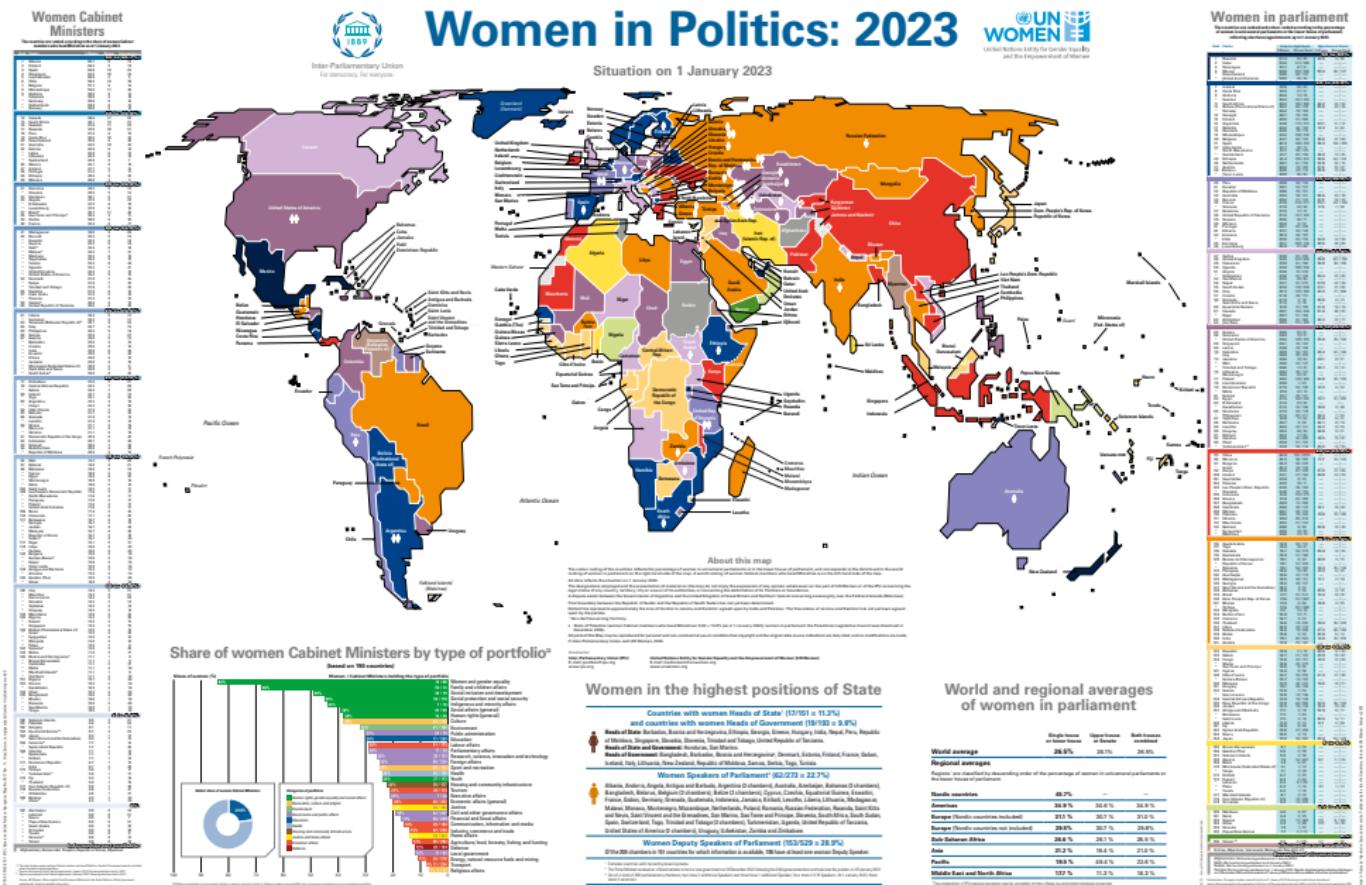


Political Glass Ceiling in Japan

Haishan Yuan

University of Queensland

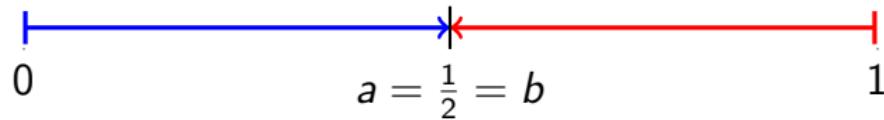
December 6, 2023



Motivation - Fairness

Hoteling-Downs Model

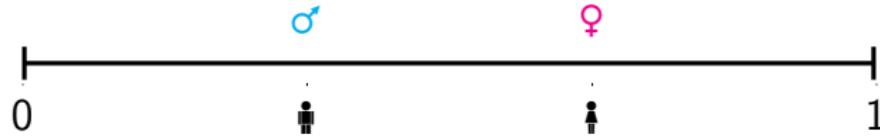
Since electoral competition drives policy convergence, the identities of politicians do not matter.



Motivation - Fairness

Citizen-Candidate Framework

Politicians can not commit to policy platforms. The identity, and hence preference and ideology, of a politician affect policies.



Empirical support for the Citizen-Candidate framework:

- For the U.S. House of Representatives, voters elect politicians who have their own agendas or policy preferences, rather than effect policies chosen by politicians.

(Lee et al, 2004)

- Female politicians in Indian local governments provide more public goods preferred by female constituents.

(Chattopadhyay & Duflo, 2004)

Motivation - Political Agency Problems

Good governments require:

- disciplining politicians with right incentives; and
- selecting competent politicians of civic virtue.

Besley (2005; 2006); Besley, Persson & Sturm (2010); Maskin & Tirole (2004); Synder & Strömberg (2010)

Barriers to equal representation could:

- weaken electoral competition; and
- limit the supplies of good politicians.

Besley & Burgess (2002); Besley et al. (2014); Brollo & Troiano (2014); Ferreira & Gyourko (2014); Anzia & Berry (2011)

Questions

- Why are females under-represented?
 - ▶ social norms on gender roles?
 - ▶ statistical discrimination?
 - ▶ systematically biased priors?
- What policy remedies?
 - ▶ altering electoral rules?
 - ▶ gender quota / seat reservation?
 - ▶ high profile appointments of females?

In This Paper:

- Japanese local elections
- Political selection through the lens of incumbency advantages
- Incumbency reveals information about politicians.
- Regression Discontinuity Design + Difference-in-Difference
- Being an incumbent improves future electoral prospects of candidates, particularly for female newcomers.
- Voters are biased against unfamiliar female candidates.

Road Map

- ① Introduction
- ② Background and Data
- ③ Political Glass Ceiling
- ④ Biases against Women?
- ⑤ Concluding Remarks

Municipal Council Election (e.g. \Rightarrow)

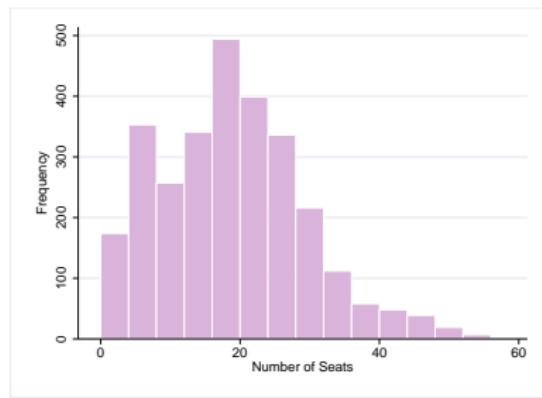
- Single-nontransferable vote
- $M > 1$ seats
- $N \geq M$ candidates
- One person, one vote
- The M candidates with highest votes are elected.

