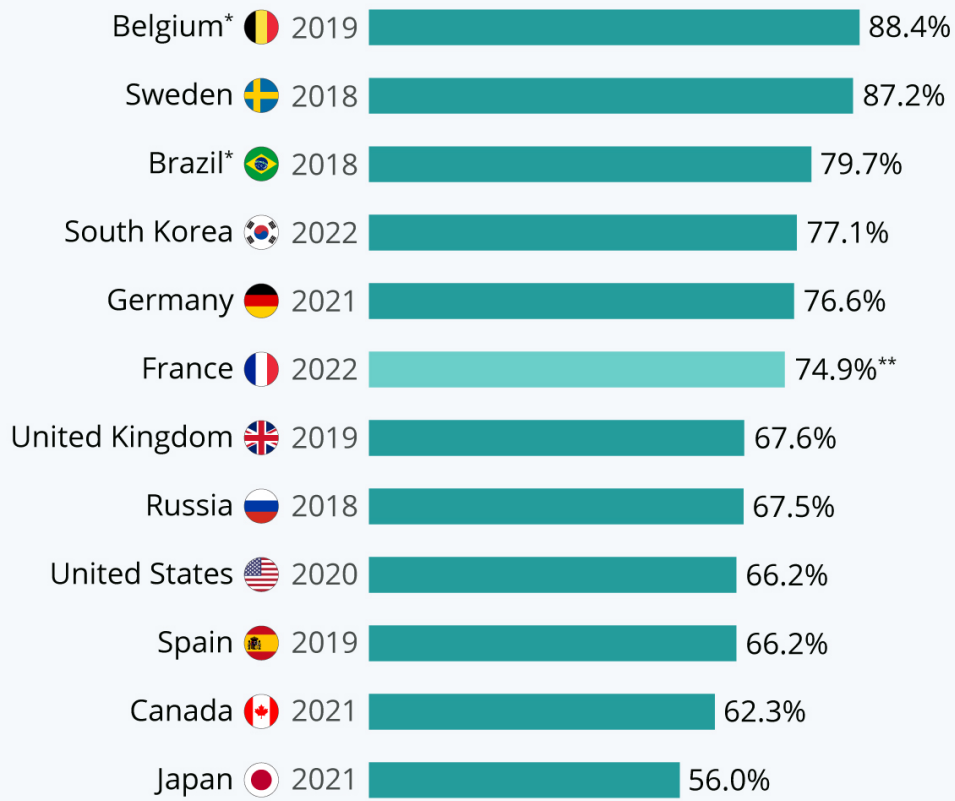
Electoral Competition in Representative Democracy (1)

- Voter participation
- Electoral competition and policy determination

How Voter Turnout Compares Around the World

Voter turnout based on the number of registered voters in the last presidential/national election

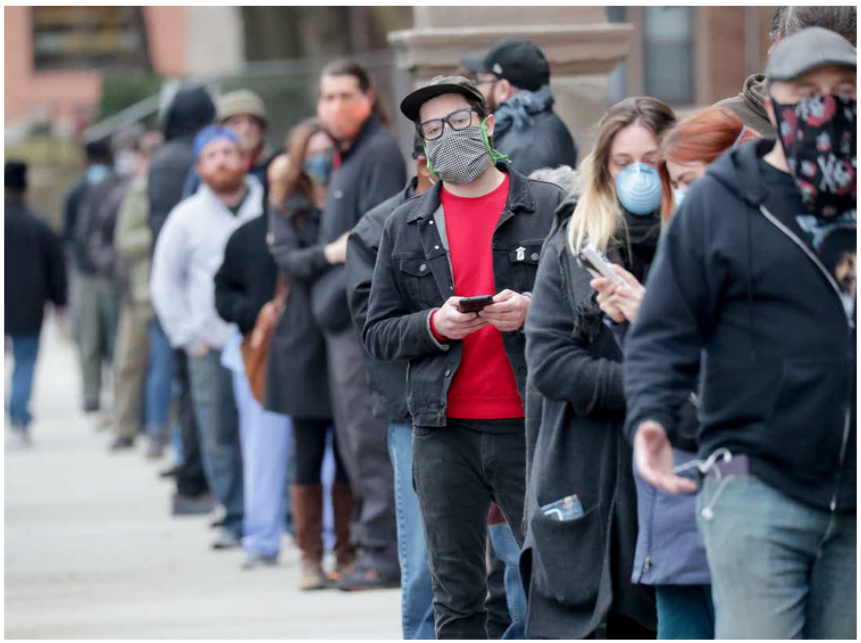


* National law makes voting compulsory though not necessarily enforced
** Based on provisional results as of April 11, 2022, 10:00 (CET)
Sources: International IDEA, French Ministry of the Interior

milwaukee
journal sentinel

'A very sad situation for voters': Milwaukeeans brave wait times as long as 2 1/2 hours, top election official says

Mary Spicuzza | Milwaukee Journal Sentinel
Published 9:49 PM EDT Apr 7, 2020



People line up to vote at Riverside High School in Milwaukee on Tuesday. The Wisconsin primary is moving forward despite the coronavirus epidemic after Gov. Tony Evers sought to shut down Tuesday's election in a historic move Monday that was swiftly rejected by the conservative majority of the Wisconsin Supreme Court.
MIKE DE SISTI / MILWAUKEE JOURNAL SENTINEL

An instrumental calculus of voting

An *instrumentally rational* voter will cast a vote if

$$p \cdot B > c$$

where

- $p =$ probability that a single vote swings election (voter is *pivotal*)
- $B =$ individual benefit of getting the preferred candidate elected[†]
- $c =$ individual's voting cost

[†] Strictly speaking: The voter would have to consider two scenarios: (a) aside from his own vote, the votes are tied, and (b) aside from his own votes, the candidate he intends to support is one vote behind. In case (a), his vote can cause his own candidate to win instead of having a tie. In case (b), his vote causes a tie instead of a loss. Each of these events will be associated with some benefit.

