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DO THE RIGHT THING. MIXED MOTIVES AND THE CONDORCET JURY THEOREM

Two Classic Questions

- Why Do People Vote in Large Elections?
- Are Elections a Good Way to Make Decisions?

- This paper:

  How does a realistic answer to first question affect the answer to the second?

Why do People Vote?

- To affect outcome of elections:

  Instrumental Motives
- But… little chance of being decisive in large election. (Downs ‘57)
- Hence, little reason to vote
- Yet lots of people do vote…

Why do People Vote, Part 2

- Intrinsic reward to casting vote:

  Expressive Motives
  - Riker-Ordeshook's (1968) '*D*' (duty).
  - But…most people also feel strongly about *how* they vote.
    - just show up & 'donkey vote' does not do! (Brennan-Buchanan, 1984)

→ Intrinsic reward from voting as it expresses identity, norms, party affiliation, etc.

Are Elections Good Way to Make Decisions?

- Yes
  - Condorcet (1785)
- Maybe
  - Condition on being decisive → Sincere voting not always equilibrium
    - Austen-Smith and Banks (1996)
- Absolutely!
  - Strategic voting no problem
    - Feddersen and Pesendorfer (1997, 1998)

Combining the Two Questions

- If voters have purely instrumental preferences
  - Elections work well if lots of voters show up
  - But no reason for lots of voters to show up
- If voters also have expressive preferences
  - Lots of people show up
  - But… do elections work?

Key Question:

- How well do elections work when voters have both instrumental and expressive preferences?

Trivial Answers

- If expression is merely duty to show up
  - Obvious that elections work well
- If expression also depends on vote cast, but is *always* aligned with information
  - Obvious that elections work well

- What if, sometimes, *conflicted* between expressive preference and info?

United Auto Workers

- UAW is voting whether to strike.
  - You have info suggesting strike will be unsuccessful
- But what about…
  - Co-workers
  - Father
  - Principles
- You are conflicted!

What to do?

- In small election
  - Stakes are high
  - You might be decisive

  →Vote with your head (i.e., instrumentally)

- But the UAW is large
  - Stakes are high
  - But you are unlikely to be decisive
  - Vote with your heart (i.e., expressively)

Are Elections Good Way to Make Decisions?

- Depends on:
  - Quality of information
  - Size of the electorate
  - Likelihood of conflict between the head and the heart

Preview: Two Lessons

- Even a little expressiveness is a lot different from no expressiveness
- More is not better:
  - Always a “Valley of Death”
  - Beware of the Cliff

Model

- Simplest model we could think of to highlight role of expressive preferences.
- Simple-majority election
- Two states, α and β, equally likely
- Two possible election outcomes *A* and *B*
  - Outcome *A* is best in α
  - Outcome *B* is best in β
- Two signals, *a* and *b*
  - Probability of correct signal is $r > \frac{1}{2}$
- n +1 voters; n is even.

Preferences

- Instrumental
  - Everyone gains 1 util (x instrumental weight) if the “right” outcome is chosen
- Expressive
  - Gain 1 util (x expressive weight) if vote according to norm
  - Prior norms: Prob. $\rho \geq ½$, a voter’s norm is *A*
  - Malleability: Prob. *q*, norm adjusts (if needed) to be consistent with signal
- Weights
  - ε on expressive, $1 - \varepsilon$ on instrumental

Inner Conflict

- Two kinds of voters:
  - Unconflicted
    - Expressive norm and signal coincide

    → Simply vote according to their type/signal
  - Conflicted
    - *A* types: *A* as expressive norm and signal *b*
    - *B* types: *B* as expressive norm and signal *a*

→ All action comes from conflicted types

Boring Benchmark

- If $\varepsilon = 0$, everyone votes according to signal
  - Information fully aggregates in limit
  - More is better

  → Elections perform extremely well

- We study $\varepsilon > 0$.
  - (If uncomfortable with this, think of ε as really small. Say, 1/1000.)

Pure Strategy Equilibria

- Benefit of voting instrumentally
  - (1 – ε) { Pr [tie & correct] – Pr [tie & wrong] }
- Cost if conflicted = ε
- If $n < n_I$ then instrumental voting is an equilibrium
- If $n > n_E$ then expressive voting is an equilibrium.
- Key point: Same voter votes differently in small v large elections

Instrumental v Expressive Voting

- How does n_I compare to n_E ?

