another way of putting this is that Robespierre should be declared the victor because the maximum vote against Robespierre was 60, while all the other candidates were beaten by an even larger margin.

The irony here is that the French use a different system today, what is often

called runoff voting. In their elections, assuming no one gets an absolute majority, the two candidates with the greatest number of votes are selected to go against each other in a runoff election.

Consider what would happen if we used the French system with the three candidates in our example. In the first round, Robespierre would come in first, with 40 votes (as he is the first choice of all 40 voters on the left). Lafarge would come in second, with 35 votes. Danton would come in last, with only 25 votes.

Based on these results, Danton would be eliminated, and the two top vote getters, Robespierre and Lafarge, would meet in a runoff election. In that runoff, we can predict that the Danton supporters would throw their support to Lafarge, who would then win, 60 to 40. Here is more evidence, if it is needed, that the outcome of the election is determined by the rules of voting just as much as by the preferences of the voters.

Of course, we have assumed that the voters are naïve in their decisions. If polls were able to accurately predict voter preferences, then the Robespierre supporters could anticipate that their candidate would lose in a runoff election against Lafarge. That would leave them with their worst possible outcome. As a result, they would have an incentive to vote strategically for Danton, who could then win outright in the first ballot, with 65 percent of the vote.

CONDORCET RULES

Condorcet's insight can offer a solution to the problem of voting in primaries or even the general election when there are three or more candidates. What Condorcet proposes is to have each pair of candidates compete in a pairwise vote. Thus in 2000, there would have been a vote of Bush vs. Gore, Bush vs. Nader, and Gore vs. Nader. The electoral victor would be the candidate who has the smallest maximum vote against him.

Imagine that Gore would have beat Bush, 51–49; Gore would have beat Nader, 80–20; and that Bush would have beat Nader, 70–30. In that case, the maximum vote against Gore was 49, and this is smaller than the maximum against either Bush (51) or Nader (80). Indeed, Gore is what is called a Condorcet winner in that he beats all of the other candidates in head-to-head contests.*

One might think this is interesting in theory but wildly impractical. How could we ask people to vote in three separate elections? And in a primary with six candidates, people would have to vote 15 different times to express their opinions about all two-way races. That seems truly impossible.

Fortunately, there is a simple approach that makes all of this quite practical. All voters have to do is rank their candidates on the ballot. Given that ranking, the computer knows how to vote for any matchup. Thus a voter who ranks the candidates in the order

Gore
Nader
Bush

would vote for Gore over Nader, Nader over Bush, and Gore over Bush. A voter who provides a ranking for the six candidates in a primary has implicitly given a ranking for all possible 15 pairwise choices. If the contest is between her #2 and #5 choices, the vote goes to #2. (If the ranking is incomplete, that's okay, too. A ranked candidate beats all unranked candidates, and the person abstains when the choice is between two unranked ones.)

At Yale School of Management, we implemented the Condorcet voting system to hand out the annual teaching prize. Prior to this, the winner was determined by plurality rule. With some 50 faculty and hence 50 eligible candidates, it was theoretically possible to win the prize with just over 2 percent of the vote (if the votes were nearly evenly split between all of the candidates). More realistically, there were always a half-dozen strong contenders and another half-dozen with some support. Twenty-five percent was typically enough to win, and so the winner was determined by which candidate's support team managed to focus their vote. Now the students simply rank their professors in order and the computer does all of the voting for them. The winners seem more in line with student demand.

Is it worth the effort to change the way we vote? The next section shows how controlling the agenda can determine the outcome. With the presence of a voting cycle, the outcome is highly sensitive to the voting procedure.

ORDER IN THE COURT

The way the U.S. judicial system works, a defendant is first found to be innocent or guilty. The punishment sentence is determined only after a defendant has been found guilty. It might seem that this is a relatively minor procedural issue. Yet the order of this decision making can mean the difference between life and death, or even between conviction and acquittal. We use the case of a

defendant charged with a capital offense to make our point.

There are three alternative procedures to determine the outcome of a criminal court case. Each has its merits, and you might want to choose from among them based on some underlying principles.

1. Status Quo: First determine innocence or guilt; then, if guilty, consider the appropriate punishment.
2. Roman Tradition: After hearing the evidence, start with the most serious punishment and work down the list. First decide if the death penalty should be imposed for this case. If not, decide whether a life sentence is justified. If, after proceeding down the list, no sentence is imposed, the defendant is acquitted.
3. Mandatory Sentencing: First specify the sentence for the crime. Then determine whether the defendant should be convicted.

