

Malapportionment and representation

Party bias and responsiveness in Mexico

E. Magar¹ M. Altman² M.P. McDonald³ A. Trelles⁴

¹ITAM

²MIT

³UF, Gainesville

⁴University of Pittsburgh

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How does malapportionment distort representation?

Studies of U.S. and U.K.

- instills bias when one party strong in small districts (as Tories were up to 1997, Johnston 2002)
- Reapportionment Revolution removed bias in different, predictable degrees (Cox&Katz 2002)
- no pro-Dem bias from malapp. after mid-1960s (Grofman et al. 1997)

How does Mexico fare?

- ① malapportionment? Substantial
- ② Party bias? Not much, but big large-party bonus

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Mexican congressional districts

Redistricting in 1997, 2006, and 2015 (abandoned)

Redistricting process (FPTP):

- ① apportionment of 300 seats to 32 states
- ② optimization algorithm \rightarrow proposal
- ③ parties propose amendments (must improve score)
- ④ repeat 2 and 3
- ⑤ new map

Redistricting by experts, but behind closed doors

$$\begin{aligned}\text{Score} = & .4 \times \text{PopBalance} + .3 \times \text{MunicBoundaries} \\ & + .2 \times \text{TravelTime} + .1 \times \text{Compactness} \quad (1)\end{aligned}$$

Topic will be salient when single-term limits dropped in 2015

The bigger project

Drawing Electoral Boundaries in Mexico = offspring of
Public Mapping Project in U.S. (Altman&McDonald)

DistrictBuilder is software (open-source)

- enables widespread DIY redistricting thru cloud computing
- anyone w/internet can draw/inspect maps: crowdsourcing
- redistricting contests in 6 states → hundreds of legal plans

Remove opaqueness from redistricting process

Application to **Mexico** [▶ Link: MexDemo](#) (Donations?)

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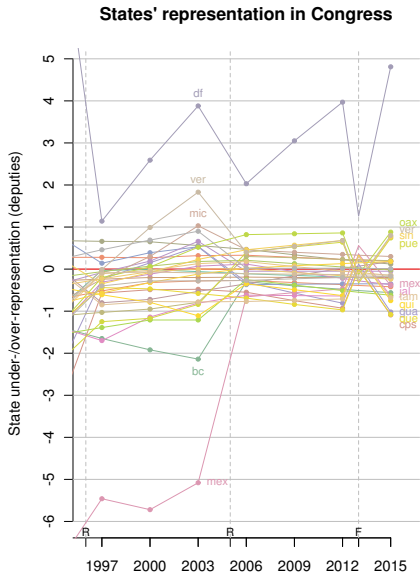
Hamilton method used:

- 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 minimum.
- Unallocated seats, if any, awarded to states with largest fractional remainders

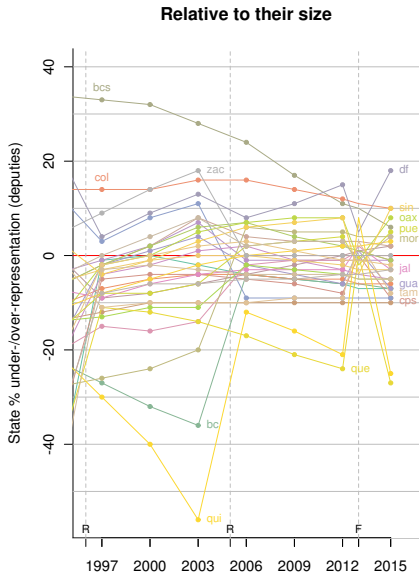
Most recent decennial census must be used

- ... but no obligation to redistrict as soon as available
- 6-year lag on average: 1997, 2006, 2015
- and IFE considers $\pm 15\%$ imbalance normal (!)