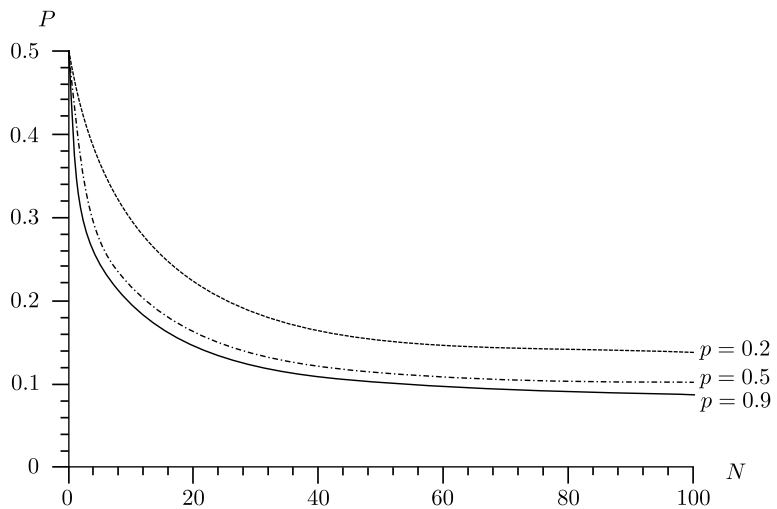
Pivotal voter model (Palfrey and Rosenthal 1985)

- Election between two parties $1, 2$
- Proportion supporting each candidate known: σ_1, σ_2
- Voting is purely instrumental: winner's supporters obtain benefit B

Individual participation decision

- Depends on probability of being pivotal, which depends on
  - Overall participation rate p (probability that a given voter votes)
  - 'Closeness' of the race (difference $\sigma_1 - \sigma_2$)

Example ($\sigma_1 = \sigma_2 = 0.5$)



Pivotal voter model (Palfrey and Rosenthal 1985)

- No participation ($p = 0$) is not an equilibrium
  - if no one votes, any one person can swing election
  - ... so *some* people have to be voting.
- Palfrey and Rosenthal (1985) allow
  - Heterogeneous costs of voting
  - Participation depends on voting cost and party affiliation
- Main results:
  - Higher participation when election is 'close'
  - Higher turnout among minority supporters ('underdog' effect)
  - Participation declines with population size N
- Extensions
  - Aguiar-Conraria and Magalhaes (2010) introduce quorum rules.
    - quorum rules introduce additional ways to be pivotal
    - discourages opponents and encourages supporters in referenda
  - Aguiar-Conraria, Magalhaes, and Vanberg (2013) investigate their model in a laboratory experiment.

Objection: In fact, p is *essentially zero* in all major elections!

Knappe Wahl

FDP schafft Sprung in Thüringer Parlament

ERFURT. Nach zehn Tagen der Unsicherheit atmeten die Liberalen in Thüringen am Donnerstag auf, als der Landeswahlleiter das amtliche Endergebnis der Landtagswahl vom 27. Oktober bekanntgab. Danach zieht die FDP mit fünf Prozent der Stimmen in den Landtag in Erfurt ein und ist damit wieder in einem ostdeutschen Parlament vertreten. Am Wahlabend hatte die Partei mit lediglich fünf Stimmen die Fünf-Prozent-Hürde übersprungen. Nach abermaliger Auszählung aller Wahlkreise kommt die Partei nun auf einen komfortableren Vorsprung von 73 Stimmen.

Gleichwohl ist es das knappste Wahlergebnis für die Liberalen bei einer Landtagswahl überhaupt. Bisher hielten sie diesen „Rekord" in Hamburg, wo der FDP 2001 mit 611 Stimmen mehr als nötig der Einzug in die Bürgerschaft gelang, und in Hessen, wo sie 2013 911 Stimmen über der Hürde lag. Die Wahl habe wieder einmal gezeigt, wie wichtig jede einzelne

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Bei den Landtagswahlen in Brandenburg und Sachsen Anfang September verfehlte die FDP den Einzug in die Landtage. Für die Regierungsbildung in Thüringen ist der Einzug der Liberalen nicht von entscheidender Bedeutung. Allerdings steigt dadurch die Chance auf eine eventuelle rot-rot-grüne Minderheitsregierung. Linke, SPD und Grüne haben sich bisher grob darauf verständigt, ihre Zusammenarbeit fortzusetzen. Für eine Mehrheit im Landtag fehlen dem Bündnis jedoch vier Stimmen. Zwar hat FDP-Chef Kemmerich eine Koalition oder Tolerierung von Rot-Rot-Grün ausgeschlossen, sich aber eine

It follows from this that

- *either* people who vote are being *irrational*,
- *or* they are doing so for *"non-instrumental"* reasons.

