Quasi-experiments: Introduction and Applications on Effects of Political Representation

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Why quasi-experiments

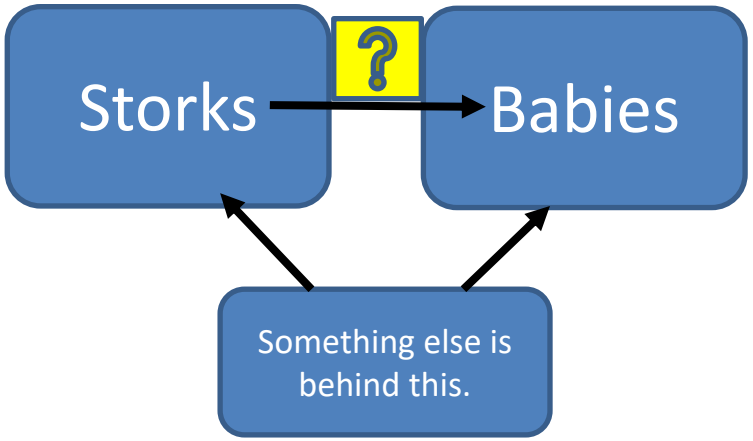
- While RCT are the golden standard, sometimes they are not feasible due to ethical, legal, financial or practical reasons
- Causal inference may still be possible by using experiments that the nature provides
- In quasi-experiments (a.k.a natural experiments), researcher is not active manipulator of the DGP
- For example, public policies, different laws, geography, weather, accidents can sometimes be as-good-as-random from the perspective of the research question

Why quasi-experiments

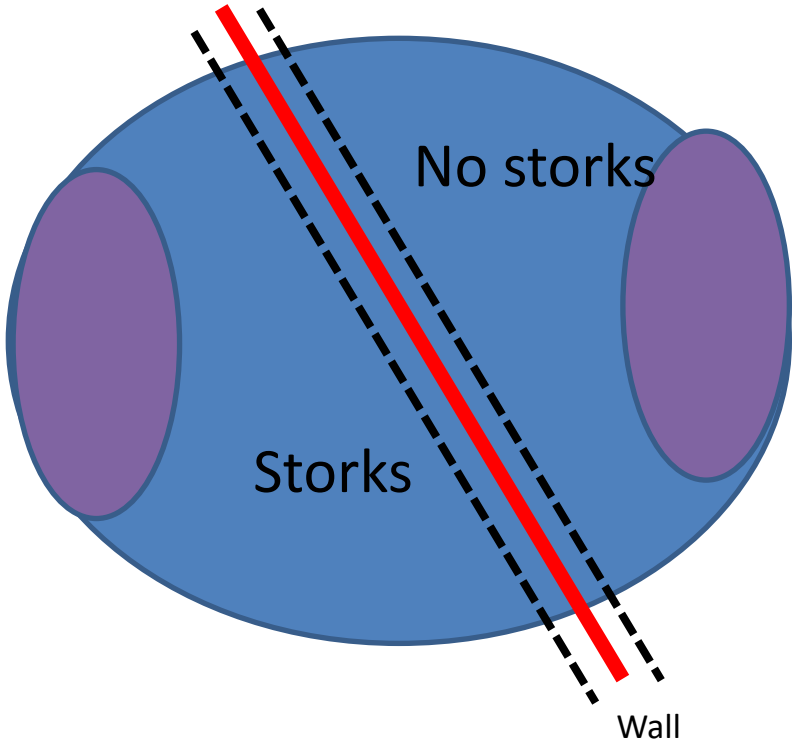
- Pros
  - Quasi-experiments are conducted in real environment with real economic agents who do not consider being in an experiment, and thus, do not suffer from behavioral biases that some human subject lab experiments may do
  - (More) immune to data manipulation by the researcher than RCTs
  - Often large-n data is available cheaply (e.g. register data at Statistics Finland), the real input is creativity of the scientist in finding the source of plausibly as-good-as-random variation for interesting questions
  - In the case of spillovers/externalities, may be better than RCTs in identifying population wide (general equilibrium)effects
- Cons
  - Can only ask questions for which there is a natural experiment
  - Internal validity depends on how clean the natural experiment is. There are numerous published papers out there where research design does not seem to be very clean
  - Possibilities for meta-analysis may be very limited, e.g., how to get Finnish policy maker introduce an identical tax policy change as your Swedish data has

So, what are the main methods?

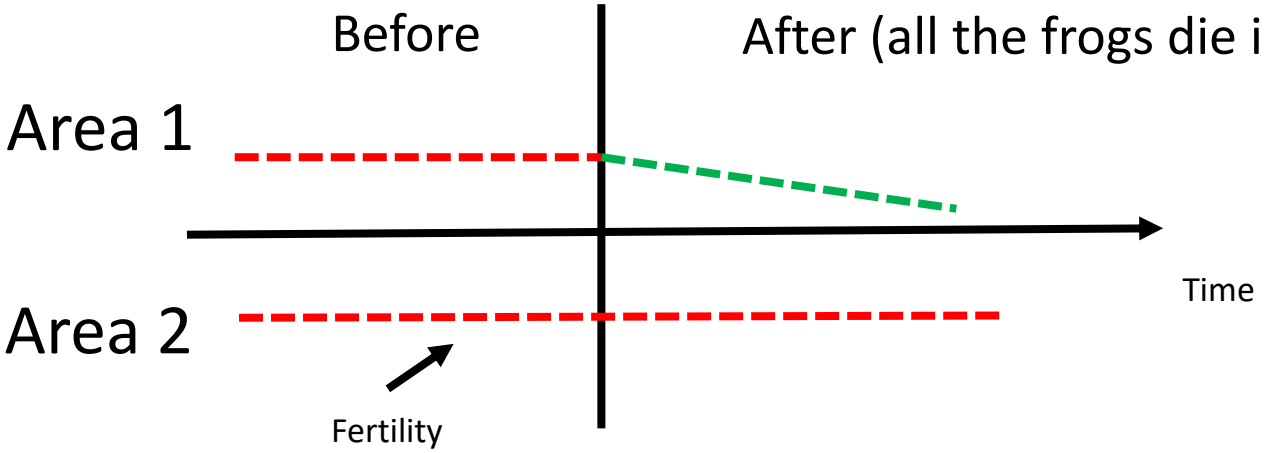
- Regression discontinuity design (RDD)
- Differences-in-differences (DiD)
- Instrumental variables (IV)