The only difference between these systems is one of agenda: what gets decided first. To illustrate how important this can be, we consider a case with only three possible outcomes: the death penalty, life imprisonment, and acquittal.⁴ This story is based on a true case; it is a modern update of the dilemma faced by Pliny the Younger, a Roman senator under Emperor Trajan around A.D. 100.⁵

The defendant's fate rests in the hands of three deeply divided judges. Their decision is determined by a majority vote. One judge (Judge A) holds that the defendant is guilty and should be given the maximum possible sentence. This judge seeks to impose the death penalty. Life imprisonment is his second choice and acquittal is his worst outcome.

The second judge (Judge B) also believes that the defendant is guilty. However, this judge adamantly opposes the death penalty. His preferred outcome is life imprisonment. The precedent of imposing a death sentence is sufficiently troublesome that he would prefer to see the defendant acquitted rather than executed by the state.

The third judge, Judge C, is alone in holding that the defendant is innocent and thus seeks acquittal. He is on the other side of the fence from the second judge, believing that life in prison is a fate worse than death. (On this the defendant concurs.) Consequently, if acquittal fails, his second best outcome would be to see the defendant sentenced to death. Life in prison would be the

worst outcome.

	Judge A's ranking	Judge B's ranking	Judge C's ranking
Best	Death sentence	Life in prison	Acquittal
Middle	Life in prison	Acquittal	Death sentence
Worst	Acquittal	Death sentence	Life in prison

Under the status quo system, the first vote is to determine innocence versus guilt. But these judges are sophisticated decision makers. They look ahead and reason backward. They correctly predict that, if the defendant is found guilty, the vote will be two to one in favor of the death penalty. This effectively means that the original vote is between acquittal and the death penalty. Acquittal wins two to one, as Judge B tips the vote.

It didn't have to turn out that way. The judges might decide to follow the Roman tradition and work their way down the list of charges, starting with the most serious ones. They first decide whether or not to impose the death penalty. If the death penalty is chosen, there are no more decisions to be made. If the death penalty is rejected, the remaining options are life imprisonment and acquittal. By looking forward, the judges recognize that life imprisonment will be the outcome of the second stage. Reasoning backward, the first question reduces to a choice between life in prison and a death sentence. The death sentence wins two to one, with only Judge B dissenting.

A third reasonable alternative is to first determine the appropriate punishment for the crime at hand. Here we are thinking along the lines of a mandatory sentencing code. Once the sentence has been determined, the judges must then decide whether the defendant in the case at hand is guilty of the crime. In this case, if the predetermined sentence is life imprisonment, then the defendant will be found guilty, as Judges A and B vote for conviction. But if the death penalty is to be required, then we see that the defendant will be acquitted, as Judges B and C are unwilling to convict. Thus the choice of sentencing penalty comes down to the choice of life imprisonment versus acquittal. The vote is for life imprisonment, with Judge C casting the lone dissenting vote.

You may find it remarkable and perhaps troubling that any of the three outcomes is possible based solely on the order in which votes are taken. Your choice of judicial system might then depend on the outcome rather than the underlying principles. What this means is that the structure of the game matters. For example, when Congress has to choose between many competing bills, the order in which votes are taken can have a great influence on the final outcome.

THE MEDIAN VOTER

In thinking about voting, we've assumed so far that the candidates simply emerge with a position. The way in which candidates choose their positions is equally strategic. Thus we now turn our attention to the question of how voters try to influence the position of candidates and where the candidates will end up.

One way to help keep your vote from getting lost in the crowd is to make it stand out: take an extreme position away from the crowd. Someone who thinks that the country is too liberal could vote for a moderately conservative candidate. Or she could go all the way to the extreme right and support Rush Limbaugh (should he run). To the extent that candidates compromise by taking central positions, it may be in some voters' interests to appear more extreme than they are. This tactic is effective only up to a point. If you go overboard, you are thought of as a crackpot, and the result is that your opinion is ignored. The trick is to take the most extreme stand consistent with appearing rational.

To make this a little more precise, imagine that we can align all the candidates on a 0 to 100 scale of liberal to conservative. The Green Party is way on the left, around 0, while Rush Limbaugh takes the most conservative stance, somewhere near 100. Voters express their preference by picking some point along the spectrum. Suppose the winner of the election is the candidate whose position is the average of all voters' positions. The way you might think of this happening is that, through negotiations and compromises, the leading candidate's position is chosen to reflect the average position of the electorate. The parallel in bargaining is to settle disputes by offering to "split the difference."