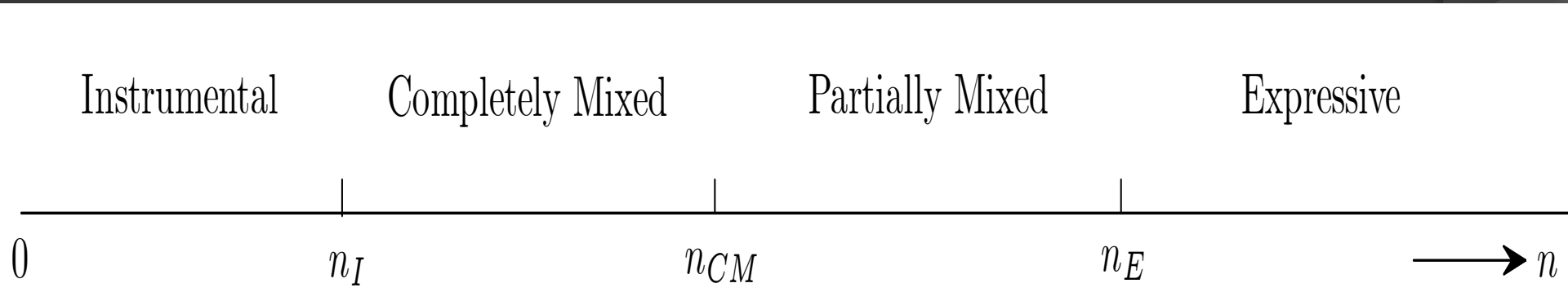
  Typically there is a gap between the two:
  - Example: $r = 3/5$, $\rho = q = ¾$, $\varepsilon = 1/1000$
    - $n_I = 128$
    - $n_E = 5{,}862$
- What happens in between?

The Gap

- Distinguish between:
  - High correlation: $q > q^*$
    - Norms more malleable, i.e., affected by “facts”
  - Low correlation: $q < q^*$
    - Norms less malleable; facts less likely to overturn them
- High correlation better behaved than low correlation.
  - Study high correlation first

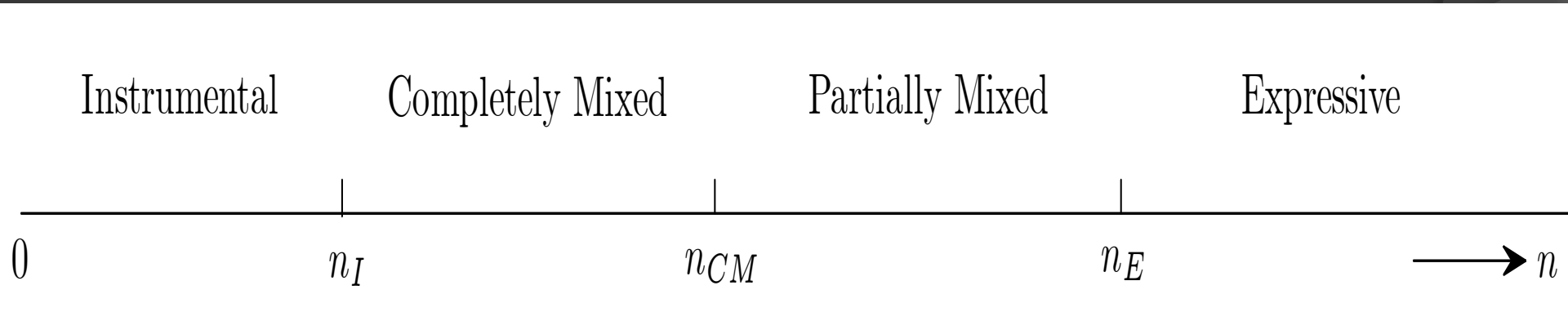
Filling the Gap – High Correlation

- Instrumental: $n \leq n_I$
- Completely mixed: $n_I < n \leq n_{CM}$
  - Conflicted voters mix between instrumental and expressive
- Partially mixed: $n_{CM} < n < n_E$
  - *B* types vote expressively, *A* types still mix
- Expressive: $n \geq n_E$



