How to Improve Ranked-Choice Voting and Democracy

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Abstract

The essay explains how ranked-choice voting leads to election outcomes that better represent what voters want compared with first-past-the-post, the traditional American voting system. It also shows that there is an even better system: majority-rule.

Keywords: Political Processes: Rent-seeking, Lobbying, Elections, Legislatures, and Voting Behavior.

It is hard to have vibrant capitalism without vibrant democracy. Yet American democracy, in particular, could use a boost. And since voting is central to democracy, one way to provide such a boost might be to improve our voting system. That is the theme of this essay.

I'll start by talking about ranked-choice voting, partly because New Yorkers have had direct experience with it recently in the Democratic mayoral primary. For non–New Yorkers, let me quickly review how ranked-choice voting works. Rather than just voting for a single candidate, as in the traditional (first-past-the-post) system, voters get the opportunity to rank the candidates on the ballot. In New York, voters were limited to ranking five candidates, but in many other places there's no limit. If a candidate happens to be ranked first by a majority of voters, that's it: that candidate wins. But if no one gets a majority, we drop the candidate who is ranked first by the fewest voters. Then, the people who voted for this candidate have their second choice moved into first place. And we check whether someone has now acquired a majority. If not, we repeat the process of elimination until a candidate with a majority emerges.

The first thing to note is that ranked-choice voting is a great improvement over first-past-the-post. To see this, consider the 2016 Republican presidential primaries, in which there were about 16 candidates at first. But only a few survived more than a few weeks, among them Donald Trump, Marco Rubio, and John Kasich. Let's imagine that, in some primary, voters broke down into three groups, as shown in table 1: Trump supporters (40%), who prefer Trump to Kasich to Rubio; Rubio supporters (25%), who rank Rubio over Kasich over Trump; and Kasich supporters (35%), who prefer Kasich to Trump to Rubio. These are hypothetical numbers, but not too hypothetical; they reflect a pattern in the early 2016 primaries, in which there were more people against Trump than for him. Yet the anti-Trump vote was split, so Trump often emerged with a plurality.

Table 1: 2016 Republican Primary		
40%	25%	35%
Trump	Rubio	Kasich
Kasich	Kasich	Trump
Rubio	Trump	Rubio

That's true in this example. Under first-past-the-post, Trump wins because 40% is bigger than 35% or 25%. But you'll notice that 60% of the voters actually prefer Kasich to Trump: Rubio supporters have this preference and so do Kasich supporters. And with 60% of voters preferring Kasich, it doesn't seem democratic for Trump to be the winner. Indeed, the only reason Kasich loses is that Rubio spoils the election for him by splitting off some of his support.

Ranked-choice voting resolves the vote-splitting problem here. Given that no one gets a majority of first-place votes, Rubio is dropped because he gets the fewest of them (only 25%). Then Kasich moves into first place for Rubio supporters and thereby commands 60% of the first-place vote, giving him the victory.

However, as good as it is, ranked-choice voting doesn't always solve vote-splitting. To see this, let's turn to the 2020 presidential race. As it turned out, Joe Biden got the Democratic nomination (and beat Trump in the general election). But imagine that Bernie Sanders had

been nominated instead, which seemed a serious possibility until the South Carolina primary. Let's suppose further—as many moderate Democrats feared—that Trump would have defeated Sanders in a head-to-head matchup, as illustrated in table 2, where we suppose that Trump has a 55% to 45% edge.

Table 2: 2020 Matchup between Sanders and Trump	
45%	55%
Sanders	Trump
Trump	Sanders

Assume that, alarmed by this prospect, a centrist such as Michael Bloomberg had jumped into the race as an independent (Bloomberg talked openly about running in 2016 should Sanders be nominated). That might have changed the political landscape to something like that in table 3, in which there are now four groups of votes: Sanders supporters (35%), who prefer Sanders to Bloomberg to Trump; Trump supporters (45%) who rank Trump over Bloomberg over Sanders; and Bloomberg supporters (20%), half of whom prefer Bloomberg to Sanders to Trump and the other half Bloomberg to Trump to Sanders.