Consider yourself a middle-of-the-roader: if it were in your hands, you would prefer a candidate who stands at the position 50 on our scale. But it may turn out that the country is a bit more conservative than that. Without you, the average is 60. For concreteness, you are one of a hundred voters polled to determine the average position. If you state your actual preference, the candidate will move to $(99 \times 60 + 50)/100 = 59.9$. If, instead, you exaggerate and claim to want 0, the final outcome will be at 59.4. By exaggerating your claim, you are six times as effective in influencing the candidate's position. Here, extremism in the defense of liberalism is no vice.

Of course, you won't be the only one doing this. All those more liberal than 60 will be claiming to be at 0, while those more conservative will be arguing for 100. In the end, everyone will appear to be polarized, although the candidate will still take some central position. The extent of the compromise will depend on the

relative numbers pushing in each direction.

The problem with this averaging approach is that it tries to take into account both intensity and direction of preferences. People have an incentive to tell the truth about direction but exaggerate when it comes to intensity. The same problem arises with “split the difference”: if that is the rule for settling disputes, everyone will begin with an extreme position.

One solution to this problem is related to Harold Hotelling’s observation (discussed in chapter 9) that political parties will converge to the median voter’s position. No voter will take an extreme position if the candidate follows the preferences of the median voter—that is, he chooses the platform where there are exactly as many voters who want the candidate to move left as to move right. Unlike the mean, the median position does not depend on the intensity of the voters’ preferences, only their preferred direction. To find the median point, a candidate could start at 0 and keep moving to the right as long as a majority supports this change. At the median, the support for any further rightward move is exactly balanced by the equal number of voters who prefer a shift left.

When a candidate adopts the median position, no voter has an incentive to distort her preferences. Why? There are only three cases to consider: (i) a voter to the left of the median, (ii) a voter exactly at the median, and (iii) a voter to the right of the median. In the first case, exaggerating preferences leftward does not alter the median, and therefore the position adopted, at all. The only way that this voter can change the outcome is to support a move rightward. But this is exactly counter to his interest. In the second case, the voter’s ideal position is being adopted anyway, and there is nothing to gain by a distortion of preferences. The third case parallels the first. Moving more to the right has no effect on the median, while voting for a move left is counter to the voter’s interests.

The way the argument was phrased suggested that the voter knows the median point for the voting population and whether she is to the right or the left of it. Yet the incentive to tell the truth had nothing to do with which of those outcomes occurred. You can think about all three of the above cases as possibilities and then realize that whichever outcome materializes, the voter will want to reveal her position honestly. The advantage of the rule that adopts the median position is that no voter has an incentive to distort her preferences; truthful voting is the dominant strategy for everyone.

The only problem with adopting the median voter’s position is its limited applicability. This option is available only when everything can be reduced to a one-dimensional choice, as in liberal versus conservative. But not all issues are so easily classified. Once voters’ preferences are more than one-dimensional,

there will not be a median, and this neat solution no longer works.

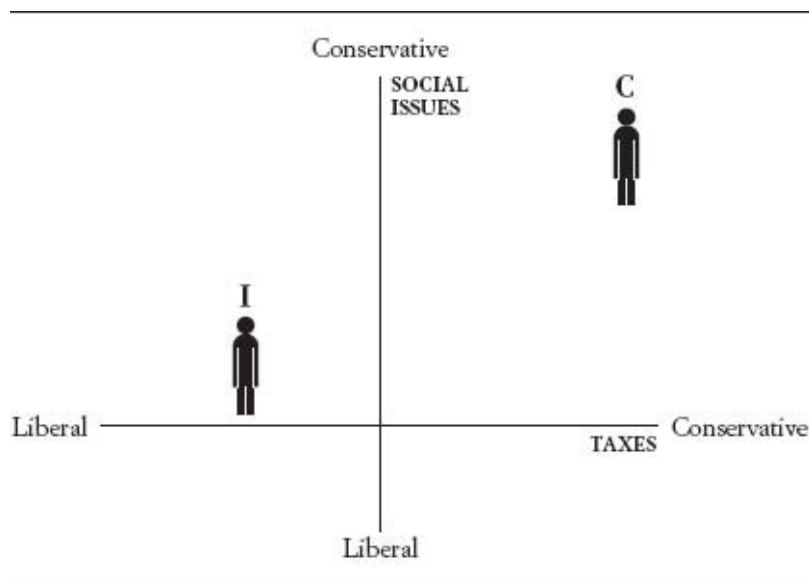
WHY THE CONSTITUTION WORKS

Warning: The material in this section is hard, even for a trip to the gym. We include it because it provides an example of how game theory helps us understand why the U.S. Constitution has proved so durable. The fact that the result is based on research from one of your authors might also play some small part.