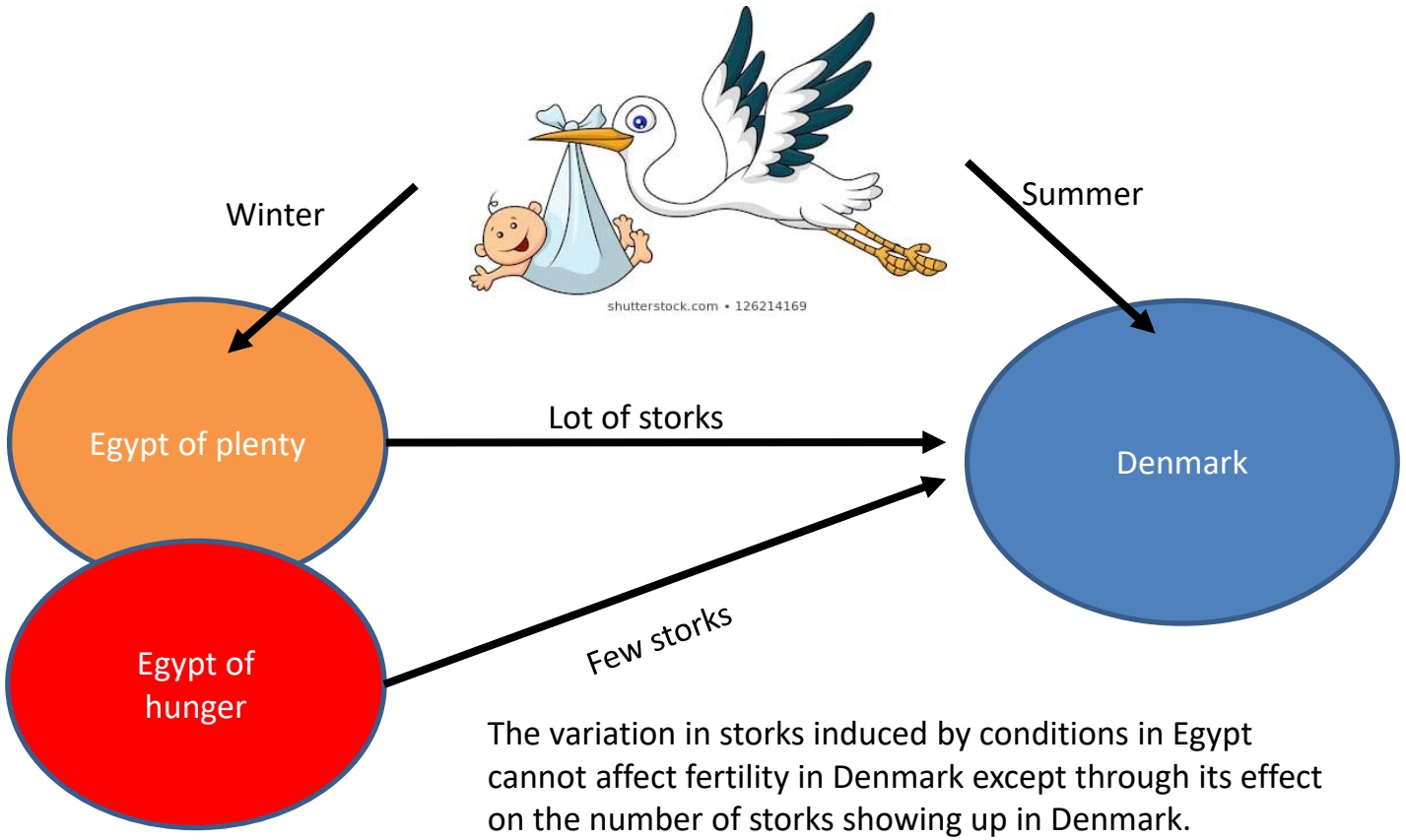
RDD



Difference in differences (DiD)



Instrument variables methods (IV)