(click here for a laugh)

Non-instrumental benefits (Riker and Ordeshook 1970)

- Pleasure from fulfilling an ethical norm (‘citizen duty’)
- Expressing support for (‘affirming allegiance to’) the political system
- Expressing support for a political party or candidate
- Interest in politics (enjoying the decision-making process itself)
- Feeling important / taking part in democratic process

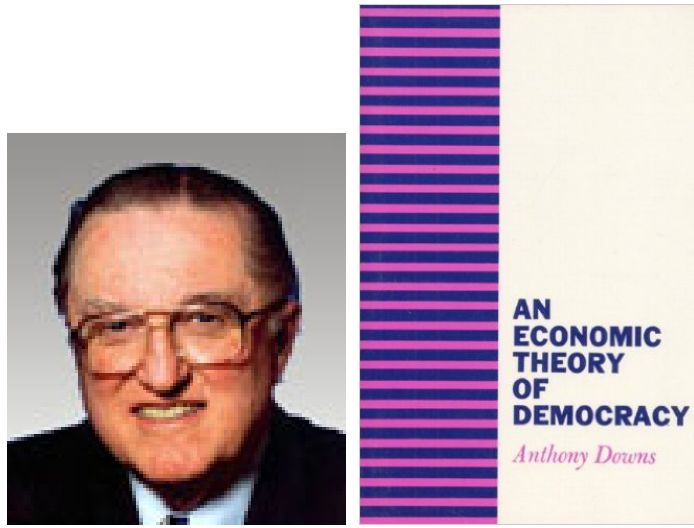
(The importance of these factors is supported by survey evidence.)

Electoral competition and policy determination

Outline:

1. Competition between two candidates or parties
   - The Downsian model and extensions
   - Multiple dimensions, probabilistic voting
2. Competition between three or more candidates
   - Sincere vs. strategic voting
   - Alternative voting rules

Downsian Electoral Competition



“Parties formulate policies in order to win elections, rather than win elections in order to formulate policies.” (DOWNS 1957)

Basic model with two candidates

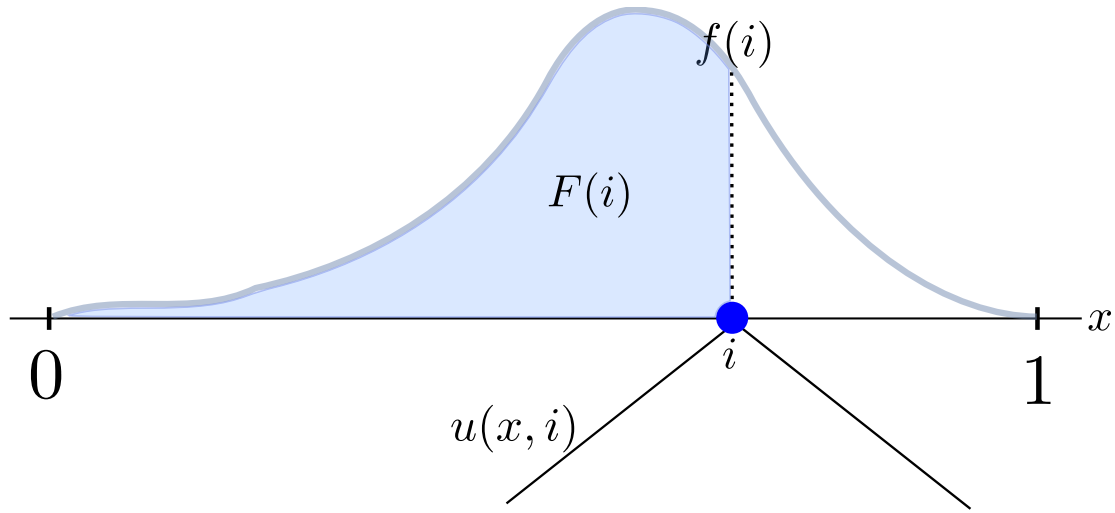
- Policies: $x \in [0, 1]$ (left-right)
- Voters care about the policy (utility depends on policy)
- 2 candidates A, B (exogenous)
- To start, we will assume:
  (1) Candidates are **office motivated:** They just want to *win*
  (2) Candidates can **credibly commit** to any policy position during the election campaign
- Voters vote *sincerely* (for the candidate whose policy position they prefer)

Voters

- Voters have *single-peaked* distance preferences over policy x, represented by

$$u(x, i) = -|i - x|$$

- Voter ideal points are distributed according to CDF $F(i)$

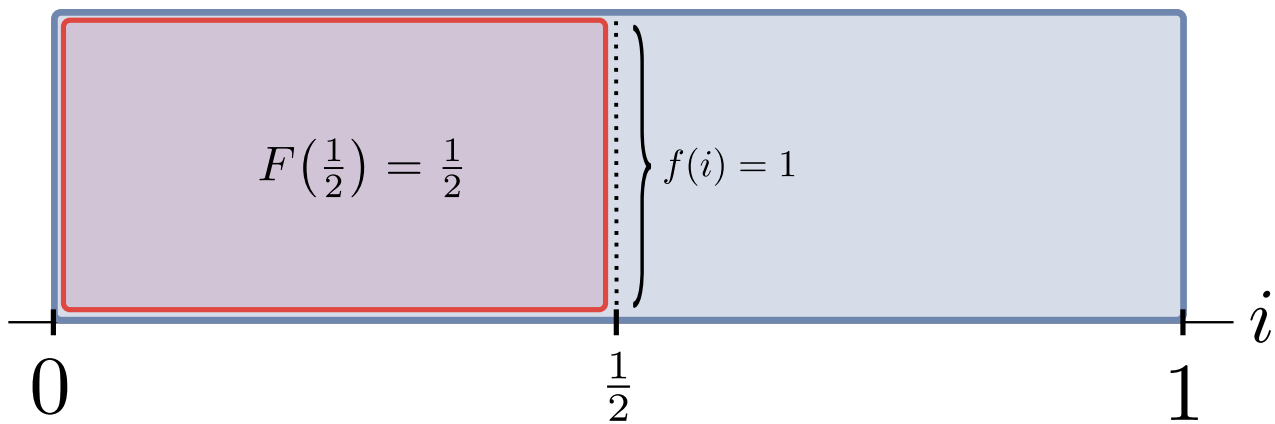


- We assume:
  - $f(i) > 0$ for all $i \in [0, 1]$
  - There is a unique $i_M \in [0, 1]$ for which $F(i_M) = \frac{1}{2}$. (The ideal point of the median voter(s).)