Example – High Correlation

- $r = 3/5$, $\rho = q = ¾$, $\varepsilon = 1/1000$
  - $n_I = 128$,
  - $n_{CM} = 162$,
  - $n_E = 5{,}862$

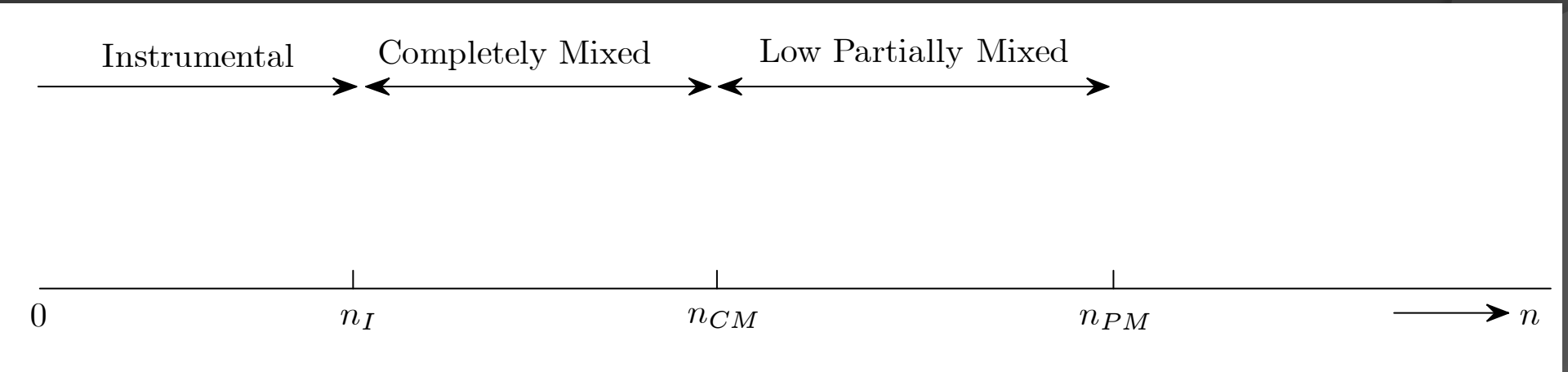


Results – High Correlation

- For every *n* there is a unique equilibrium
- Equilibrium moves smoothly from instrumental to expressive as *n* increases.

Filling the Gap – Low Correlation

- Equilibrium regions overlap
  - E.g., Expressive & instrumental can coexist
- *Two* types of partially mixed equilibria
  - Start at n_{CM} and n_E, resp., converge and disappear at n_{PM}



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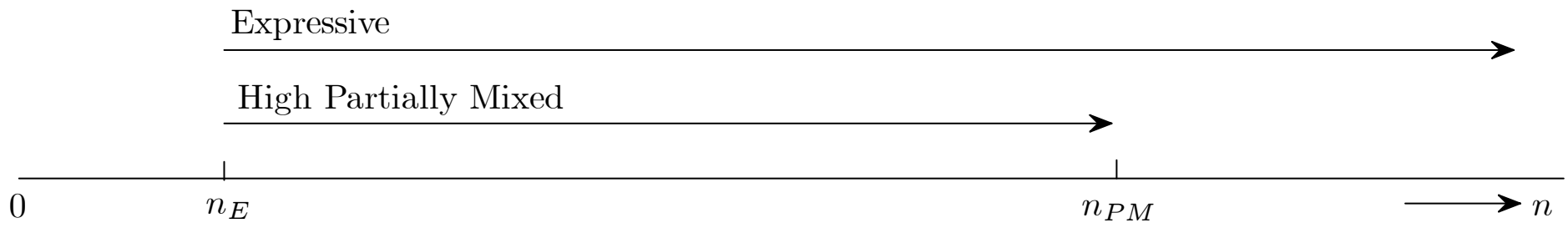

