Transparency, automated redistricting, and partisan strategic interaction in Mexico

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Motivation

Redistricting by independent commission

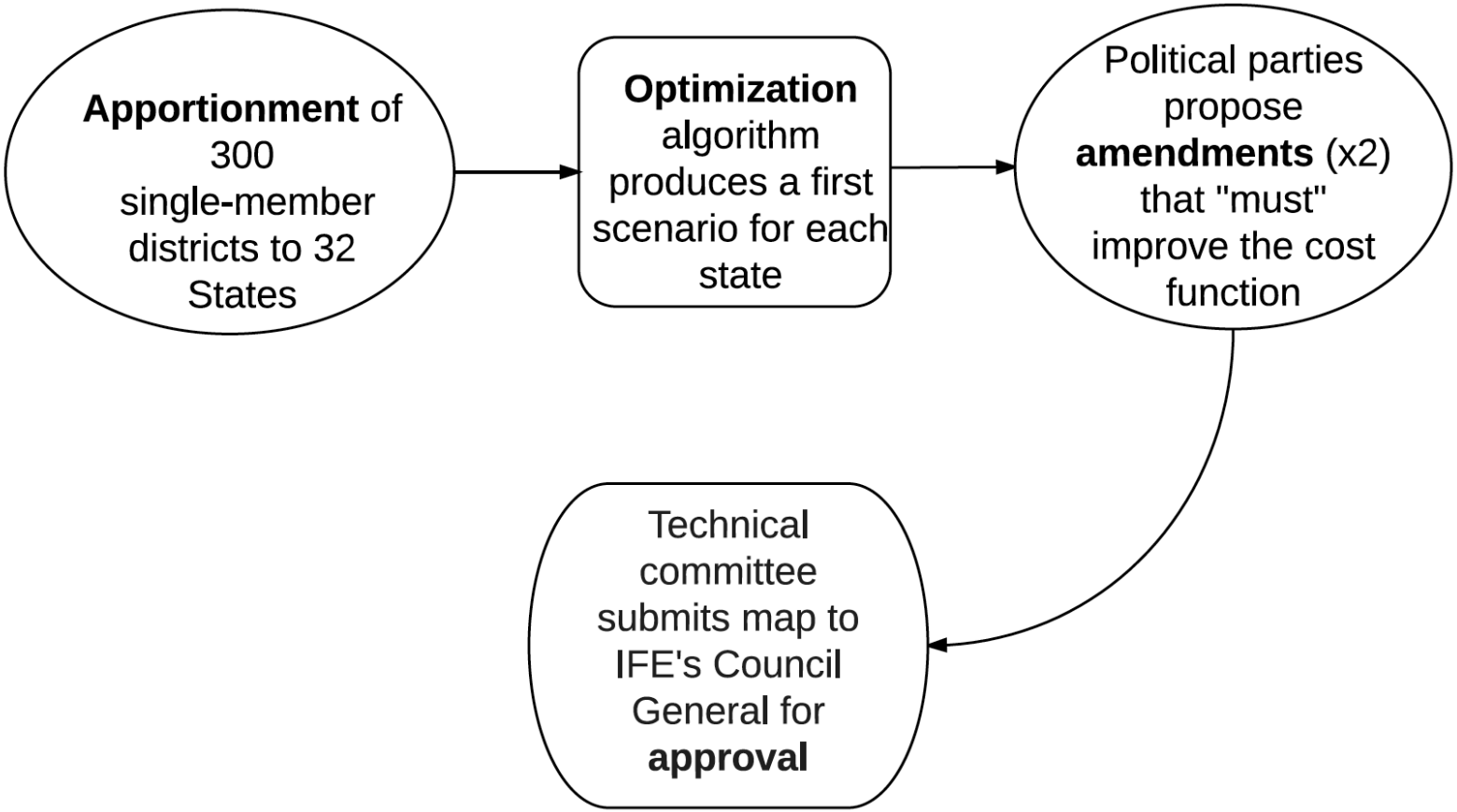
1. Does taking map drawing out of politicians' hands ensure a fair result?
2. Can parties influence district boundaries? How?
3. How can the redistricting process be made more transparent?