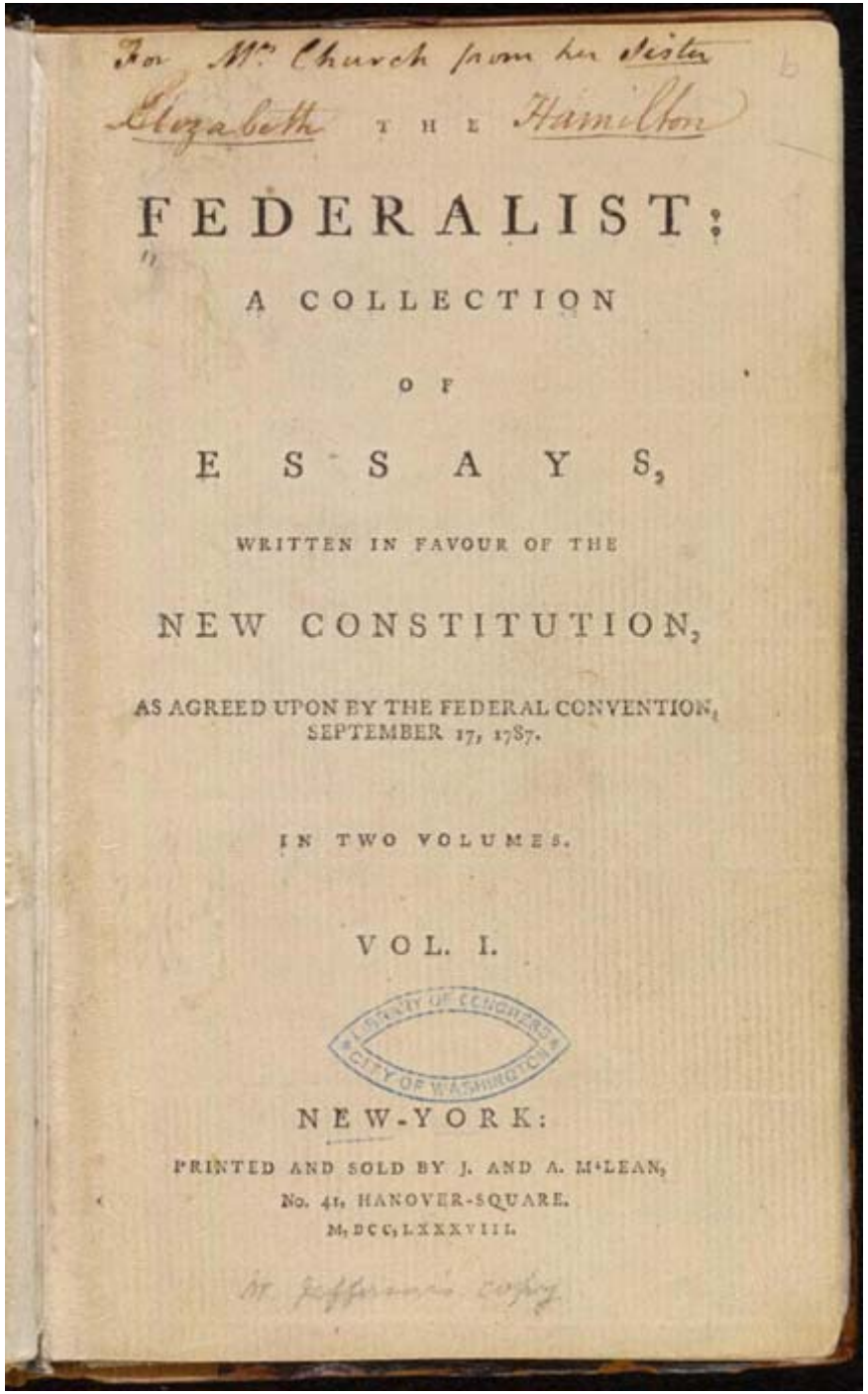
The variation in storks induced by conditions in Egypt cannot affect fertility in Denmark except through its effect on the number of storks showing up in Denmark.

Political Selection

- *"The aim of every political Constitution, is or ought to be, first to obtain for rulers men who possess most wisdom to discern, and most virtue to pursue, the common good of society"*

  - James Madison (1788, [1961]) in Besley (2005)

- Even if we could devise the right economic policy for the public good, it might not be properly implemented as long as the wrong type of politician holds office


For Mrs Church from her Sister
Elizabeth

THE

FEDERALIST:

A COLLECTION

OF

ESSAYS,

WRITTEN IN FAVOUR OF THE

NEW CONSTITUTION,

AS AGREED UPON BY THE FEDERAL CONVENTION,
SEPTEMBER 17, 1787.

IN TWO VOLUMES.

VOL. I.

NEW-YORK:

PRINTED AND SOLD BY J. AND A. M'LEAN,
No. 41, HANOVER-SQUARE.
M, DCC, LXXXVIII.

Mr Jefferson's copy

Questions

- Does it matter for policy which politician is in power?
  - Are they 'all the same'?
  - For voting to have instrumental benefits, votes need to affect the election outcome AND it has to matter which politician is in power
- How do the possible effects depend on the particular characteristics of the politicians?
- What are the theoretical arguments?
- What empirical identification strategies we can use answer these questions?