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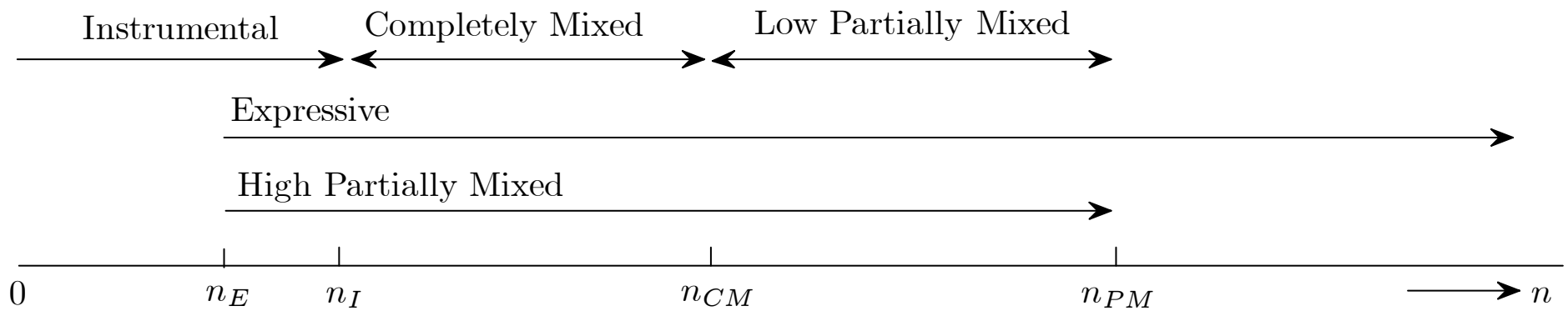