Technical side note: Note that voters form a 'continuum', i.e. they are smoothly 'spread out' over the interval [0, 1]. This looks fancy but actually makes things *easier* than if they were located at discrete points.

Voters - Example

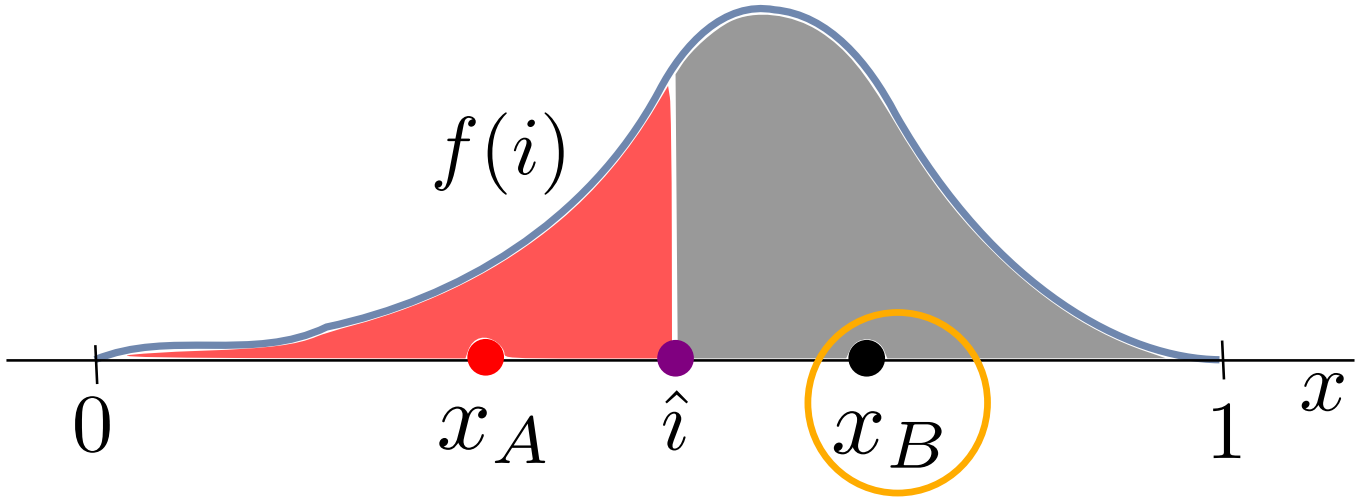
- Ideal points are *uniformly* distributed on $[0, 1]$
- Then for all i between 0 and 1,
  - $f(i) = 1$
  - $F(i) = i$



- Median voter $i_M = \frac{1}{2}$

Candidates

- 2 candidates A, B
- *Office motivated*
  - Payoff $R > 0$ if elected, 0 otherwise
  - Candidate payoff *does not* depend on policy chosen
- $x_J \in [0, 1]$ candidate J's policy position
  - Announced prior to election
  - *Binding* (must be implemented if candidate wins)



Game

1. Each candidate chooses a position x_J
   - For example: $x_A < x_B$
2. Each citizen compares the utility from candidate positions
   - Indifferent voter(s): $u(x_A, \hat{\imath}) = u(x_B, \hat{\imath})$
3. Each citizen votes for her preferred candidate
   - All voters $i < \hat{\imath}$ vote for A
   - All voters $i > \hat{\imath}$ vote for B
   - The fraction voting for A is $\pi_A = F(\hat{\imath})$
4. Candidate with most votes is elected and implements x_J (Tie $\rightarrow$ coin flip)

Example

- *Uniform* distribution of ideal points on $[0, 1]$
- Candidate A chooses $x_A = \frac{1}{8}$
- Candidate B chooses $x_B = \frac{3}{4}$

Exercise (Now):

- Identify the indifferent voter, $\hat{i}$
- What is candidate A's vote share?

Definition: A pair of policy positions (x_A^*, x_B^*) is an *equilibrium* if x_J^* maximizes the probability that candidate J wins, given x_{-J}^*.

Median Voter Theorem: There exists a unique (Nash) equilibrium, with $x_A^* = x_B^* = x_M$.

Proof

- The reason for the result is that x_M^* is a *Condorcet winner* (by Black's Theorem). Indeed, note that x_M^* has the slightly stronger property that it will strictly *defeat* any other option in a pairwise vote. We can use this fact to prove the result.
- To show that $x_A^* = x_B^* = x_M$ is an equilibrium, consider candidate A. We need to show that choosing $x_A = x_M$ maximizes her probability of winning when B chooses $x_B = x_M$. Given these choices, she would receive half of the votes and win with probability $\frac{1}{2}$. Since x_M is a Condorcet winner, no other position can get A more than half of the votes as long as $x_B = x_M$. So there is no way to increase her probability of winning. The same argument can be made for candidate B.
- To show that this equilibrium is *unique*, suppose there exists another equilibrium, and suppose (w.l.o.g.) that $x_A^* \neq x_M$ in this equilibrium. Then if candidate A gets fewer than half of the votes (loses for sure), she can improve her chances by moving to x_M (and *at least* tie to win with prob $\frac{1}{2}$). If she gets half of the votes or more, candidate B must be choosing $x_B^* \neq x_M$ and so he can improve by moving to x_M (and win for sure). Therefore at least one candidate is not maximizing his probability of winning. This contradicts the assumption that there is an equilibrium in which $x_A^* \neq x_M$, proving that no such equilibrium exists.