Malapportionment between states

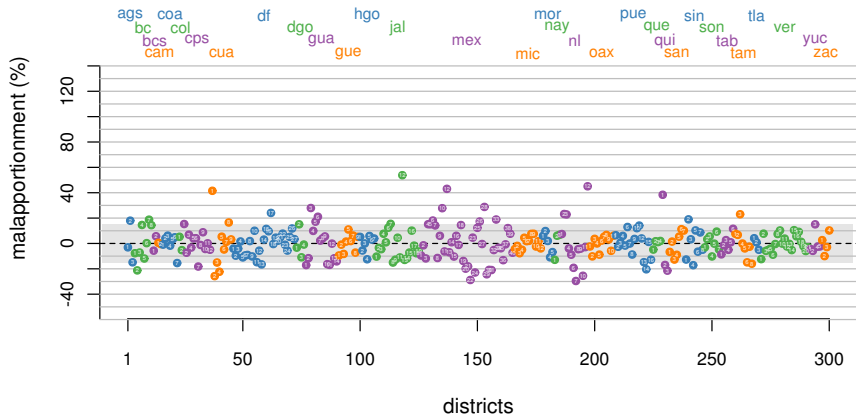


Malapportionment between states



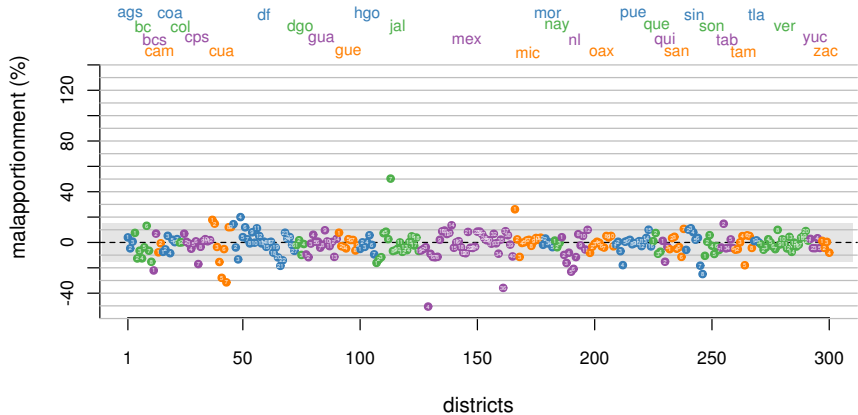
Malapportionment within states

2006 map when inaugurated



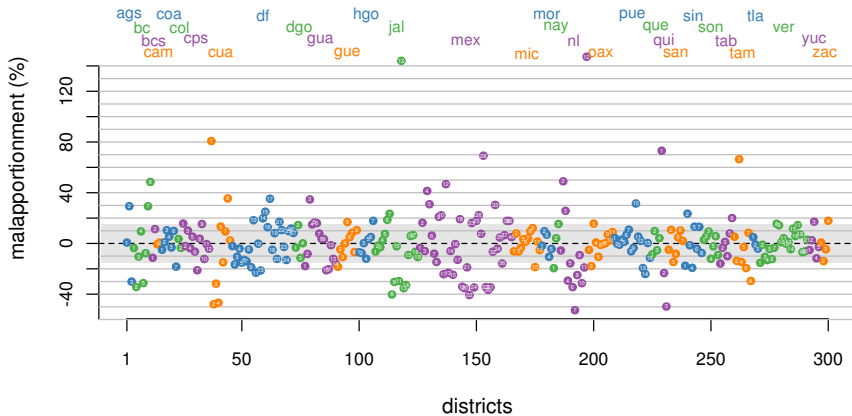
Malapportionment within states

2015 map had it been inaugurated



Malapportionment within states

2006 map in year 2015



Two types of distortion

Focus in the **votes-to-seats** relation

(Rae 1967, Tufte 1973, Lijphart 1994, Taagepera&Shugart 1989)

Two measures of interest:

① **Party bias** λ :

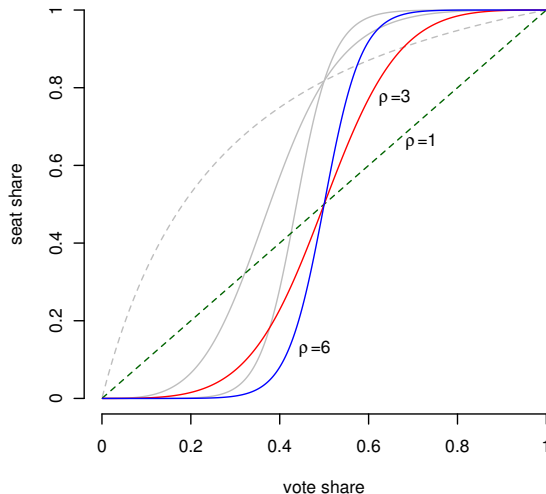
helps beneficiary buy seats with fewer votes
("packing")