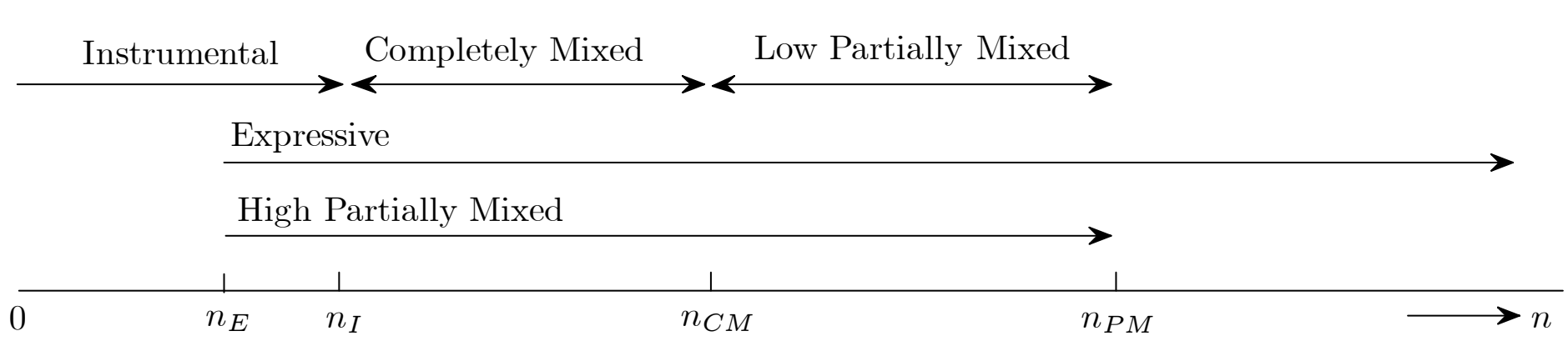
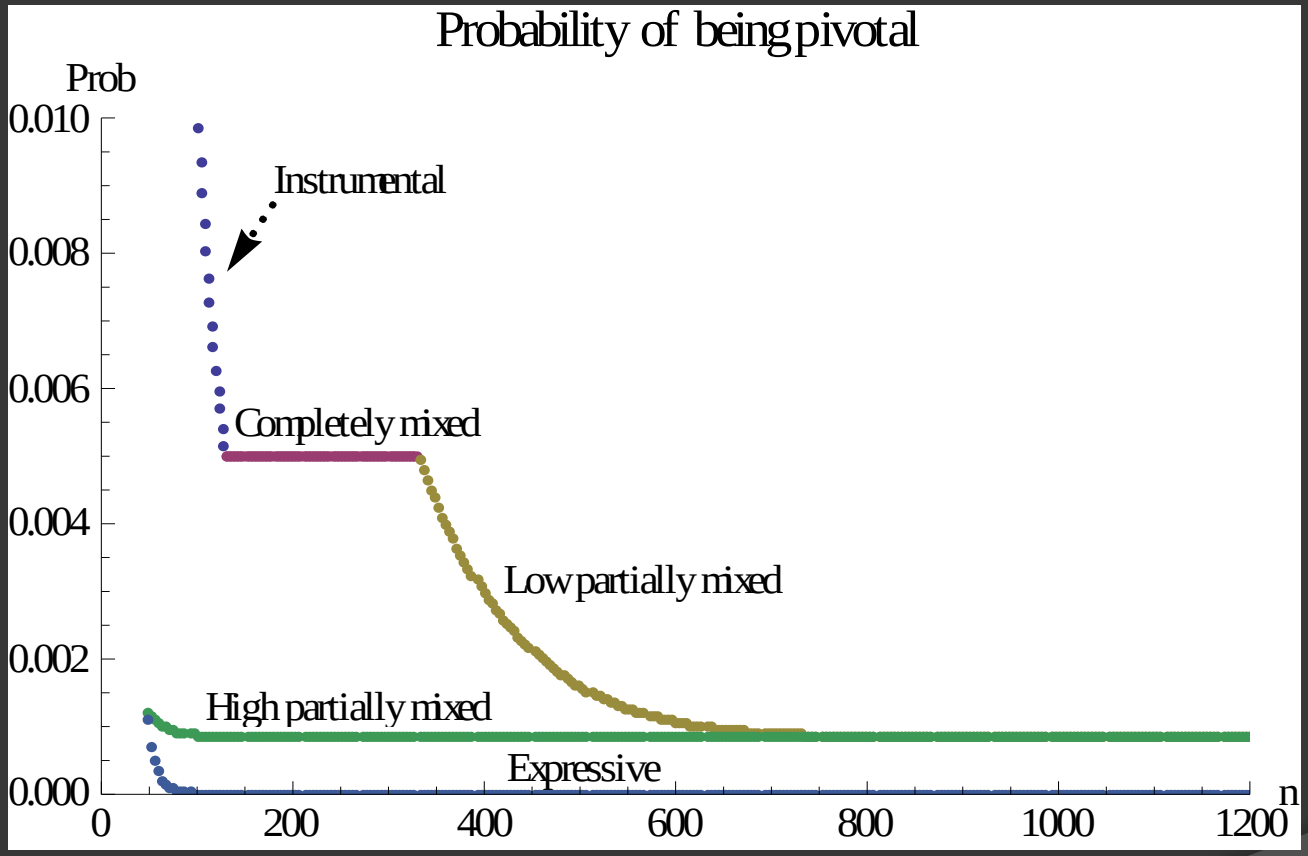