We said that things got much more complicated when the candidate positions can no longer be ordered along a single dimension. We turn now to the case where the electorate cares about two issues—say, taxes and social issues.

When everything was one-dimensional, the candidate's position could be represented by a score from 0 to 100, which you can think of as a position on a line. Now the candidate's position on these two issues can be represented as a point in a plane. If there are three issues that matter, then the candidates would have to be located in a three-dimensional space, which is much harder to draw in a two-dimensional book.

We represent a candidate's position on each of the two issues by where he or she is located.

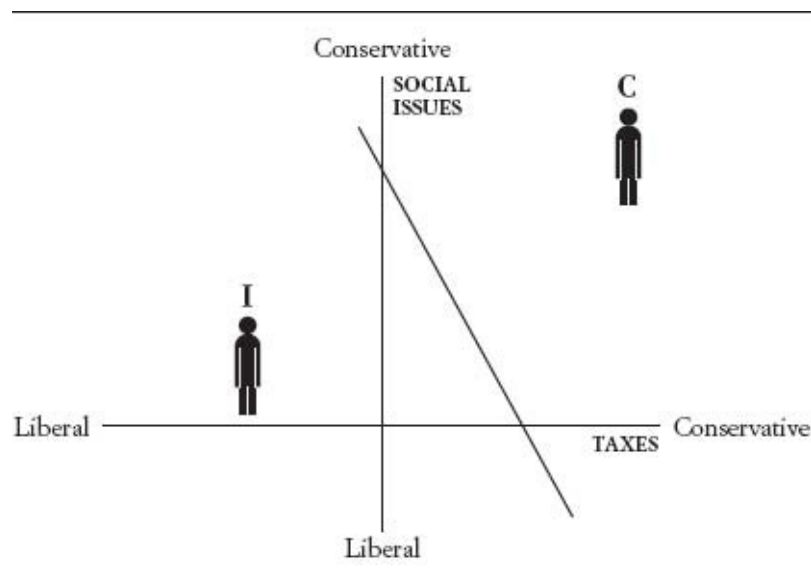


As drawn, the incumbent (I) is middle-of-the-road, slightly liberal on taxes and slightly conservative on social issues. In contrast, the challenger (C) has taken a very conservative position on both taxes and social issues.

Each voter can be thought of as being located at a point in space. The location is the voter's most preferred position. Voters have a simple rule: they vote for the candidate who is closest to their preferred position.

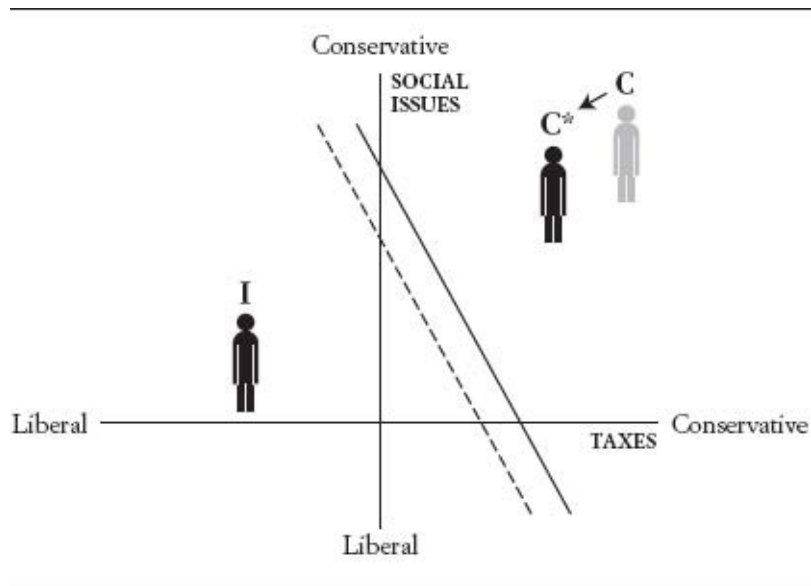
Our next diagram illustrates how the votes will be divided between the two candidates. All those to the left will vote for the incumbent and those to the right will vote for the challenger.

Now that we've explained the rules of the game, where do you imagine the challenger will want to locate? And, if the incumbent is smart enough to best position herself to fend off the challenger, where will she start out?