Implications

- Downs' theory predicts that two-party electoral competition favors *moderate* candidates and policies.
- Both parties have incentives to 'move towards' their competitor.
- Both parties should take similar, moderate policy positions.

Questions

- Is this prediction robust to modifications of the model?
- What explains the polarization we see in some two-party systems such as the US?
  - What if politicians care about *policy* (instead of just winning)?
  - What if voters do not turn out if the candidates' positions are too similar?
  - What if partisan voters fail to turn out if their candidate is too moderate?
- Clearly, the model is missing something important. What is it?

Extensions of the basic model

- Policy motivated candidates
  - With commitment to the announced policy platform
  - Without commitment to announced policy platform
- Voter abstention
  - Due to indifference (homework)
  - Due to alienation (readings)

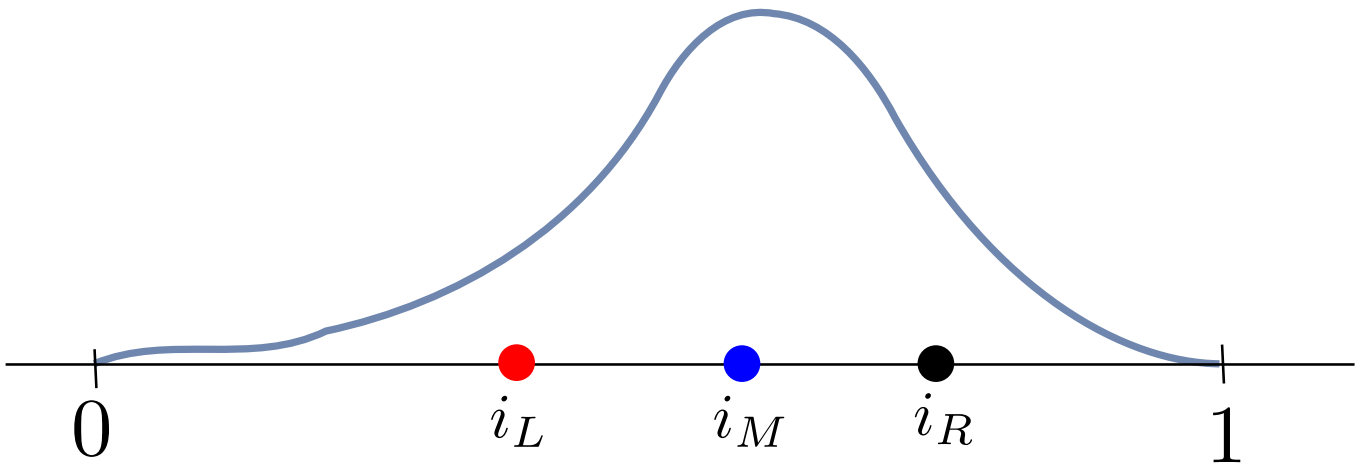
Policy motivated candidates

- Candidates have preferences over *policy*, same as voters.

$$u(x, i_K) = -|i_K - x|$$

  where x is the policy implemented by the winner.

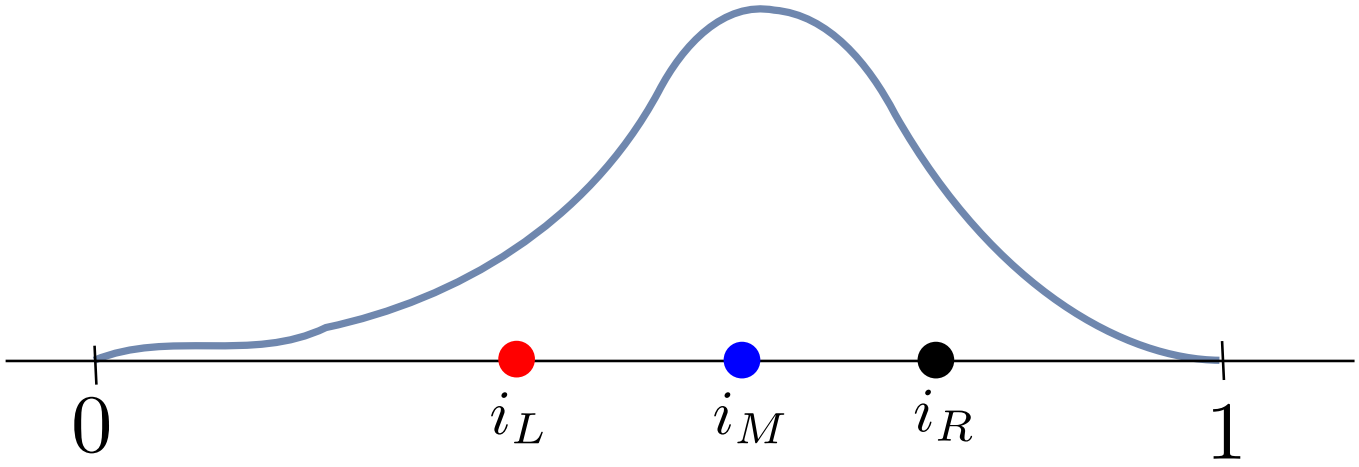
- Candidate ideal points: $i_L < i_M < i_R$
- Choose platforms to maximize utility from the resulting policy.



Game (as before)

- candidates announce x_K
- voters vote for preferred candidate, anticipating her policy choice.
- candidates implement a policy

Policy Motivated Candidates



With commitment

- Candidates adopt *binding* policy platforms x_L and x_R.
- In choosing their platform, consider
  - Own utility from that policy
  - Probability of winning in order to implement it

Example

- Distance preferences $u(x, i) = -|i - x|$
- *Uniform* distribution of voter ideal points on $[0, 1]$
- Candidate L's ideal point is $i_L = 0$
- Candidate R's ideal point is $i_R = 1$

Exercise (Now):

- Suppose candidate R chooses $x_R = \frac{3}{4}$
- What is candidate L's expected utility from choosing $x_L = \frac{1}{8}$?