Paper inspects the case of Mexico since 1997

Background on Mexico

- 32 states, 2.5k municipalities, 67k electoral *secciones*
- Hegemonic party 1929–2000
- Lower chamber of Congress elected every 3 years
  - SMD only until 1961
  - Mixed system since 1979: 300 SMD + 200 PR seats
- Single-term limits removed in 2018
- Independent board (IFE) organizes elections and redistricting

The redistricting process



Apportionment

Hamilton method used:

- The quota (or price of a seat) is $Q = \frac{\text{nation's population}}{300}$
- First allocation is $\frac{\text{state's population}}{Q}$, rounded down
- Every state gets 2 seats min
- Unallocated seats, if any, awarded to states with largest fractional remainders

Most recent decennial census must be used

- ... but no obligation to redistrict as soon as available
- 6-year lag on average: 199**7**, 200**6**, 201**5**

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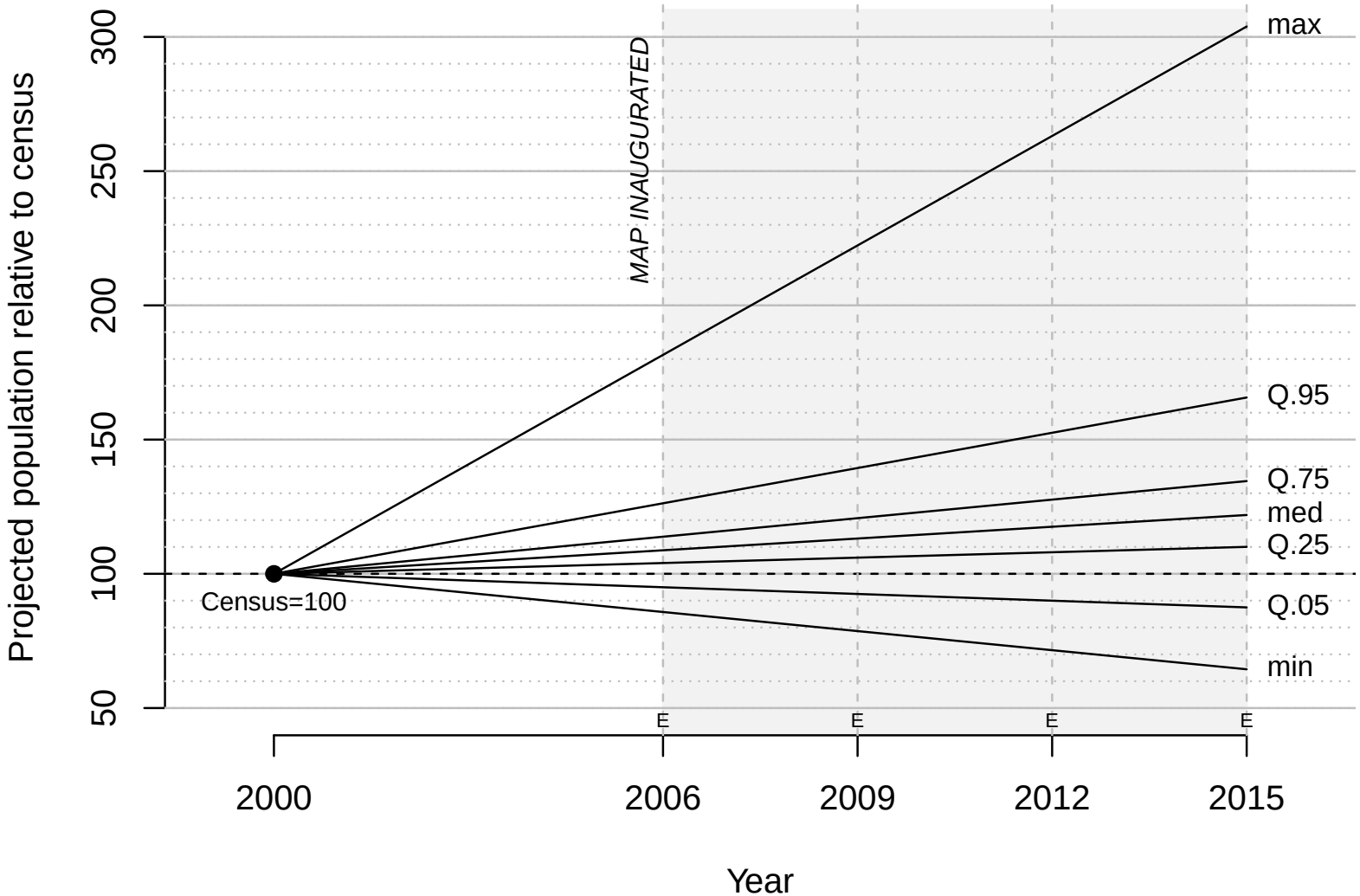
District populations: linear projection