② **Responsiveness** ρ :

seat bonus to large parties
("microcosm strategy")

Two types of distortion

District responsiveness ρ (and party bias $\lambda > 0$ in grey)



Cube Law:

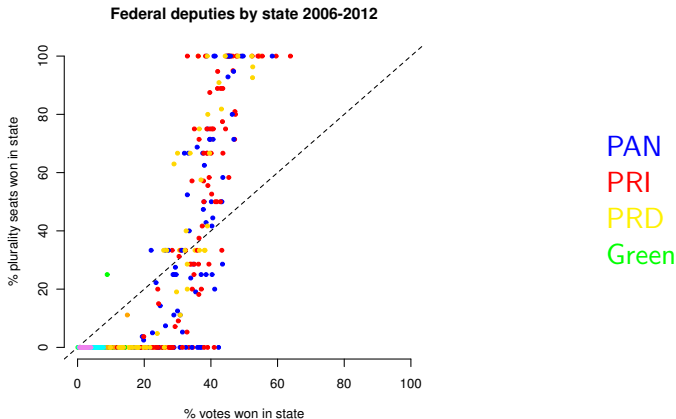
$$\frac{s}{1-s} = \left(\frac{v}{1-v} \right)^3$$

Generalization (King&Browning 1987):

$$\frac{s}{1-s} = e^{\lambda} * \left(\frac{v}{1-v} \right)^{\rho}$$

Multiparty (King 1990):

$$E(s_j) = \frac{e^{\lambda_j} * v_j^{\rho}}{\sum_{m=1}^J e^{\lambda_m} * v_m^{\rho}}$$



- State-level aggregates (average = 9.4 districts, but $\Delta^+ N$)
- 2006–2012 districts constant
- MCMC

Presumption

- PRI has strong bases of support in rural districts
- rural districts under-populated
- State-years above 45° line (2006–12):

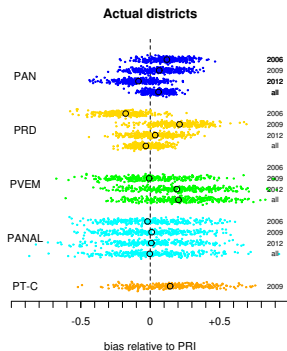
PRI	$\frac{3}{5}$
PAN	$\frac{2}{5}$
PRD	$\frac{1}{4}$

Johnston hypothesis:

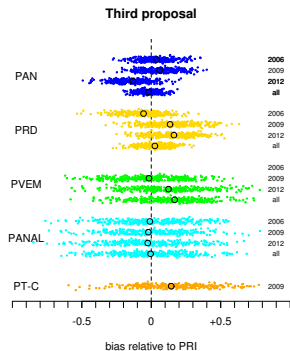
Might malapportionment → bias in favor of PRI?
Against PAN?

Results: party bias

2006 map

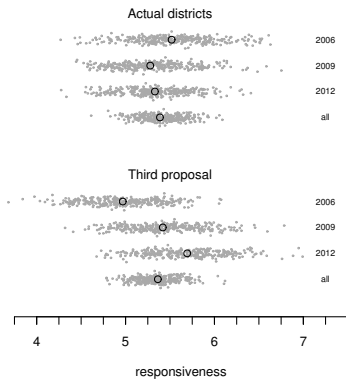


2015 map



Results: responsiveness

District responsiveness in three elections



Preliminary analysis reveals that:

- ① Substantial malapportionment
- ② No evidence of systematic party bias
- ③ Huge large-party bonus (PRI is small in few states)
- ④ Are effects of malapp. eclipsed by inter-election volatility?
- ⑤ Study residuals from estimation: relation to malapp.? turnout diff.? geography of support?

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