Definition: An equilibrium is (x_L^*, x_R^*) such that x_L^* maximizes

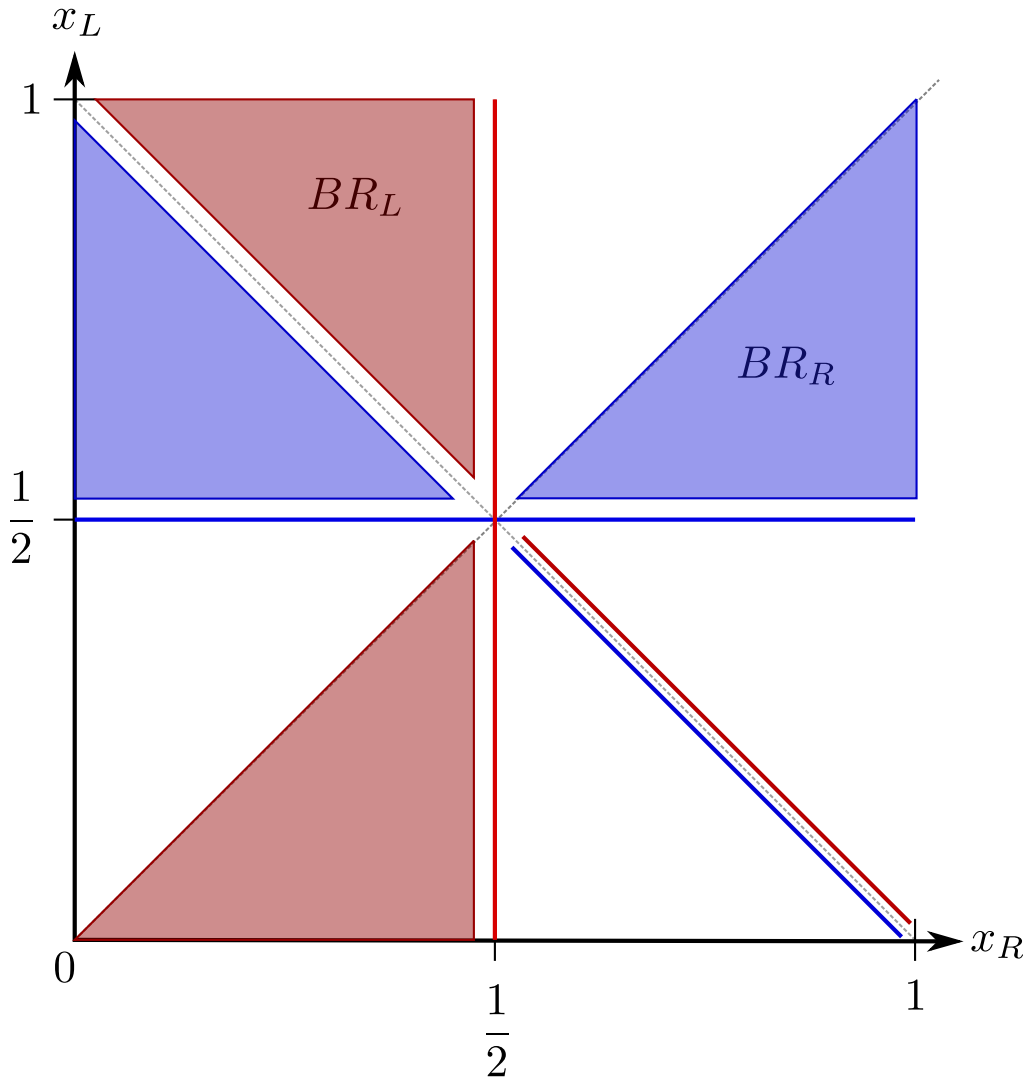
$$\pi(x_L, x_R^*) \cdot u(x_L, i_L) + (1 - \pi(x_L, x_R^*)) \cdot u(x_R^*, i_L),$$

and analogously for x_R^*, where $\pi(x_L, x_R)$ is the probability that L wins given platforms x_L and x_R.

Exercise (now):

- $i_L = 0, i_R = 1$, voter ideology uniform on $[0, 1]$
- Suppose $x_R \in (\frac{1}{2}, 1]$. What is Mr. L's *best response*? (Drawing a picture may help!)
- What if $x_R \in [0, \frac{1}{2})$?
- What about $x_R = \frac{1}{2}$?
- Draw a coordinate system with x_R on the horizontal and x_L on the vertical axis, each axis going from 0 to 1.
- Draw both candidates' **best response correspondences** and identify the unique equilibrium.

Best response correspondences



Proposition: With policy motivated candidates and commitment, (x_L^*, x_R^*) is an equilibrium iff $x_L^* = x_R^* = i_M$.

Proof:

- Suppose $x_L^* = i_M$. Then candidate R is indifferent between all platforms (since the result is always i_M.) Thus $x_R^* = i_M$ is *a* best response. Analogously for Mr. L. Thus this is an equilibrium.
- To see uniqueness, suppose that there is another equilibrium in which $x_L^* \neq i_M$.

  Then either **(i.)** $x_L^* < i_M$ or **(ii.)** $x_L^* > i_M$.