Note that as the challenger moves closer to the incumbent, he picks up some votes but loses none. (For example, the move from C to C* expands the group of voters who prefer C; the dividing line is now the dashed line.) That is because anyone who prefers the challenger's position to the incumbent's also prefers something halfway between the two to the incumbent's. Likewise a person who prefers a \$1.00 gas tax to no tax is also likely to prefer a 50¢ tax to no tax. What this means is that the challenger has the incentive to locate right next to the incumbent, coming at the incumbent from a direction where there are the most voters. In the picture, the challenger would come at the incumbent directly from the northeast.

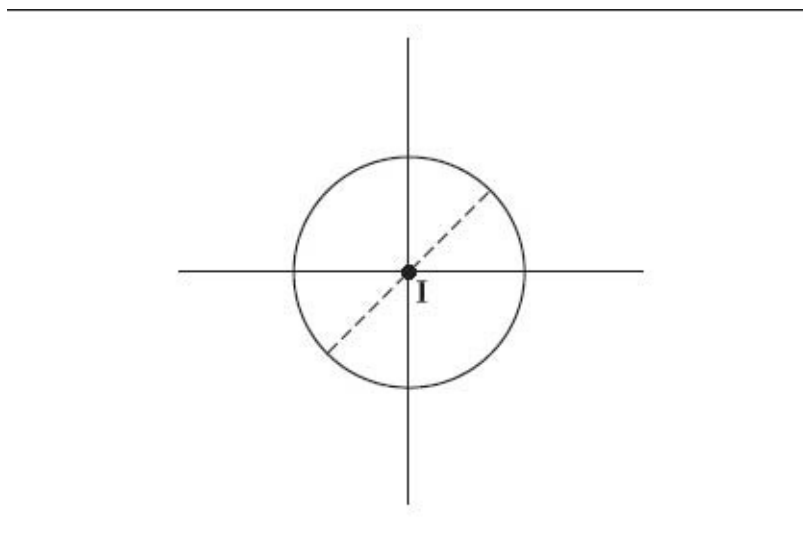
The challenge for the incumbent is much like the famous cake-cutting problem. In the cake-cutting problem, there are two kids who have to share a cake. The question is to develop a procedure for them to divide it up so as to ensure that each feels he has gotten (at least) half of the cake.



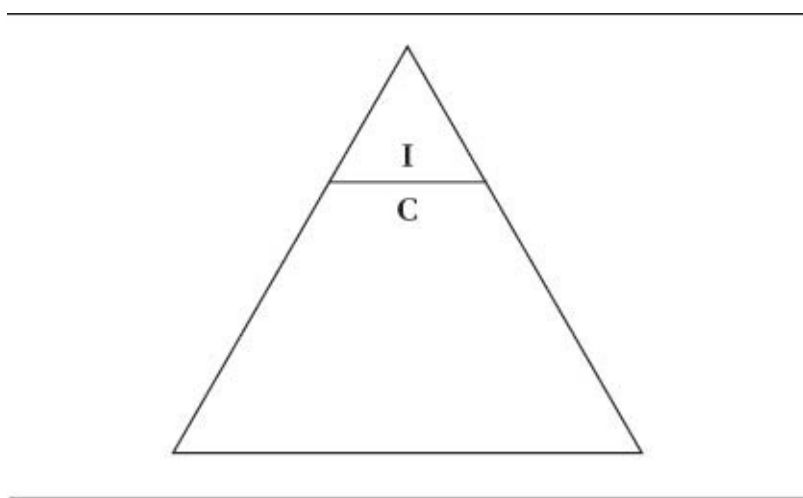
The solution is “I cut, you choose.” One kid cuts the cake while the other chooses. This gives the first child an incentive to cut the cake as evenly as possible. Since the second kid has a choice of halves, he will not feel cheated.

This problem is a bit different. Here the challenger gets to cut the cake and to choose. But the incumbent gets to stake out a position that the challenger has to cut through. For example, if all of the voters are uniformly located in a disk, then the incumbent can position herself right in the center. However the challenger tries to position himself in relation to the incumbent, the incumbent can still attract half the voters. In the figure that follows, the dashed line represents a challenger coming from the northwest. The disk is still split in two. The center of the disk is always closest to at least half the points in the disk.

The situation is more complicated if voters are uniformly located in a triangle. (For simplicity, we leave off the issue axes.) Now where should the incumbent position herself, and what is the greatest number of votes that she can assure herself of?



