

How Should Presidents Be Elected?

(based on work with P. Dasgupta)

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What's wrong with this picture?

2000 U.S. Presidential Election

Florida (25 electoral votes)

	<u>vote totals</u>
Bush	2,912,790
Gore	2,912,253
Nader	97,488
Others	40,539

Bush declared the winner in Florida (and therefore of presidency)

- Let's leave aside
 - hanging chads
 - butterfly ballots
 - U.S. Supreme Court
- Bush won Florida's electoral votes without even winning majority (over 50%) of the votes in Florida

Bush	48.8%
Gore	48.8%
Nader	1.6%
Others	0.7%

- Why did this happen?
- Answer: 138,000 voters (2.3%) couldn't express their preference between Bush and Gore (the only serious candidates) since they voted for other candidates
- If they *had* been able to express their preference, then one of the serious candidates *would* have had a majority
- Indeed, good reason to think that large majority of Nader voters would have gone for Gore, giving *him* the victory
- So Nader probably changed outcome of election, even though had no chance of winning himself

- Decisive influence of 3rd party candidates not rare in U.S. or elsewhere
- In 2002 French presidential election
 - nine candidates
 - most prominent were:
 - Jacques Chirac (incumbent)
 - Lionel Jospin (Socialist)
 - Jean-Marie Le Pen (National Front)

- France and Russia have runoff system
 - in first round, each voter votes for one candidate
 - if no candidate gets a majority, then top two vote-getters face each other in a runoff

- In 2002, top three candidates in France were

Chirac 19.9%

Le Pen 16.9% (big surprise)

Jospin 16.2%

- Chirac easily defeated Le Pen in run-off
- What's the problem with this outcome?
 - Evidence suggests Jospin would overwhelmingly win head-to-head contest with Le Pen
(so travesty to have Le Pen in run-off)
 - Jospin might well have beaten Chirac in head-to-head contest
- So Le Pen quite possibly changed outcome in France, even though far out of mainstream

Final example: 1992 U.S. Presidential election

Bill Clinton 42.9% (winner)

George H.W. Bush 37.4%

Ross Perot 18.9%

- Perot may have taken votes primarily from Bush
- Bush might have had majority in absence of Perot
- Perot quite possibly had deciding influence (although won no electoral votes).

So in both 1992 and 2000 U.S. elections

- fringe candidate had possibly decisive effect on outcome
- minority president may have been elected
 - “illegitimacy” contributed to polarization
 - hatred by right for Bill Clinton
 - hatred by left for George W. Bush

Is there a better way to elect presidents?

- Answer: yes
- But first let's examine common proposal that *doesn't* solve problem

Use run-off (or instant run-off) system

- As we saw, such a system does not prevent an extremist candidate (Le Pen) from disrupting choice between the serious candidates

The 1992 and 2000 U.S. and 2002 French elections show that voting for just one candidate does not provide enough information

- Jospin (almost certainly) would have defeated Le Pen in head-to-head contest, but voting system could not take account of this
- similarly, Gore would probably have defeated Bush in Florida head-to-head, but this not reflected in outcome
- Bush may possibly have defeated Clinton in two-way match-up.

- Solution: should have voters provide *rankings* of candidates

e.g. Gore Bush
 Nader or Gore
 Bush Nader

- What should we do with these rankings?

“True” Majority Rule/Condorcet’s method (per Marquis de Condorcet)

- voters submit rankings
- elect candidate who (according to rankings) would beat all the others in head-to-head contests

For example, suppose voters' rankings break down as follows:

<u>2%</u>	<u>49%</u>	<u>48%</u>	<u>1%</u>
Nader	Gore	Bush	Buchanan
Gore	Bush	Buchanan	Bush
Bush	Nader	Gore	Gore
Buchanan	Buchanan	Nader	Nader

- Gore defeats Bush ($2\% + 49\% = 51\%$)
- Gore defeats Nader ($49\% + 48\% + 1\% = 98\%$)
- Gore defeats Buchanan ($2\% + 49\% = 51\%$)

Gore is true majority winner

How might true majority rule apply to 2002 French election?

<u>30%</u>	<u>36%</u>	<u>34%</u>
Jospin	Chirac	Le Pen
Chirac	Jospin	Jospin
Le Pen	Le Pen	Chirac

- If use French/Russian system of run-off between two leading vote-getters, Jospin is eliminated, and Chirac then beats Le Pen (66% to 34%)
- If (as in Florida), everybody votes for just one candidate, and winner is candidate with most votes, Chirac wins
- If use true majority rule, Jospin beats Chirac (64% to 36% and Le Pen (66% to 34%), so Jospin is the true majority winner

- Once voters submit *rankings*, many systems besides true majority rule become possible
- Why limit ourselves to majority rule?