  (i.) **If (i.), candidate R's best responding implies that $x_R^* > i_M$ and R wins with certainty.** (His best response is to choose a policy to the right of i_M that is slightly closer to i_M.) So the policy outcome is $x_R^* > i_M$. **But then L would increase her utility by moving to i_M, winning, and implementing $i_M < x_R^*$.**

  (ii.) **In case (ii.), candidate R best responding implies that the winning policy is some $\bar{x} > i_M$ with certainty.** (If $x_L^* \leq i_R$, R must either choose the same platform or one that loses to L. In either case, the result is $\bar{x} = x_L^* > i_M$. If $x_L^* > i_R$, R must choose $x_R = i_R$ and win. The result is $\bar{x} = i_R > i_M$.) **But then L would increase her utility by moving to i_M, winning, and implementing $i_M < \bar{x}$.**

  Thus, we cannot have $x_L^* \neq i_M$ in equilibrium. An analogous argument can be used to show that $x_R^* \neq i_M$ is not possible.

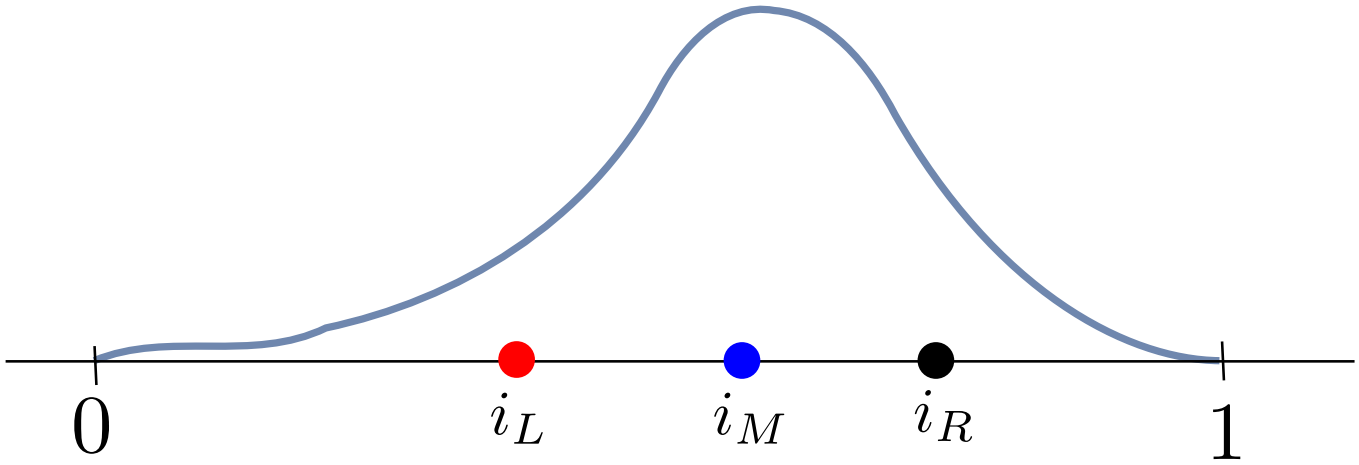
Interpretation: policy motivation + commitment

- In this case, electoral competition produces convergence to the median voter's preferred policy.
- This happens even if the candidates favor very extreme policies.
- The reason is that candidates compete in making concessions to the median voter.
- Similar to Bertrand price competition between firms (undercutting logic).

Prediction?

- Policy moderation should increase if politicians can *commit*.
  (Well, actually this follows after we've looked at the next case.)
- Think about factors that might make this more or less difficult!

Policy Motivated Candidates



No commitment to announced policy x_K

- Candidates cannot commit to implementing announced platform x_K.
- Voters anticipate that candidates will implement i_K if elected.
- Candidate who's *ideal point* is closest to median voter wins.

Interpretation: policy motivation + no commitment

- In this case, policy convergence is *excluded by assumption*.
- Polarization (e.g. in US politics) is 'explained' by non-median *candidate preferences*
- Begs the question: why don't *politicians with moderate preferences* run?
  - Alterts us to the process of *candidate selection*
  - In US: party primaries (essentially) open to all voters
  - In Germany: less public (party-internal) processes
- $\Rightarrow$ need to develop models that *endogenize* the set of candidates.

One such extension: Besley and Coate (1997) 'citizen candidates'.

- All citizens can *choose* to become a candidate.
- Running for office is *costly*.
- Equilibrium involves (some) polarization because the differences in their positions is what motivates candidates to run in the first place.
- Prediction: polarization increases with the cost of running for office.
  - I do not know whether this has been empirically tested.

Another modification: Voter abstention

- Suppose voters *abstain* if the candidates are either
  - too similar (indifference), or
  - too far away from their ideal point (alienation)
- Indifference: Voter i votes iff $|u(x_L, i) - u(x_R, i)| > \epsilon_i$
- Alienation: Voter i votes iff $u(x_K, i) > \delta_i$ for at least one $K \in \{L, R\}$
- ϵ_i, δ_i are voter-specific parameters drawn from a common distribution

Example - Abstention due to indifference

- Distance preferences $u(x, i) = -|i - x|$
- *Uniform* distribution of voter ideal points on $[0, 1]$
- Candidates are *office motivated*.
- Candidates can credibly *commit* to a policy platform
- Voter i votes iff $|u(x_L, i) - u(x_R, i)| > \epsilon_i$
- $\epsilon_i \sim U[0, 1]$

  $\Rightarrow$ voter i votes with probability $|u(x_L, i) - u(x_R, i)|$

Proposition: There exists a unique equilibrium, with $x_L^* = x_R^* = x_M$.