TRUMP
MAKE AMERICA GREAT AGAIN!
Hillary
Hillary
Hillary

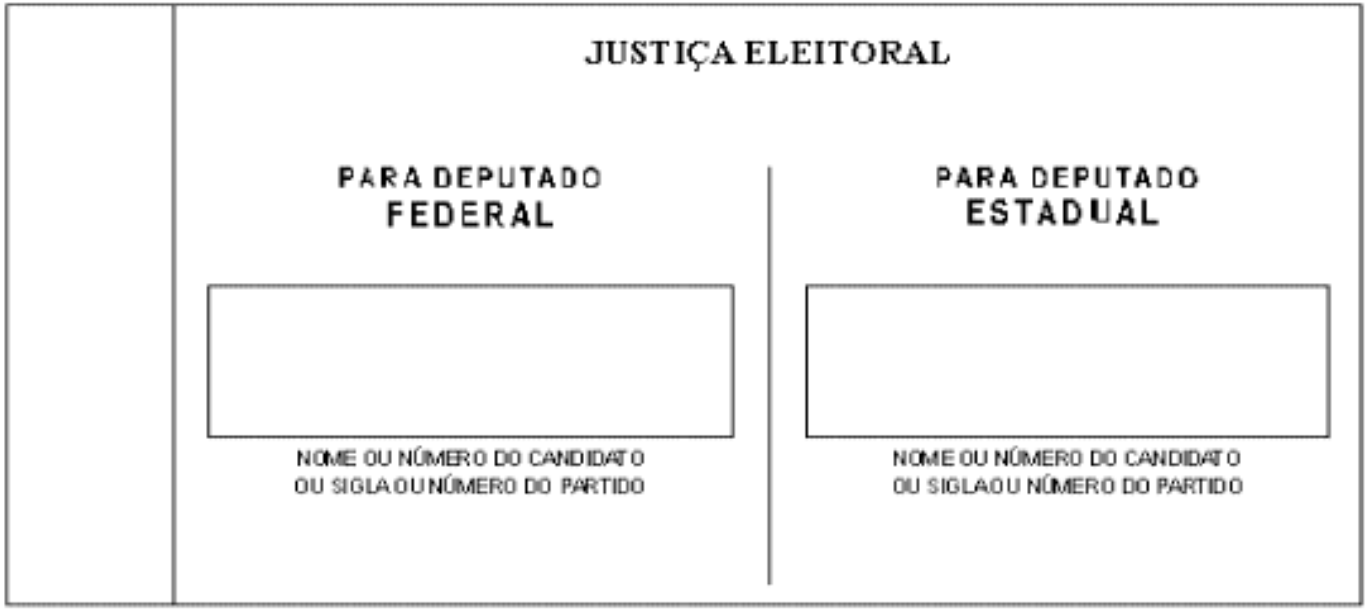
Theory

- Many theories, but prominent examples:
- Median voter models (e.g., Hotelling 1929, Downs 1957) predict that competition for votes forces parties to adopt identical moderate policies (or at least to pursue similar moderate policies even if not identical (e.g., Wittman 1983))
- In citizen-candidate models (Alesina 1988, Besley and Coate 1997, Osborne and Slivinski 1996) elected politicians will implement their preferred policies as a citizens. Citizens enter politics if costs low enough
- Seems to be an empirical question, and RCTs not that easy to achieve…

Fujiwara 2015, Econometrica

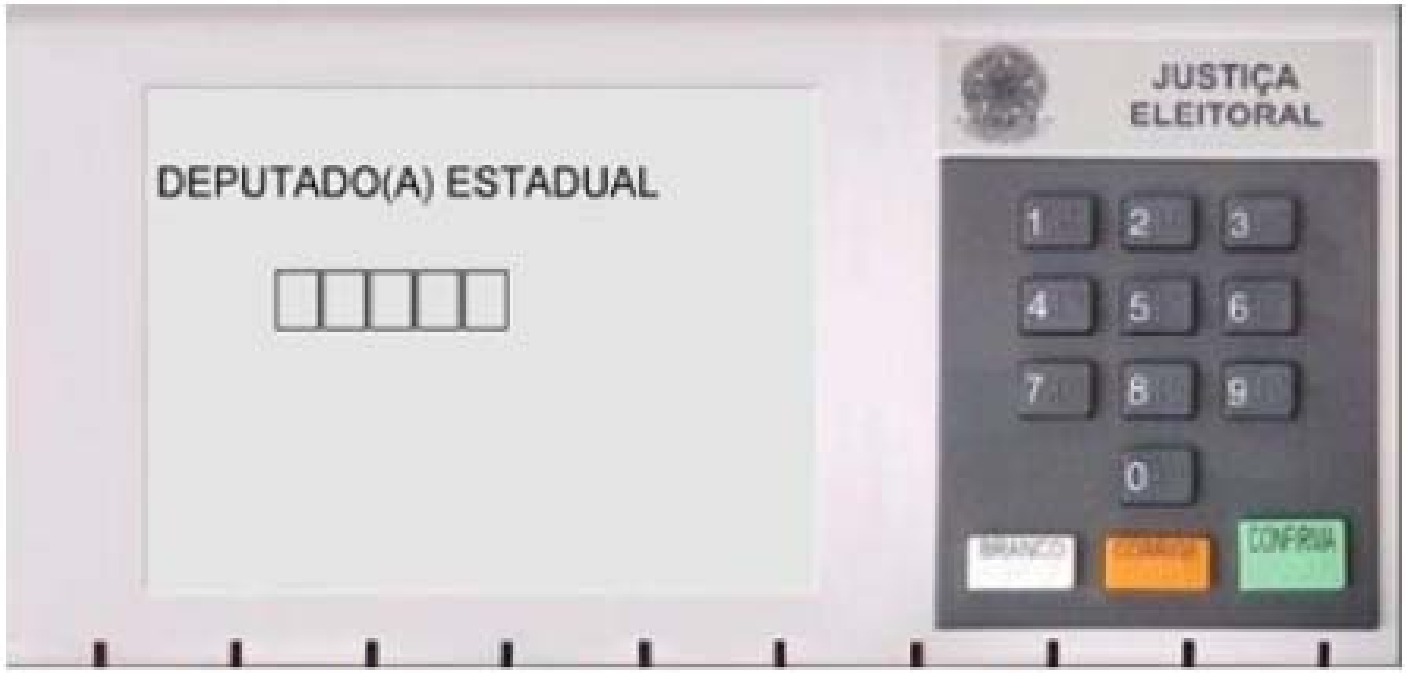
- Electronic voting aid in Brazil
  - Compulsory voting, but in practice a large enfranchisement of many poor uneducated voters by having less invalid votes
  - Electoral outcomes: Left parties gain
  - What happens to policy? Some evidence of improvement in child health (not shown today)
- Identification based both on RDD on population threshold and different timing of reform across cities (DID)