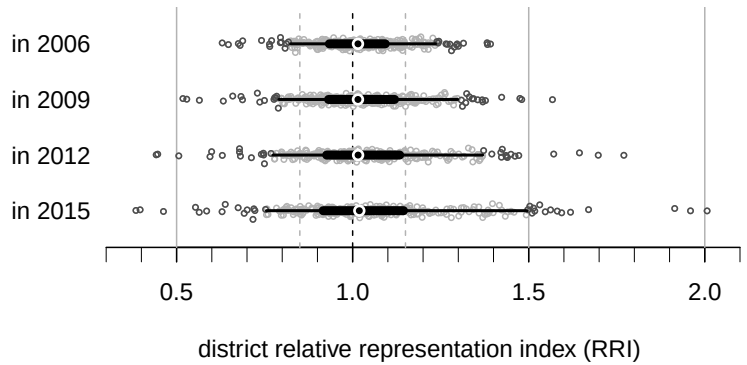


Plus: bureaucratic leeway in new district sizes

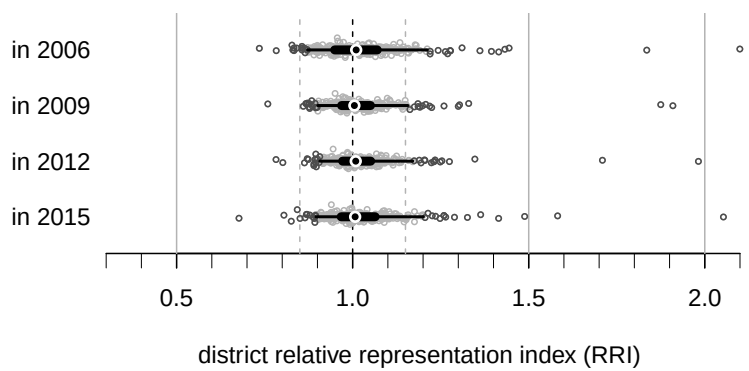
Malapportionment is substantial

$$RRI = \frac{nat.pop./300}{\text{district size}}$$

2006 map (drawn with 2000 census)



2015 map (drawn with 2010 census)



Automated redistricting

Redistricting by experts since 1997

1. no district crosses state boundaries
2. optimization algorithm $\rightarrow$ proposal
3. parties propose amendments ("must" improve score)
4. repeat 2 and 3 once
5. board approves new map

$$\texttt{Score} = .4 \times \texttt{PopBalance} + .3 \times \texttt{MunicBoundaries} + .2 \times \texttt{TravelTime} + .1 \times \texttt{Compactness}$$

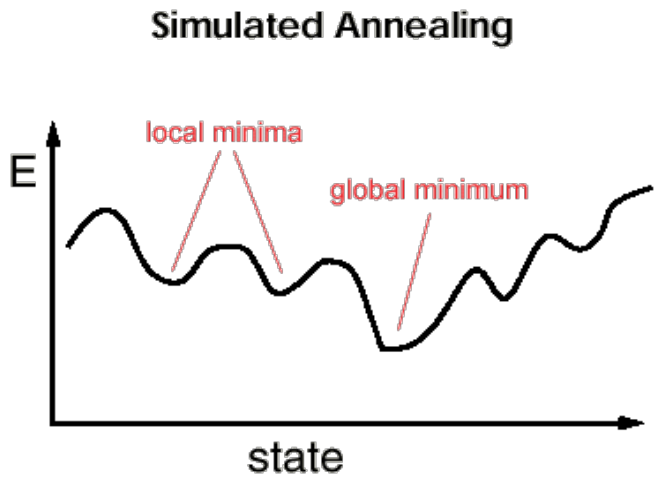
$\pm 15\,\%$ imbalance considered legal (!)

Optimization algorithm

Simulated annealing = probabilistic meta-heuristic for optimization locates a good approximation to the global optimum of the cost function in a large search space