Table 3: 2020 General Election including Bloomberg			
35%	10%	10%	45%
Sanders	Bloomberg	Bloomberg	Trump
Bloomberg	Sanders	Trump	Bloomberg
Trump	Trump	Sanders	Sanders

Notice that under conventional voting, Bloomberg does not prevent Trump from winning; Trump's plurality is simply reduced from 55% to 45%. But even under ranked-choice voting, Trump wins. With only 20% of the first-place vote, Bloomberg gets eliminated first. So then it's back to Trump versus Sanders, where, as we've already seen, Trump has the edge.

Yet there is a clear-cut sense in which Bloomberg is actually the most popular candidate in this example: 55% of voters (Bloomberg plus Sanders supporters) prefer him to Trump, and 65% (Bloomberg plus Trump supporters) prefer him to Sanders. That is, Bloomberg is the winner according to the voting system majority-rule, in which voters rank candidates (as in ranked-choice voting), and the candidate who would beat each other candidate head-to-head by a majority is elected. Majority-rule was first intensively studied and recommended by the Marquis de Condorcet, an eighteenth-century mathematician and philosopher.

The reason Bloomberg doesn't get elected under ranked-choice voting is again vote splitting: Although a majority of voters prefer Bloomberg to Trump, Sanders splits the anti-Trump support with Bloomberg. Moreover, although a majority of voters prefer Bloomberg to Sanders, Trump splits the anti-Sanders support. The upshot is that, despite his popularity, Bloomberg is actually eliminated first under ranked-choice voting.

In the language of Arrow (1951), voting systems that always avoid vote splitting are said to satisfy independence of irrelevant alternatives (IIA). Specifically, IIA entails that if the electorate is choosing between candidates A and B, which of them gets elected should not be affected by how voters regard some third candidate C. Majority-rule clearly satisfies IIA because, by definition, it examines just two candidates at a time. And as we have seen, ranked-choice voting violates IIA, since the choice between Bloomberg and Trump is affected by how much support Sanders attracts.

Thus, majority-rule is superior to ranked-choice from the standpoint of IIA. But we might ask whether there are other criteria by which ranked-choice voting is better than majority-rule, or by which some other voting rule is superior to them both.

The way to answer such a question is by first asking, What are the criteria or principles that any good voting system should satisfy? There are several widely accepted principles of this type in the voting literature.

The first is the *consensus* principle (economists call it the Pareto principle, after Vilfredo Pareto). It's the idea that if all voters agree that candidate A is better than B, then B had better not be elected. Indeed, it would be perverse to elect B under those circumstances. Obviously, both ranked-choice voting and majority-rule satisfy the consensus principle.

The second principle says that every voter should count equally. It is hard to quarrel with that; in a democratic society, all voters should have the same weight. This is sometimes called *anonymity* because it requires that a person's identity is irrelevant to her vote's effect on the outcome of the election. (By the way, I note that the US Electoral College violates anonymity, because your identity *does* matter there—that is, your influence will depend on what state you are from.) Note that majority-rule and ranked-choice voting clearly satisfy anonymity.

A third basic principle is *neutrality*, which says that we should treat all candidates equally; the rules should not discriminate in favor of one candidate over another (e.g., we shouldn't privilege an incumbent). Once again, majority-rule and ranked-choice voting both satisfy this principle.

Thus, both ranked-choice voting and majority-rule satisfy consensus, anonymity, and neutrality. The principle on which they differ is IIA: majority-rule satisfies it and ranked-choice voting doesn't. So, at this point, it appears that ranked-choice voting is inferior to majority-rule.

But there's one additional important principle that makes things more complicated. And that's the idea that a voting system should always result in a clear-cut winner—that it satisfies *decisiveness*. There is, in fact, a problem with majority-rule on these grounds. Here's an example (see table 4). Suppose there are three candidates, A, B, and C, and three approximately equal-sized groups of voters. Group 1 has ranking A over B over C; group 2 has ranking B over C over A; and group 3 has ranking C over A over B. Notice that (approximately) a two-thirds majority prefers A to B, B to C, and C to A. So, in this example, there's *no* candidate that gets a majority against every other candidate. This is a flaw in majority-rule that Condorcet himself recognized—in fact, the majority preferences A over B, B over C, and C over A together constitute what is called a Condorcet cycle.