Paper ballot



Paper ballot

Electronic voting aid

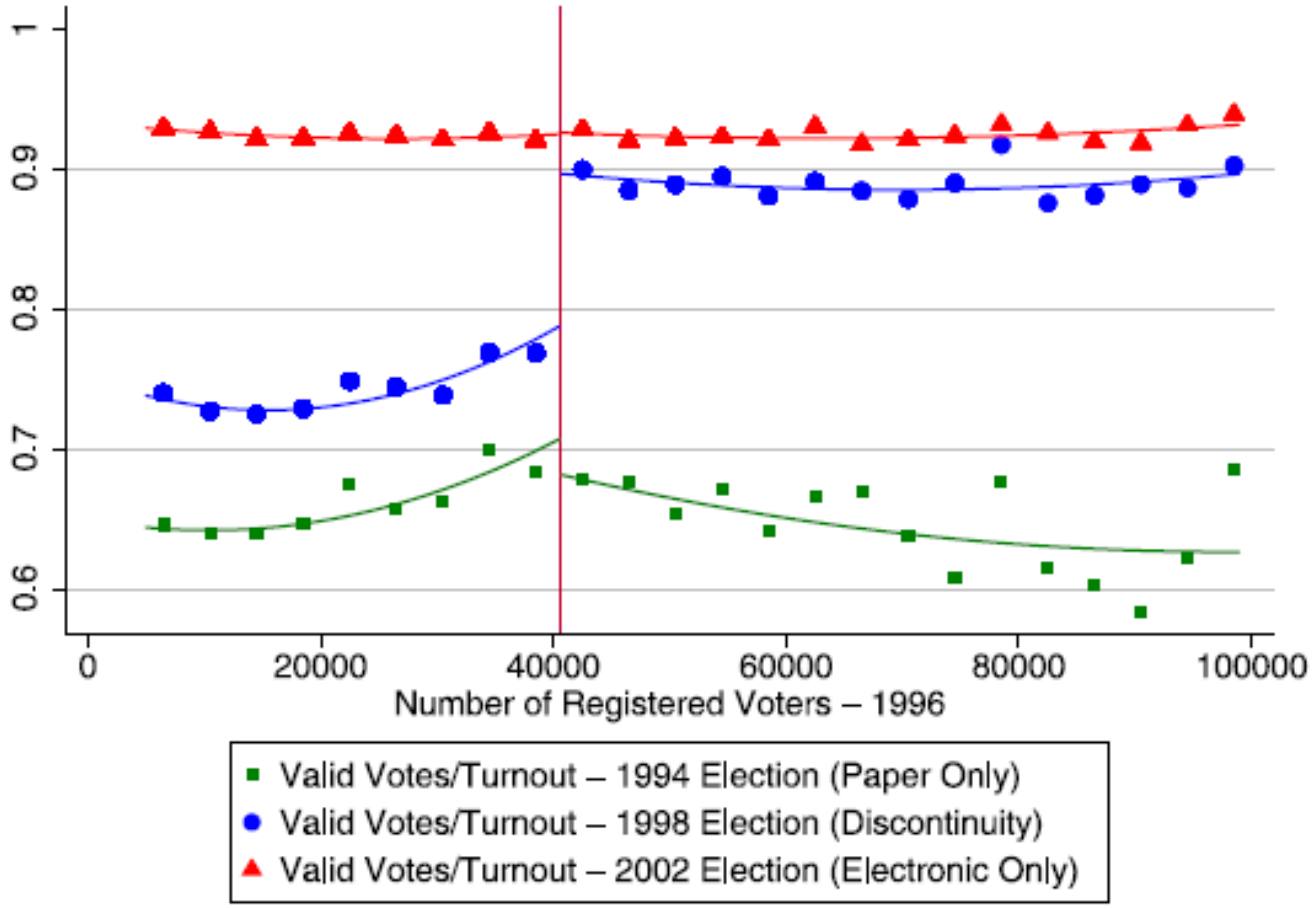


Initial screen of the voting technology

Electronic voting aid

Voting for (fictional) candidate number 92111 (name: Monteiro Lobato, party: PLT)

Results on valid votes



Electoral outcomes

TABLE II

TREATMENT EFFECTS OF ELECTRONIC VOTING[a]

	Full Sample Mean	Pre-Treat. Mean	IKBW {Obs.}	(1)	(2)	(3)
Panel A: Baseline Results						
Valid Votes/Turnout	0.755	0.780	11,873	0.118	0.121	0.124
(1998 Election)	[0.087]	(0.013)	{265}	(0.015)	(0.016)	(0.025)
Turnout/Reg. Voters	0.765	0.785	12,438	−0.005	0.013	0.007
(1998 Election)	[0.091]	(0.011)	{283}	(0.019)	(0.021)	(0.033)
Reg. Voters/Population	0.748	0.737	15,956	−0.004	0.010	0.032
(1998 Election)	[0.141]	(0.010)	{388}	(0.027)	(0.034)	(0.044)
Panel B: Placebo Tests (Election Years Without Discontinuous Assignment)						
Valid Votes/Turnout	0.653	0.697	17,111	−0.013	−0.008	0.006
(1994 Election)	[0.099]	(0.011)	{433}	(0.019)	(0.023)	(0.032)
Valid Votes/Turnout	0.928	0.921	17,204	0.005	0.008	0.009
(2002 Election)	[0.026]	(0.002)	{437}	(0.005)	(0.006)	(0.010)
Panel C: Do Left-Wing Parties Benefit Disproportionately From Electronic Voting?						
Vote-Weighted Party	5.397	5.162	20,000	−0.222	−0.250	−0.108
Ideology (1998 Elec.)	[0.692]	(0.094)	{558}	(0.100)	(0.081)	(0.170)
Bandwidth				IKBW	10,000	5000
Specification				Linear	Linear	Linear
N	5281			—	229	116