Example – Low Correlation

- $r = 3/5$, $\rho = ¾$, $q = 1/7$, $\varepsilon = 1/1000$
  - $n_I = 128$
  - $n_{CM} = 330$
  - $n_{PM} = 228{,}724$
  - $n_E = 48$



Example– Pivotality



- At n_{PM} , Pr[Piv] = 0.08%; 10^{2027} > than when $\varepsilon = 0$

Results – Low Correlation

- Multiple equilibria for some *n*
- The “best” equilibrium becomes more expressive as *n* increases, and falls off a cliff at n_{PM}.

Performance of Elections

Two different criteria:

- Selection accuracy, *S*
  - Prob. of electing the “right” candidate
- Welfare, *W*
  - per capita expected utility

Ranking Multiple Equilibria

- Accuracy:
  - For fixed *n*, coexisting equilibria can be ranked in terms of selection accuracy:

$$S \in \{S_I, S_{CM}, S_{LPM}\} > S_{HPM} > S_E$$

Welfare

- Multiple equilibria:
  - Welfare ranking is same as accuracy ranking:

$$W \in \{W_I, W_{CM}, W_{LPM}\} > W_{HPM} > W_E$$

- Change in *n* increases welfare *W* iff it increases accuracy *S*

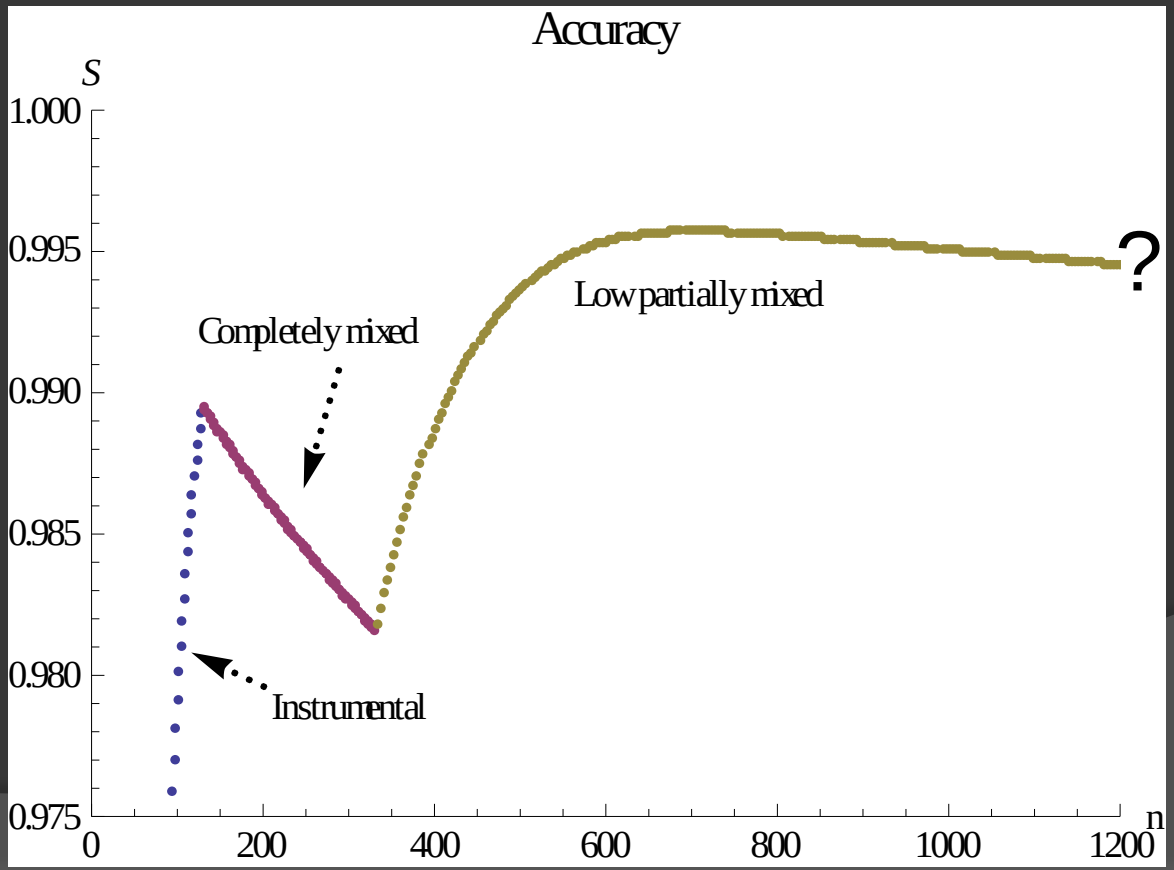
→ Hence, focus on accuracy

Optimal Size of Electorate

- Are more voters better for accuracy?
  - When $\varepsilon = 0$, trivial: More is better.
  - When $\varepsilon > 0$, trade-off:
    - More voters → more information
    - More voters → more expressive voting

Optimal Size of Electorate–Part 2

- Trade-off not trivial
- What happens when *n* gets large?



Asymptotics

- Large elections fully aggregate information if and only if correlation is very high (i.e., $q > q_1 > q^*$).

- Otherwise, large elections no better than coin flip at selecting correct outcome