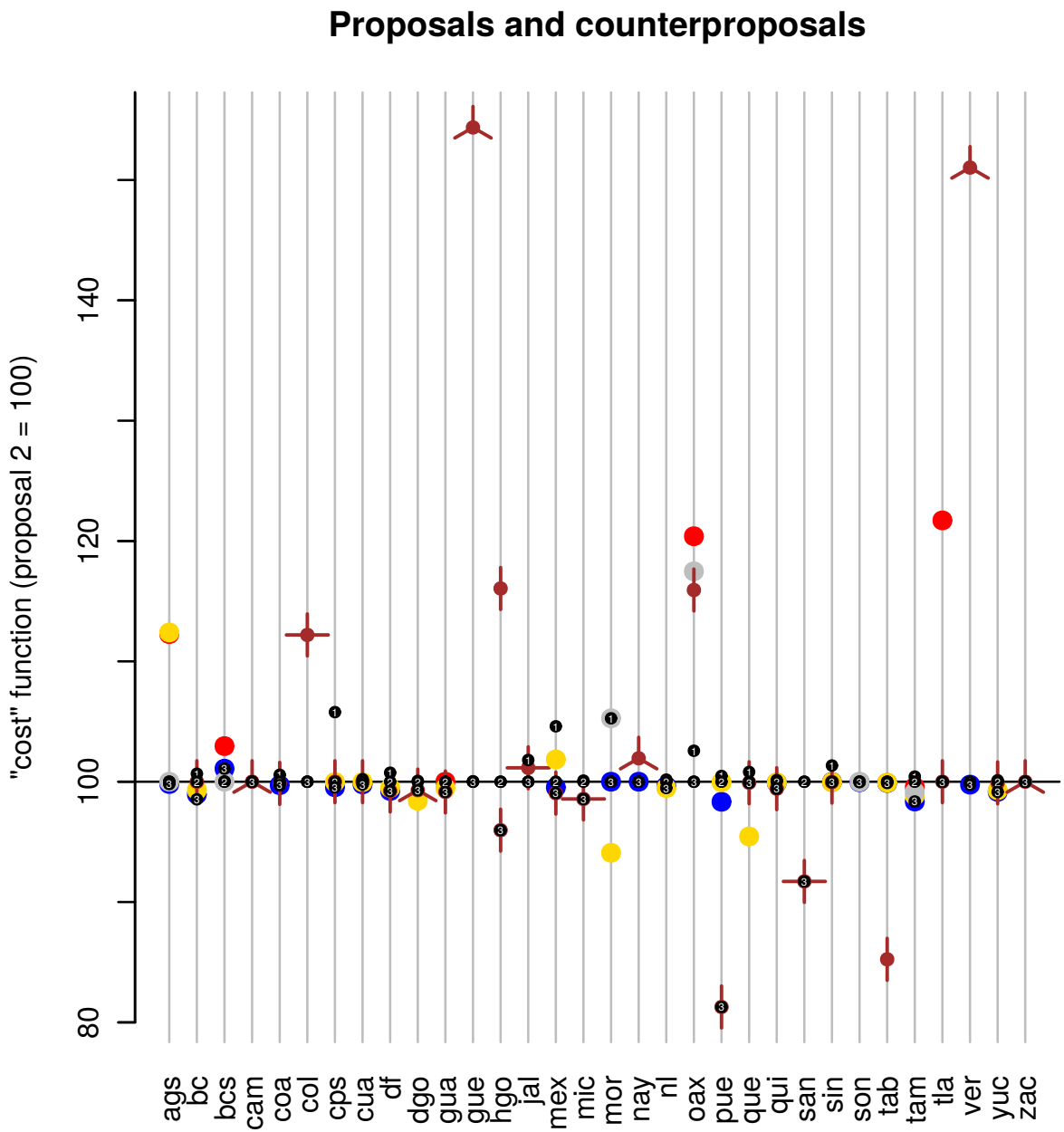
Thousands of iterations using electoral *secciones*

Combinatorial optimization algorithm used to generate the first scenario in each state



Board claims that this is a public process, but the operation and procedures are done behind closed doors

Party amendments



Party amendments

- Humans can beat the computer $\rightarrow$ enables manipulation
- Smoking gun: four maps improved score but not adopted
- Unobserved: maps improving score but hurting parties?
- Increased similarity of final map to status quo: parties protecting strongholds?
- Asymmetric party capacity to produce counterproposals: by far, PAN most effective. Benefits?
- Party learning process

Parties protect strongholds?

District similarity index (Cox&Katz 2002) = share common population

Similarity between	min	25 %	median	75 %	max
initial 2015 proposal and status quo	0.128	0.419	0.584	0.755	1
final 2015 proposal and status quo	0.125	0.437	0.643	0.805	1
final and initial 2015 proposals	0.174	0.705	0.967	1	1

The bigger project

Draw Mexico project = offspring of *Public Mapping Project in U.S.*

Remove opaqueness from redistricting process

`DistrictBuilder` is open-source, web-based software

- enables widespread DIY redistricting thru cloud computing
- internet lets anyone draw/inspect maps: crowdsourcing
- redistricting contests in 6 US states $\rightarrow$ hundreds of legal plans

Application to Mexico ▸ Link: MexDemo (Donations anyone?)

Wrap-up

- Transparency in commission's work is a must for accountability
- Mexico case study:
  1. Explicit rules violated
  2. Ad-hoc operationalization
  3. Parties acting as if implicit rules operational
- None can be assessed from publicly available information

Thank you!

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