Hyytinen et al. 2018, APSR

- In 2013, public employees accounted for 21% of total employment in OECD countries
  - Finland: 30% in total, more than 20% locally
- Public employees who simultaneously hold political office create a conflict of interest
  - Better opportunities for rent-seeking than private sector employees due to information advantage on the true costs and benefits of providing public services (Niskanen 1971)
- Some countries have restrictions on the political participation of public employees
  - A trade-off: may decrease rent-seeking, but excludes informed and competent candidates
- Yet very little is known whether political representation of public employees affects policy

Our paper

- Effect of political representation of municipal employees on local public spending
- Identification based on close elections at candidate level within parties, but analysis at the municipality level
- Data from Finnish local governments 1996-2012 and local elections in 1996, 2000, 2004 and 2008
  - Municipal employees seat share is 26 % on average
- Look more closely at specific spending and occupation categories
- Analyze political mechanisms and evidence of different theoretical explanations

Election system

- Municipal elections are held (simultaneously) every four years
- Proportional representation where seats allocated using the d'Hondt comparison method
- Each voter can only vote for a single candidate (cannot vote for a party in isolation of a candidate)
- The sum of votes to a list determines the seats to the list and voters determine candidate rank within lists (open-list)
- The number of seats to a party and individual candidate's election depend on the entire vote vector, not only on own votes

Objective

- We are interested in estimating δ in

$$Y_{mt} = X'_{mt}\beta + \delta M_{mt} + u_{mt}$$

- where Y_{mt} is (log) spending and M_{mt} is seat share of municipal employees
- M_{mt} most likely endogenous due to e.g. voter preferences
- Need to instrument for M_{mt}
- Use close elections where the election outcome can be seen as "as-good-as-random"

Close elections identification

- We define closeness within party lists

  1. Define the *pivotal number of votes* as the average of the maximum number of votes among non-elected candidates and the minimum number of votes among elected candidates

  2. The *distance* to getting elected for each candidate is then the number of votes of the candidate minus the pivotal number of votes in the party list *p*

  3. Normalize the distance measure by dividing it by the total number of votes of the party list and multiply by 100 => v_{ipmt}

Close elections identification

- Indicator for closeness: $C_{ipmt} = \begin{cases} 1 \text{ if } |v_{ipmt}| \leq \varepsilon \\ 0 \text{ if } |v_{ipmt}| > \varepsilon \end{cases}$

  where ε is a bandwidth

- Party list level treatment is the actual number of elected mun. employees minus the expected number:

$$T_{pmt} = \left(\sum_{i=1}^{N_p} C_{ipmt} E_{ipmt} M_{ipmt} \right) - \left[\frac{\sum_{i=1}^{N_p} C_{ipmt} M_{ipmt}}{\sum_{i=1}^{N_p} C_{ipmt}} \sum_{i=1}^{N_p} C_{ipmt} E_{ipmt} \right]$$