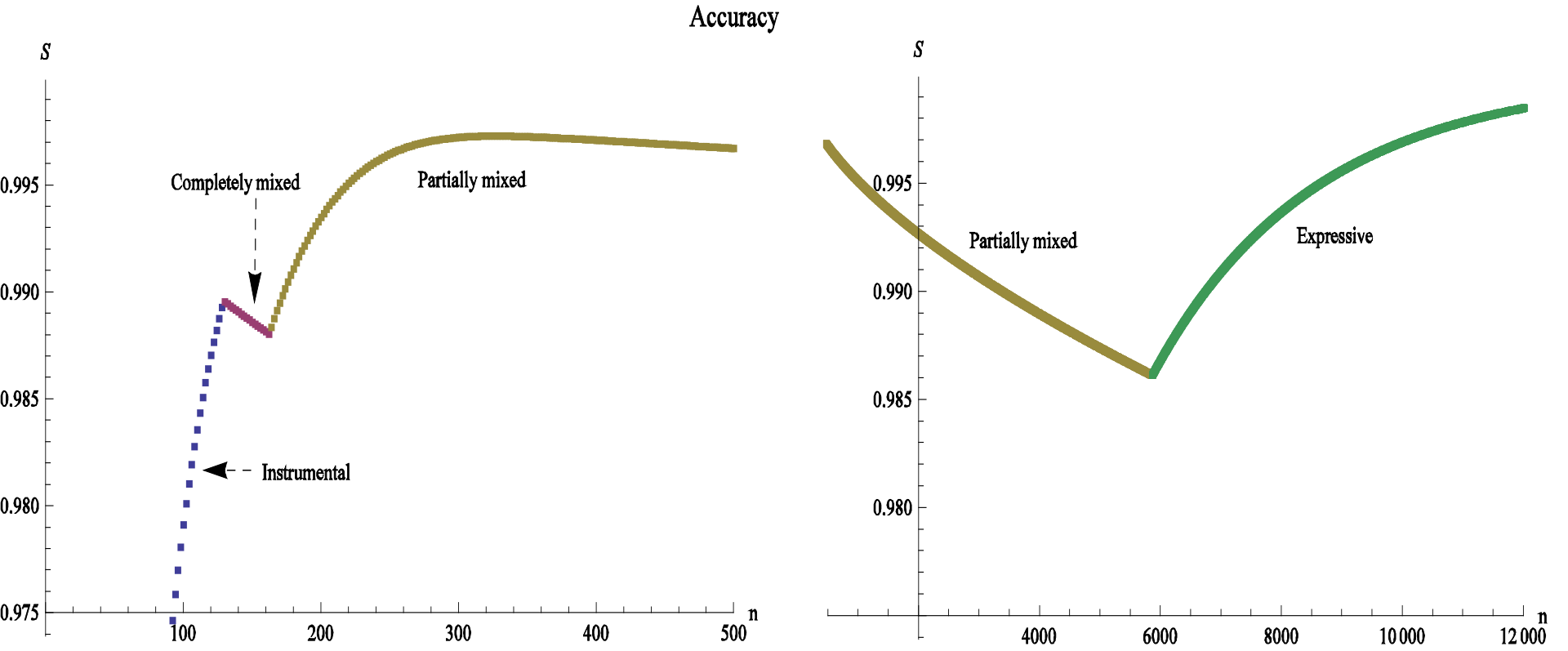
Finite *n* – Very High Correlation

- *S* always rises in *I* region
- *S* always falls in *CM* region*
- Hump-shaped in *PM* region*
- *S* always rises in *E* region

→ Expanding size of electoral body may be bad idea, even under high correlation.

Example – Very High Correlation

- "Valley of Death," even if $q > q_1$
  - $r = 3/5$, $\rho = q = ¾$, $\varepsilon = 1/1000$
  - At $n = 10{,}366$, S reaches old max of $n = 326$