Prominent alternative to majority rule:
Rank-Order Voting/Borda Count (per Jean-Charles Borda)

- if four candidates running, a candidate gets
 - 4 points each time some voter ranks him first
 - 3 points each time he is ranked second,
 - 2 points each time ranked third,
 - 1 point each time ranked last
- candidate with most points wins

Consider same population of voters as before
(assume 100 million voters in all)

<u>2%</u>	<u>49%</u>	<u>48%</u>	<u>1%</u>
Nader	Gore	Bush	Buchanan
Gore	Bush	Buchanan	Bush
Bush	Nader	Gore	Gore
Buchanan	Buchanan	Nader	Nader

- Gore's total $4 \times 49m + 3 \times 2m + 2 \times 49m = 300m$
- Bush's total $4 \times 48m + 3 \times 50m + 2 \times 2m = 346m$
- Bush is rank-order winner
- So true majority rule and rank-order voting lead to *different* outcomes

Which method is better?

- Way to answer question: which method does better job of satisfying some basic desiderata?

Consensus principle/Pareto principle

- if everyone agrees candidate A better than B, B won't be elected
- satisfied by both true majority rule and rank-order voting

Equal-treatment principle/anonymity principle

- all voters should count equally (doesn't matter who you are)
- violated by Electoral College method
- satisfied by true majority rule and rank-order voting

Neutrality

- electoral rules should treat all candidates equally
- Both true majority and rank-order voting satisfy neutrality

“No Nader effect” Principle

(Independence of Irrelevant Candidates)

- which of candidates A and B wins should not depend on whether candidate C is running or not
- True majority rule satisfies IIC (because always compare just 2 candidates at a time)
- But rank-order voting violates IIC

<u>2%</u>	<u>49%</u>	<u>48%</u>	<u>1%</u>	
Nader	Gore	Bush	Buchanan	
Gore	Bush	Buchanan	Bush	Bush wins
Bush	Nader	Gore	Gore	
Buchanan	Buchanan	Nader	Nader	

If Buchanan drops out

Gore wins

So far, true majority rule fares better than rank-order voting

- both satisfy consensus, anonymity, and neutrality
- but only majority rule satisfies IIC

But majority rule has a flaw:

- there may not always be a candidate that beats all the others

<u>35%</u>	<u>33%</u>	<u>32%</u>
Gore	Bush	Nader
Bush	Nader	Gore
Nader	Gore	Bush

Gore beats Bush (67% to 33%)

Bush beats Nader (68% to 32%)

But Nader beats Gore! (65% to 35%)

- this is called a *Condorcet cycle*
- majority rule violates *decisiveness principle*, which requires that a winner always exists
- rank-order voting satisfies decisiveness

- So true majority rule satisfies

consensus

anonymity

neutrality

IIC

- Rank-order voting satisfies

consensus

anonymity

neutrality

decisiveness

Does any voting method satisfy all five principles?

consensus

anonymity

neutrality

IIC

decisiveness

Answer: No

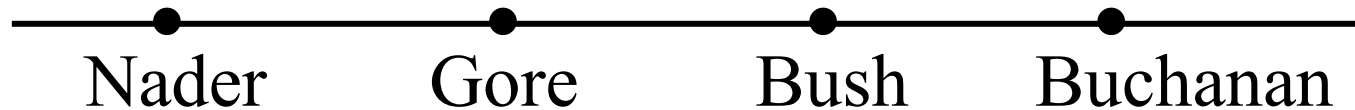
- Implied by Arrow's Impossibility Theorem

But Arrow's theorem too negative

- insists electoral method must work for *any* rankings by voters
- but some rankings may be quite unlikely

For example, for many voters, ideology important

- In 2000 election, had



- Ideological voter ranks candidates according to ideological distance
- Ideology rules out ranking
 - Bush
 - Nader
 - Buchanan
 - Gore
- if most voters' rankings are ideological, then true majority rule *is* decisive

- Other restrictions on rankings can also ensure decisiveness
- Define a voting method to *work well* for restricted class of rankings if it satisfies consensus, anonymity, neutrality, IIC, and decisiveness when voters' rankings drawn from that class

(e.g. true majority rule works well for the class of ideological rankings)

Dasgupta-Maskin Majority Domination Theorem:

- if a voting method works well for some particular class of rankings, then true majority rule also works well for that class
- furthermore, there exists some class of rankings for which true majority rule works well but other voting method does not
- thus, true majority rule works well *more often* than any other method

- Thus there is precise sense in which true majority rule is best
- But true majority rule not always well-defined
 - May be no winner: candidate who beats all others in head-to-head contests (Condorcet cycle)
 - If not, winner is one with highest rank-order score (Black's method)

Virtues of True Majority Rule

- prevents minority winners whenever possible (majority prefers some other candidate to winner)
- prevents fringe candidates from changing election outcome (candidate who can't win himself determines who wins)
- allows voters to register protest without handing election to ideological foe