Table 4: A Condorcet Cycle		
34%	33%	33%
A	B	C
B	C	A
C	A	B

Now, although Condorcet cycles are a theoretical problem, they rarely happen in practice. And in cases where they don't happen, majority-rule is decisive. Nevertheless, I want to take the problem of possible indecisiveness seriously. The ideal solution would be, of course, a voting rule that satisfies all five principles. If there were one, that would be wonderful. But many of you may recall the Arrow impossibility theorem. That theorem says, essentially, that there *is* no voting rule satisfying all five principles.

Still, the Arrow theorem is too negative. It insists that a voting rule has to satisfy these principles in all circumstances. Yet some circumstances are quite unlikely. As I just mentioned, for example, Condorcet cycles rarely occur. And so, an appropriate goal is to find a voting rule satisfying the five principles *more often* than any other.

That brings me to the following result that I obtained with Partha Dasgupta (Dasgupta and Maskin 2008). What we show is that, in fact, majority-rule satisfies the five principles most often. More specifically, if there are circumstances where another voting rule satisfies the five principles, then majority-rule must also satisfy them in those circumstances. And, furthermore, there will exist other circumstances where majority-rule satisfies the five principles and the alternative voting rule does not. That is, there is a precise sense in which majority-rule dominates every other voting system.

To come back to ranked-choice voting, there's no doubt that it's a step forward. But majority-rule should be the next step after that.

A Conversation

Editor's note: there follows an edited transcript of the conversation that ensued after the presentation of this paper at the Center on Capitalism and Society on November 5, 2021.

Richard Robb (Columbia University): I have two questions, Eric. First, in the Democratic mayoral primary in New York, would there have been a Condorcet cycle? I assume not. And would Eric Adams have won?

Eric Maskin: We know the answers here because we have the ranking data from the primary. There would *not* have been a Condorcet cycle. And, yes, Eric Adams would have won a majority-rule election; Adams was the majority winner.

Robb: My second question is if majority-rule were to be announced as the new system for electing our mayor, there would have to be, when it was announced, a Condorcet-cycle-breaking rule that would be appended to it. What would you propose that to be?

Maskin: Actually, to run a majority-rule election, we can use almost the same rules as for ranked-choice voting: Namely, voters first rank the candidates, and if someone gets more than 50% of the first-place vote, she wins. If not, then under ranked-choice rules, we would eliminate the candidate who was ranked first least often. But instead of that, suppose we have

an instant runoff between the *two* candidates who get the fewest first-place votes. That is, if A and B have the fewest first-place votes, we see whether more people rank A above B or B above A, and whichever one of them loses in that comparison is eliminated. If you make that one small change to the rules, you get majority-rule. Furthermore, the voting rule will be decisive: there will always be a winner (who will be the majority winner if there is one).

Robb: So just to be clear, this instant-runoff rule will converge to the majority-rule when a majority winner exists. If there is a majority winner, this voting rule will give you that winner; if not, it will give you something else. That's ingenious.

Larry Udell (West Chester University): I would be interested to learn what you think about the proposal by Glen Weyl and Eric Posner for quadratic voting.[1]

Maskin: I have talked with Glen Weyl a lot about quadratic voting. For those of you who haven't heard of it, it's a voting rule that allows people to buy votes—and the cost is quadratic in the number of votes they buy. This is a way to incorporate intensity of preference into voting. Suppose that I prefer option A and two other people prefer option B. Under conventional voting, they would outnumber me, and so there's no way I could get A passed. But suppose I care more about A than they do about B. Then I might be willing to buy enough votes to get A passed after all.

This might be a great idea if we were talking about a corporation. Shareholders who strongly care that candidate A should be the CEO could have more influence than their proportion of shares in the corporation would allow. For political elections, however, quadratic voting is a complete nonstarter. I think most of us would recoil at the idea that rich people could buy votes simply by virtue of being rich. So, good idea, bad application.

Audience member A: I believe that one of the reasons why the voting system inspires so much trust, particularly the American system, is because it seems to be timeless. It seems to not change. How do you build trust in a system that is constantly changing? You're already proposing some tweaks on the new ways to do things.

Maskin: You do have a point that familiarity is an important consideration when it comes to important institutions like voting. But one thing I like about American democracy is that we can change voting rules in a gradual way. It's up to each individual state and, for some purposes, each individual city, how it conducts its elections. This has enabled ranked-choice voting to catch on little by little. It was first adopted by a number of cities like San Francisco and Minneapolis to elect their mayors (and of course by New York). Based on its success in the cities, it's also been adopted by two states—Maine and Alaska—for congressional elections. At this point, there are other states considering it, and they can benefit from the experiences of Maine and Alaska. They might say, Hey, this has been working well. Why don't we try it out here? As for majority-rule, as I said, it's a small step procedurally to go from ranked-choice voting to majority-rule. I think once people are already comfortable with ranked-choice voting, then the next step will be to go to an even better voting system.