Proof: Exercise (see Problem Set)

Discussion: Two-party electoral competition in one dimension

- Policy convergence and moderation are robust to various modifications of the basic Downsian model.
- Convergence depends mainly on the assumption that candidates can *commit* to a policy platform.
- If candidates cannot commit, elections have a 'moderating' effect only in the sense that the candidate preferred by the median voter will win.
- Still, political polarization (e.g. in US politics) remains somewhat of a *puzzle* from this perspective!

Models that can explain polarization

- Grofman (1985) and Rabinowitz and Macdonald (1989) propose 'directional' theories of voting where voters support candidates who take *extreme* positions on the 'right side' of the issues they care about, causing candidates to take such positions.
- There are other explanations for polarization. This could be a good topic for a Bachelor Thesis.

Downsian Competition in multiple dimensions

- In two or more dimensions, **McKelvey's Theorem** (last lecture) implies that the Downsian model is unlikely to have an equilibrium. (Why?)

Instability

- Suppose that incumbent politicians are committed to their policy platform.
- Challengers should (almost) always be able to find a platform that defeats the incumbent.
- We would expect then that election cycles create a 'revolving door' with incumbents being defeated every time.

Gubernatorial elections in the U.S.

Time period	Fraction of changes in Party
1900-9	.143
1910-9	.315
1920-9	.211
1930-9	.320
1940-9	.243
1950-9	.236
1960-9	.372
1970-9	.391
1980-9	.325
1990-6	.379
1775-1996	.273

Q: Why so much stability? (Tullock 1981)

Probabilistic voting in multiple dimensions (Lindbeck and Weibull 1987)

- Instability is related to *discontinuity* in voter's choices:

  Small change in platforms $\Rightarrow$ reversal of electoral outcome.

- Randomness can "smooth out" these discontinuities.
- Probabilistic voting model: Voters is *more likely* to vote for the candidate he prefers, increasing with strength of preference.
- This model has an equilibrium even in multiple dimensions.

Probabilistic voting in multiple dimensions (Lindbeck and Weibull 1987)

- Voter i's utility: $U_i(x)$ for $x \in \mathbb{R}^n$
- Probability that i votes for candidate A:

$$\pi_i(x_A, x_B) = f_i\left(U_i(x_A) - U_i(x_B)\right)$$

- Candidates are assumed to maximize their *vote share*. E.g. candidate A maximizes (taking x_B as given)

$$\Pi_A(x_A, x_B) = \sum_i \pi_i(x_A, x_B)$$

Normative properties of probabilistic voting equilibria

- Suppose that the policy is to distribute an aggregate amount Y
- Mr. $i's$ utility from a distribution $\mathbf{y} = (y_1, ..., y_n)$ is $u(y_i)$
- He votes for A with probability $f_i\left(u_i(y_{Ai}) - u_i(y_{Bi})\right)$

Candidate A solves

$$\begin{array}{ll} \max\limits_{\mathbf{y}} & \sum_i f_i\left(u_i(y_i) - u_i(y_{Bi})\right) \\ s.t. & \sum_i y_i \leq Y \end{array}$$

Letting λ be the Lagrange multiplier on the constraint, the first order conditions require that for all i

$$f_i'\left(u_i(y_i) - u_i(y_{Bi})\right) \cdot u_i'(y_i) = \lambda$$

which can be written

$$u_i'(y_{Ai}) = \frac{\lambda}{f_i'\left(u_i^A - u_i^B\right)}$$

- Candidates equate *weighted* marginal utilities of income
  - The *smaller* is the RHS, the more money is transferred to Mr. i
- Weights reflect the voter's sensitivity to differences $(f_i'\left(u_i^A - u_i^B\right))$
  - The *larger* is f_i', the more money is transferred to Mr. i
- If $f_i'' < 0$ (diminishing sensitivity), put most weight on those who are indifferent.

Probabilistic voting: Main results (Lindbeck and Weibull 1987)

- If all voters are equally 'sensitive' ($f_i = f$ for all i), candidates converge on a platform that maximizes the utilitarian social welfare function.
- If sensitivities differ, candidates maximize a *weighted* utilitarian welfare.
- If f_i is increasing for all i, equilibrium platforms must lie inside the Pareto set.
- **Convergence:** If positions differ, there is an incentive to move towards one another to capture indifferent ('swing') voters

Criticism: 'Pseudo-rational' voting

- We argued at the beginning that *either*
  - citizens are behaving *irrationally* when they vote, or
  - they are voting for *non-instrumental* reasons
    (i.e. reasons not directly related to the outcome of the election.)
- Still, Rational Choice Theorists (usually) assume that voters
  - (accurately) evaluate the alternatives being presented, and
  - support the alternative that they would prefer being selected.
  - or even vote *"strategically"*
- Thus, although *participation* is non-instrumental or irrational, behavior 'in the voting booth' is assumed to be *instrumentally rational*.
- Voting is treated exactly like other kinds of choice: the individual evaluates the option and 'chooses' the one that offers her greater utility.

Objections to 'pseudo-rational' voting

- Rational Ignorance (Downs 1957)
  - Individual voter has no *instrumental* benefit from becoming informed about political alternatives.
  - Rational voters will remain uninformed (or badly informed).
  - This will be true unless the non-instrumental benefit of voting strongly depends on being well informed.
- Expressive voting (Brennan and Lomasky 1997)
  - Voters do not decide which option will be *chosen*. They decide which option to *support*.
  - People may enjoy *supporting* policies or candidates that they would not *choose* if it was up to them.
    - Attractive or charismatic personalities
    - Outrageous and entertaining candidates (examples?)
    - 'Morally' attractive policies (welfare programs, prohibition, ...)
  - The non-instrumental benefit from voting may actually be larger if I am *not* accurately informed.
    - Preference for superficial and ideologically biased news.
    - Reluctance to consider nuanced / complicated arguments.

References

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