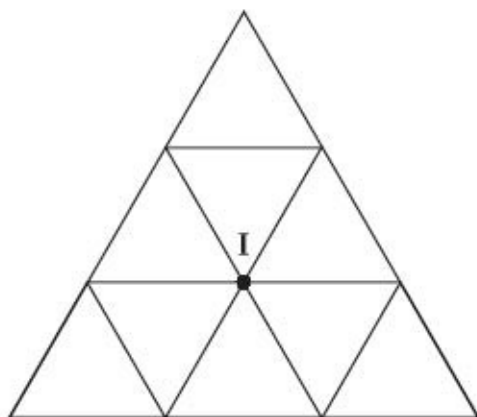
In the picture below, the incumbent has positioned herself poorly. If the challenger were to approach from either the left or the right, the incumbent can still attract support from half the voters. But were the challenger to approach from below, she can garner well more than half the votes. The incumbent would have done better to have positioned herself lower down to preempt this attack.



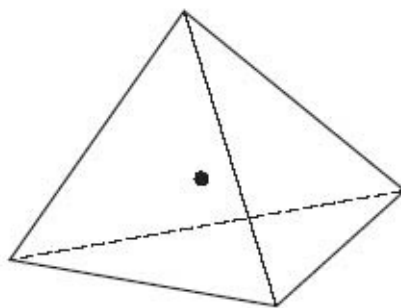
It turns out that locating at the average point in the set, what is known as the center of gravity, will guarantee the incumbent at least $4/9$ of the total vote. The incumbent will attract $2/3$ of the vote in each of two dimensions for a total of $(2/3) \times (2/3) = 4/9$.

You can see in the figure below that we've divided the triangle up into nine smaller triangles, each a mini-me of the large one. The center of gravity of the triangle is where the three lines intersect. (It is also the preferred position of the

average voter.) By locating at the center of gravity, the incumbent can guarantee herself support from voters in at least four of the nine triangles. For example, the challenger can attack from straight below and capture all of the voters in the bottom five triangles.



If we extend this to a triangle in three dimensions, then the incumbent still does best by locating at the center of gravity but now can be guaranteed only $(3/4) \times (3/4) \times (3/4) = 27/64$ of the vote.



A rather surprising finding is that the triangle (and its multidimensional analogs) turns out to be the worst possible result for the incumbent across all convex sets in any number of dimensions. (A set is convex if for any two points in the set, the line connecting them is also in the set. Thus a disk and a triangle are convex, while the letter T is not.)

Now for the real surprise. Across all convex sets, the incumbent, by locating at the center of gravity, can guarantee herself at least $1/e = 1/2.71828 \approx 36$ percent of the vote. The result even holds when voters are normally distributed

(like a bell curve) rather than uniform. What that means is that if a 64 percent majority is required to dislodge the status quo, then it is possible to find a stable outcome by picking the point that is the average of all the voters' preferences. No matter the challenger's position, the incumbent is able to attract at least 36 percent of the vote and thus remain in place.⁶ All that is required is that the distribution of voter preferences isn't too extreme. It is okay for some people to take extreme positions so long as there are relatively more people in the middle, as arises with the normal distribution.

The incumbent could be a policy or a precedent, not just a politician. This might then explain the stability of the U.S. Constitution. If all it took was a simple majority (50 percent) to amend the Constitution, it could spin around in cycles. But as it requires more than a 64 percent majority, namely a two-thirds vote, then there is some position that is undefeatable against all comers. That doesn't mean any status quo would be undefeated by all other alternatives. It means that there is some status quo, namely the average position in the voter population, which can't be beaten according to a 67–33 vote.

We want a majority rule that is small enough to allow for flexibility or change when preferences change but not so small as to create instability. A simple majority rule is the most flexible, but is too flexible. It has the potential for cycles and instability. At the other extreme, a 100 percent or unanimity rule would eliminate cycles but lock in the status quo. The goal is to pick the smallest majority size that ensures a stable outcome. It looks like two-thirds majority rule is just on the right side of 64 percent to do the trick. The U.S. Constitution got it right.

We appreciate that this all went a bit quickly. The results here are based on the research of Andrew Caplin done jointly with Barry Nalebuff.⁷

ALL-TIME GREATS

Back to Earth. After the White House, election to Cooperstown may be the next most coveted national honor. Membership in the Baseball Hall of Fame is determined by an election. There is a group of eligible candidates—a player with ten years of experience becomes eligible five years after retirement.* The electors are the members of the Baseball Writers' Association. Each voter may vote for up to ten candidates. All candidates capturing votes from more than 75 percent of the total number of ballots returned are elected.