Philip K. Howard (Common Good): A point of clarification on majority-rule: If you have 18 candidates, simply having one instant runoff between the two at the bottom doesn't solve the

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[1] See Posner and Weyl (2013).

problem. You have to keep doing that. You'll have to keep doing it, eliminating one candidate at a time, until someone gets a majority among the remaining candidates. So it's just a computer program. Clink, clink, clink, clink, clink, and then 10 seconds later, it has some person with the majority?

Maskin: Yes, that's right. Almost, the same computer program for ranked-choice voting that was used by New York City with 12 candidates could be used for majority-rule with 18 candidates. Voting systems like ranked-choice voting and majority-rule have been greatly facilitated by the fact that we now have very fast computers that can do the actual vote counting almost instantly. The reason why the vote was not counted quickly in New York had nothing to do with the computers. It was that the board of elections didn't allow absentee ballots to be counted before election day. There wouldn't have been a delay at all if not for that rule.

Michele Gelfand (Stanford University): I'm wondering if you'd recommend the system in a context that's close to home for all of us, which is faculty hiring. I think we've all been in situations where we wind up with the person chosen being the least preferred candidate. So have you seen any departments including your own doing this?

Maskin: I am proud to say that I persuaded the Harvard math department (not yet the Harvard economics department) to use majority-rule. Every year they get a large number of postdoc applications and use majority-rule voting to rank the candidates. This has been happening for about four years now. I think they're pretty happy with the system, but you should speak to them about it yourself.

Howard: As somebody who went through the whole New York process, I found it was a lot of work to figure out the five candidates I wanted to vote for. Ultimately, Eric Adams got the most first-place votes and then continued to get the most first-place votes through the whole process; in the end, he ended up winning. So I guess my question is: How often does the first-place candidate after the first round, and even many rounds after that, diverge from who the final winner is, and therefore, how often does it justify the amount of work one has to go through?

Audience member B: Could I report about the Maine election in 2018? The congressman from the second district, who happens to be a Democrat, only was elected because of ranked-choice voting.

Maskin: Right. I was actually a little bit sorry about that outcome. Not because I wasn't happy with who won, but because it seemed to send the message that ranked-choice voting is a reform that favors Democrats over Republicans. And it's not. It's entirely nonpartisan. That's another reason why I think that it stands a chance of being widely adopted: in principle, there's no more reason why Republicans should oppose it than Democrats. But because of that experience in Maine, some Republicans decided that they weren't going to support it. And that was unfortunate. I think Republicans will have to be beneficiaries of ranked-choice voting a few times themselves for them to get on board.

But the answer to the question how often ranked-choice voting does make a difference is provided by Australia, where ranked-choice voting has been used for over 100 years and where we have reams of data. It's about 12% of the time. So, most of the time, ranked-choice

voting doesn't change the first-past-the-post outcome but does so enough to make a significant difference.

And I can point to many cases from American political history where, had ranked-choice been used, history would have been different. I already mentioned the 2016 Republican primary. You probably also remember the infamous election of 2000 between Al Gore and George W. Bush, where Gore lost by 550 or 560 votes in Florida. What is sometimes forgotten is that over 90,000 people voted for Ralph Nader in Florida. If there had been ranked-choice voting, probably most of those Nader voters would have put Gore second. And that would have been more than enough for Gore to have won in Florida. So that's just one of many episodes in American history where ranked-choice voting would have made a big difference.

Robb: When I was voting in New York, I found it much less work to vote using ranked-choice voting, because I didn't need to strategize at all. I could just rank candidates according to how I liked them.

Maskin: Yes, ranked-choice voting reduces the need to strategize, to try to guess how other citizens are going to vote so that you can react optimally to them. In fact, majority-rule reduces the need for gaming even more. And that's really a good thing because, as you suggest, strategizing is hard for voters. It's difficult enough for a voter to figure out her own preferences. If, on top of that, she has to figure out everyone else's, she faces a huge burden.

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