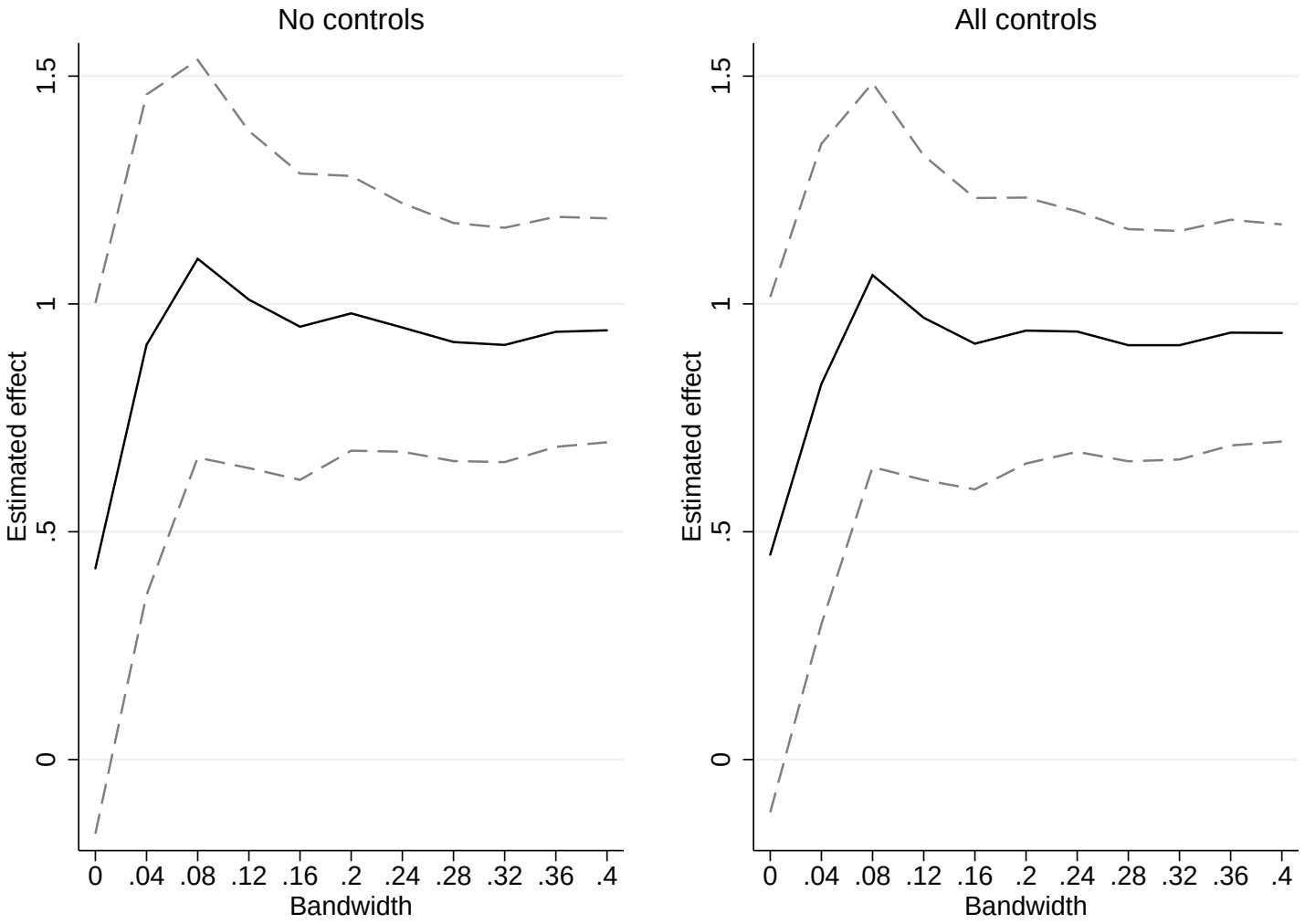
- The municipal level instrument is

$$T_{mt} = 100 * \left(\sum_{p} T_{pmt} \right) / CS_{mt}$$

Example for one party list

				$\epsilon = 0$	$\epsilon = 0.4$	$\epsilon = 1$
Votes	v_{ipmt}	E_{ipmt}	M_{ipmt}	C_{ipmt}	C_{ipmt}	C_{ipmt}
230	25.32	1	0	0	0	0
182	18.57	1	1	0	0	0
57	0.98	1	0	0	0	1
54	0.56	1	0	0	0	1
50	0.00	1	1	1	1	1
50	0.00	0	1	1	1	1
49	-0.14	0	1	0	1	1
22	-3.94	0	0	0	0	0
16	-4.78	0	1	0	0	0
1	-6.89	0	1	0	0	0
		Actual elected		1	1	1
		Expected elected		1	1	1.8
			T_{pmt}	0	0	-0.8