As you would now expect, a problem with this system is that the electors don't have the right incentives to vote for their true preferences. The rule that

limits each voter to ten choices forces the voters to consider electability as well as merit. (You might think that ten votes are enough, but remember there are around thirty candidates on the ballot.) Some sportswriters may believe a candidate is deserving, but they don't want to throw away the vote if the player is unlikely to make the cutoff. This same issue arose for voting in presidential primaries, and it appears in any election in which each voter is given a fixed number of votes to distribute among the candidates.

Two experts in game theory propose an alternative way to run elections. Steven Brams and Peter Fishburn, one a political scientist and the other an economist, argue that "approval voting" allows voters to express their true preferences without concern for electability.⁸ Under approval voting, each voter may vote for as many candidates as he wishes. Voting for one person does not exclude voting for any number of others. Thus there is no harm in voting for a candidate who has no hope of winning. Of course if people can vote for as many candidates as they wish, who gets elected? Like the Cooperstown rule, the electoral rule could specify in advance a percentage of the vote needed to win. Or it could prespecify the number of winning candidates, and then the positions are filled by those who gather the greatest number of votes.

Approval voting has begun to catch on and is used by many professional societies. How would it work for the Baseball Hall of Fame? Would Congress do better if it used approval voting when deciding which expenditure projects should be included in the annual budget? We look at the strategic issues associated with approval voting when a cutoff percentage determines the winners.

Imagine that election to the different sports halls of fame was decided by approval voting, in which all candidates capturing above a fixed percentage of the votes are elected. At first glance, the voters have no incentive to misstate their preferences. The candidates are not in competition with one another but only with an absolute standard of quality implicit in the rule that specifies the required percentage of approval. If I think Mark McGwire should be in the Baseball Hall of Fame, I can only reduce his chances by withholding my approval, and if I think he doesn't belong there, I can only make his admission more likely by voting contrary to my view.

However, candidates may compete against one another in the voters' minds, even though nothing in the rules mandates it. This will usually happen because voters have preferences concerning the size or the structure of the membership. Suppose Mark McGwire and Sammy Sosa come up for election to the Baseball Hall of Fame.* I think McGwire is the better hitter, although I will admit that Sosa also meets the standard for a Hall of Fame berth. However, I think it most

important that two sluggers not be elected in the same year. My guess is that the rest of the electorate regards Sosa more highly and he would get in no matter how I vote but that McGwire's case will be a close call, and my approval is likely to tip him over. Voting truthfully means naming McGwire, which is likely to lead to the outcome in which both are admitted. Therefore I have the incentive to misstate my preference and vote for Sosa.

If this seems a bit convoluted, it is. That's the type of reasoning that would be required for people to act strategically under approval voting. It is possible, though unlikely. A similar problem arises if two players complement each other, rather than compete with each other, in the voters' minds.

I may think neither Geoff Boycott nor Sunil Gavaskar belongs in the Cricket Hall of Fame, but it would be a gross injustice to have one and not the other. If in my judgment the rest of the electorate would choose Boycott even if I don't vote for him, while my vote may be crucial in deciding Gavaskar's selection, then I have an incentive to misstate my preference and vote for Gavaskar.

In contrast, a quota rule explicitly places candidates in competition with one another. Suppose the Baseball Hall of Fame limits admission to only two new people each year. Let each voter be given two votes; he can divide them between two candidates or give both to the same candidate. The candidates' votes are totaled, and the top two are admitted. Now suppose there are three candidates—Joe DiMaggio, Marv Throneberry, and Bob Uecker.* Everyone rates DiMaggio at the top, but the electors are split equally between the other two. I know that DiMaggio is sure to get in, so as a Marv Throneberry fan I give my two votes to him to increase his chances over Bob Uecker. Of course everyone else is equally subtle. The result: Throneberry and Uecker are elected and DiMaggio gets no votes.

Government expenditure projects naturally compete with one another so long as the total budget is limited or congressmen and senators have strong preferences over the size of the budget. We will leave you to think which, if any, is the DiMaggio project, and which ones are the Throneberrys and Ueckers of federal spending.

LOVE A LOATH'D ENEMY

The incentive to distort one's preferences is a common problem. One instance occurs when you can move first and use this opportunity to influence others.⁹ Take, for example, the case of charitable contributions by foundations. Suppose there are two foundations, each with a budget of \$250,000. They are

presented with three grant applications: one from an organization helping the homeless, one from the University of Michigan, and one from Yale. Both foundations agree that a grant of \$200,000 to the homeless is the top priority. Of the two other applications, the first foundation would like to see more money go to Michigan, while the second would prefer to fund Yale. Suppose the second steals a march and sends a check for its total budget, \$250,000, to Yale. The first is then left with no alternative but to provide \$200,000 to the homeless, leaving only \$50,000 for Michigan. If the two foundations had split the grant to the homeless, then Michigan would have received \$150,000, as would Yale. Thus the second foundation has engineered a transfer of \$100,000 from Michigan to Yale through the homeless.