Finite *n* – Low Correlation

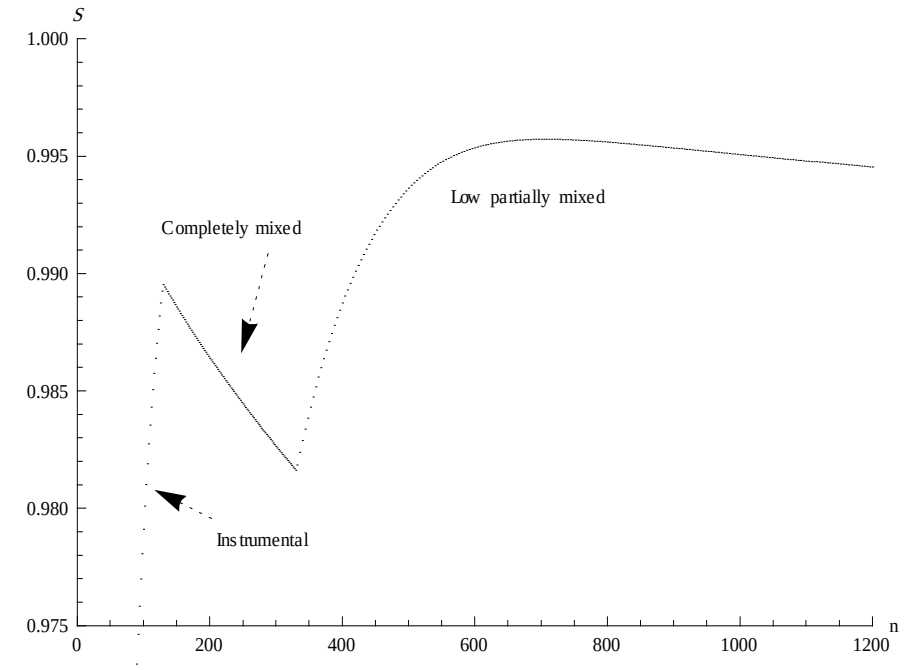
- *S* always rises in *I* region
- *S* always falls in *CM* region*
- Hump-shaped in *LPM* region*
- *S* always rises in *HPM* region
- *S* hump-shaped in *E* region

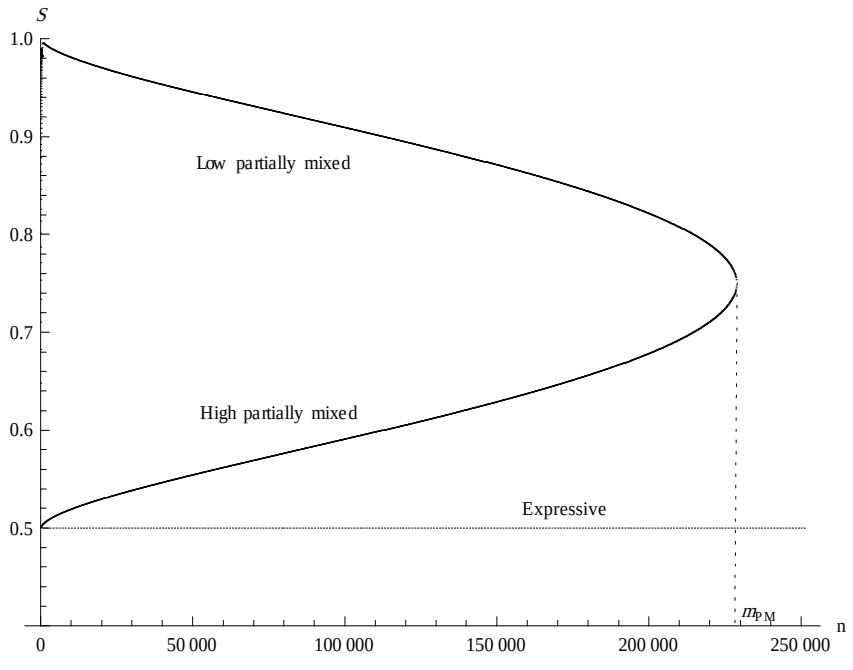
Example – Low Correlation

- Cliff at n_{PM}
  - $r = 3/5$, $\rho = ¾$, $q = 1/7$, $\varepsilon = 1/1000$

    At n_{PM} = 228,724, S drops from 3/4 to 1/2

Accuracy





Two Lessons

- Even a little expressiveness is a lot different from no expressiveness
  - Equilibria
  - Info aggregation
- More is not better
  - Always a “Valley of Death”
  - Beware of the Cliff

Recent UK election...

- After Reform Act of 1832:
  - 720,000 voters chose 658 MPs:
    1100 voters per MP
- Today:
  - 45,000,000 voters choose 650 MPs:
    69,000 voters per MP
- Over the cliff?
- In any case, voters can indulge their expressive preferences more than before

S – Very High Correlation, $\rho = ½$

- *Valley of Death*, even if $q > q_1$ & $\rho = ½$
  - $r = 3/5$, $\rho = 1/2$, $q = ¾$, $\varepsilon = 1/1000$: Only at $n = 6{,}472$, S reaches old max of $n = 128$