The first stage



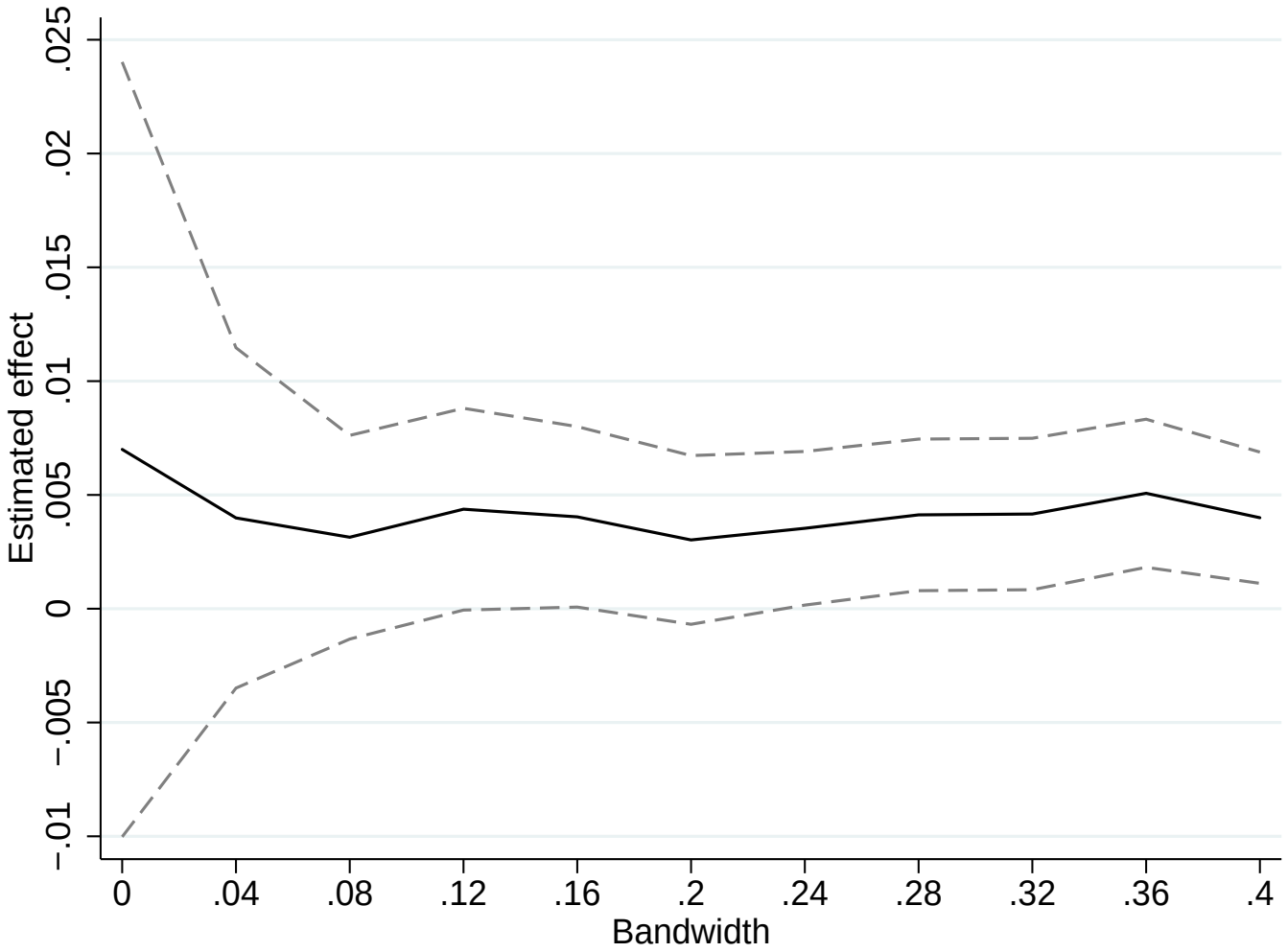
Pre-treatment balance

	Positive treatment			Negative treatment			
ε = 0.4	N	Mean	Std. Dev.	N	Mean	Std. Dev.	Difference
Total expenditures (€ per capita)	404	5 334	828	406	5 327	818	6.67
Health care expenditures (€ per capita)	404	1 631	392	403	1 636	359	-5.27
Other expenditures (€ per capita)	404	3 703	679	403	3 691	654	11.70
Population	588	17 488	46 681	557	13 548	33 128	3 939
Young inhabitants %	588	18.67	3.29	557	18.63	3.26	0.04
Old inhabitants %	588	17.52	4.65	557	17.90	4.42	-0.38
Council size	588	31.91	11.81	557	30.55	10.80	1.35
Municipal employees %	404	28.38	13.49	403	27.69	12.99	0.70
Municipal health care employees %	404	7.43	5.06	403	7.09	4.81	0.35
Municipal non health care employees %	404	20.95	12.71	403	20.60	12.09	0.35
Incumbents %	404	58.12	8.54	403	57.20	9.06	0.92
Women %	404	33.69	9.02	403	33.12	8.45	0.57
High professionals %	404	23.07	12.84	403	21.79	11.90	1.28
University educated %	404	14.32	10.20	403	12.70	9.63	1.61
Unemployed %	404	3.81	3.79	403	3.58	4.03	0.23
Center Party seat share %	588	36.83	21.08	557	37.95	21.26	-1.11
Coalition Party seat share %	588	17.15	10.07	557	15.94	10.15	1.21
Social Democratic Party seat share %	588	21.70	11.83	557	21.55	11.56	0.15
Green party seat share %	588	2.40	3.94	557	1.92	3.52	0.48
Left Alliance seat share %	588	9.19	8.64	557	8.85	8.39	0.34
Swedish Party seat share %	588	4.54	16.16	557	5.70	18.47	-1.16
True Finns seat share %	588	1.84	3.92	557	1.63	3.77	0.20
Christian Democrats seat share %	588	3.04	3.65	557	3.08	3.61	-0.04
Other parties seat share %	588	3.31	6.28	557	3.38	6.59	-0.07

Aggregate spending

Panel A: IV, ε = 0.4	(1)	(2)	(3)	(4)
Municipal employees	0.0034*	0.0046***	0.0040***	0.0041***
	[0.0018]	[0.0017]	[0.0015]	[0.0016]
First stage F	57	60	60	289
Panel B: Reduced form of IV, ε = 0.4	(5)	(6)	(7)	(8)
Municipal employees	0.0032*	0.0043***	0.0037***	0.0036***
	[0.0017]	[0.0016]	[0.0014]	[0.0014]
R^2	0.29	0.42	0.57	0.58
N	1544	1544	1544	1544
Year dummies	Yes	Yes	Yes	Yes
Party controls	No	Yes	Yes	Yes
Municipality controls	No	No	Yes	Yes
Vote share	No	No	No	Yes

Aggregate spending, robustness



Magnitude

- The effect is surprisingly large
- Effect of an increase of one seat in an sized average council is roughly (at least) 1%
- Average annual municipal spending is around 5600 Euros per capita -> effect is around 60 euros per capita annually
- How can marginal councilors at potentially unimportant margin have this large impact given legal restrictions on their influence?

Mechanisms

1. Municipal employee majority in council or party
   - No: such instances are present in the data only very rarely
2. "Proposal power" (the only municipal employee in the party)
   - No: the effect is not heterogeneous in this dimension
3. The probability that a political leader (chairman of board or the council) is a municipal employee
   - No effect
4. General coalition formation in decision making
   - The effects seems to arise within the largest party in the council (often the Centre party)
5. Occupation specific effects
   - The effects are specific to own type (Niskanen 1971!)
   - Effects are not driven by gender

Sector specific spending

	Outcome: non health care expenditures	Outcome: health care expenditures
Panel A: IV, ε = 0.4	(1)	(2)
Municipal non health care employees	0.0045**	0.0016
	[0.0021]	[0.0036]
Municipal health care employees	0.0033	0.0081**
	[0.0033]	[0.0039]
First stage F	29.73	29.57
Joint test for health and non-health	0.32	0.47
Panel B: Reduced form of IV, ε = 0.4	(3)	(4)
Municipal non health care employees	0.0044**	0.0019
	[0.0021]	[0.0035]
Municipal health care employees	0.0025	0.0076**
	[0.0031]	[0.0036]
R^2	0.44	0.18
Joint test for health and non-health	0.07	0.09
N	1544	1534
Year dummies	Yes	Yes
Party and municipality controls	Yes	Yes

Conclusions

- Does it matter for policy which politician is in power? Often yes!
- How do the possible effects depend on the particular characteristics of the politicians (party label, gender, occupation…). In a way one would expect!
- What are theoretical arguments? Commitment or not
- What empirical identification strategies we can use answer these questions? Policy changes, close elections (even RCTs)