In a sense, the foundation has distorted its preferences—it has not given anything to its top charity priority. But the strategic commitment does serve its true interests. In fact, this type of funding game is quite common.* By acting first, small foundations exercise more influence over which secondary priorities get funded. Large foundations and especially the federal government are then left to fund the most pressing needs.

This strategic rearranging of priorities has a direct parallel with voting. Before the 1974 Budget Act, Congress employed many of the same tricks. Unimportant expenditures were voted on and approved first. Later on, when the crunch appeared, the remaining expenditures were too important to be denied. To solve this problem, Congress now votes first on budget totals and then works within them.

When you can rely on others to save you later, you have an incentive to distort your priorities by exaggerating your claim and taking advantage of the others' preferences. You might be willing to gain at the expense of putting something you want at risk, if you can count on someone else bearing the cost of the rescue.

CASE STUDY: THE TIE OF POWER

Recent presidential elections have emphasized the importance of the selection of the vice president. This person will be just a heartbeat away from the presidency. But most candidates for president spurn the suggestion of the second spot on the ticket, and most vice presidents do not seem to enjoy the experience.*

Only one clause of the Constitution specifies any actual activity for the vice president. Article I, Section 3.4, says: "The Vice-President of the United States shall be President of the Senate, but shall have no vote, unless they be equally

divided.” The presiding is “ceremony, idle ceremony,” and most of the time the vice president delegates this responsibility to a rotation of junior senators chosen by the senate majority leader. Is the tiebreaking vote important, or is it just more ceremony?

Case Discussion

At first glance, both logic and evidence seem to support the ceremonial viewpoint. The vice president’s vote just does not seem important. The chance of a tie vote is small. The most favorable circumstances for a tie arise when each senator is just as likely to vote one way as the other, and an even number of senators vote. The result will be roughly one tie vote in twelve.[†]

The most active tiebreaking vice president was our first, John Adams. He cast 29 tiebreaking votes during his eight years. This is not surprising, since his Senate consisted of only 20 members, and a tie was almost three times more likely than it is today, with our 100-member Senate. In fact, over the first 218 years, there have been only 243 occasions for the vice president to vote. Richard Nixon, under Eisenhower, tied for the most active twentieth-century vice president, casting a total of 8 tiebreaking votes—out of 1,229 decisions reached by the Senate during the period 1953–1961.^{*} This fall in tiebreaking votes also reflects the fact that the two-party system is much more entrenched, so that fewer issues are likely to cross party lines.

But this ceremonial picture of the vice president’s vote is misleading. More important than how often the vice president votes is the impact of the vote. Measured correctly, the vice president’s vote is roughly equal in importance to that of any senator. One reason the vice president’s vote matters is that it tends to decide only the most important and divisive issues. For example, George H.W. Bush’s vote, as vice president, saved the MX missile program—and with it helped hasten the collapse of the Soviet Union. This suggests that we should look more closely at just when it is that a vote matters.

A vote can have one of two effects. It can be instrumental in determining the outcome, or it can be a “voice” that influences the margin of victory or defeat without altering the outcome. In a decision-making body like the Senate, the first aspect is the more important one.

To demonstrate the importance of the vice president’s current position, imagine that the vice president is given a regular vote as president of the Senate. When does this have any additional impact? For important issues, all 100 senators will try to be present.[†] *The only time the outcome hinges on the vice*

president's 101st vote is when the Senate is split 50:50, just the same as when the vice president has only a tiebreaking vote.

The best example of this is the 107th Congress during the first George W. Bush administration. The Senate was evenly split, 50:50. Thus Vice President Cheney's tiebreaking vote gave the Republicans control of the Senate. All 50 Republican senators were pivotal. If any one had been replaced, control would have shifted to the Democrats.

We recognize that our account of a vice president's voting power leaves out aspects of reality. Some of these imply less power for the vice president; others, more. Much of a senator's power comes from the work in committees, in which the vice president does not partake. On the other hand, the vice president has the ear and the veto power of the president on his side.

Our illustration of the vice president's vote leads to an important moral of wider applicability: anyone's vote affects the outcome only when it creates or breaks a tie. Think how important your own vote is in different contexts. How influential can you be in a presidential election? Your town's mayoral election? Your club's secretarial election?

"The Shark Repellent That Backfired" in chapter 14 offers another case study on voting.