# Votes	Candidate	Rank
194	A	1
190	B	2
180	C	3
167	D	4
148	E	5
145	F	6
129	G	7
128	H	8 $\leftarrow M$
127	I	9
125	J	10
100	K	11
69	L	12 $\leftarrow N$

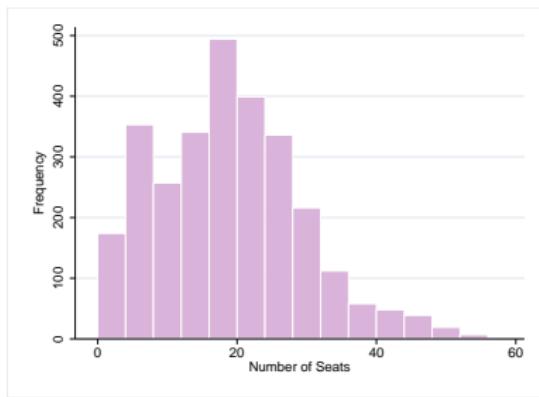
Municipal council elections:

- Unsynchronized with mayoral elections
- Lowest entry barriers
- Single non-transferable vote
- Comparison of candidates in the same election

Councils have different number of seats:



Councils have different number of seats:



To compare electoral performance of candidates across council elections, normalize rank:

$$Q_{ij} = \frac{N_j - R_{ij} + 1}{N_j}$$

where

Q_{ij} is the normalized rank of candidate i in election j ;

N_j is the number of seats in election j ;

R_{ij} is the rank of candidate i in election j .

$$Q_{ij} \in (0, 1]$$

$Q_{ij} = 1$ for the candidate with the most votes

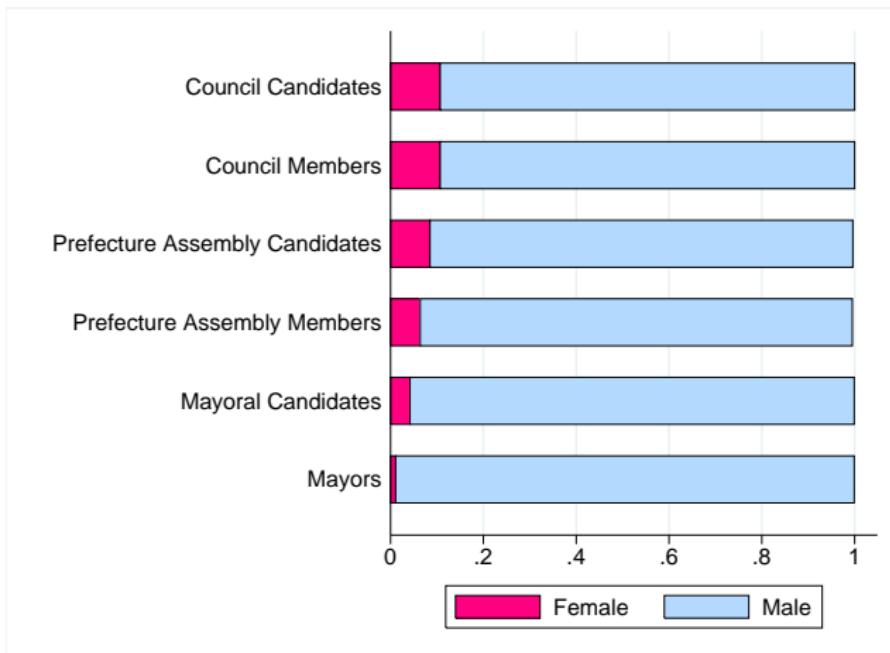
Data

- January 1998 to September 2014
- From website www.go2senkyo.com
- Municipal council elections
 - ▶ dropping elections of all male candidates
 - ▶ dropping the most recent elections
- 2,853 council elections
- 47,192 candidates
- 64,014 election-candidates

Road Map

- ① Introduction
- ② Background and Data
- ③ Political Glass Ceiling
- ④ Biases against Women?
- ⑤ Concluding Remarks

Share of Female Candidates and Members of Various Offices (Municipality ∈ Prefecture ∈ Japan)

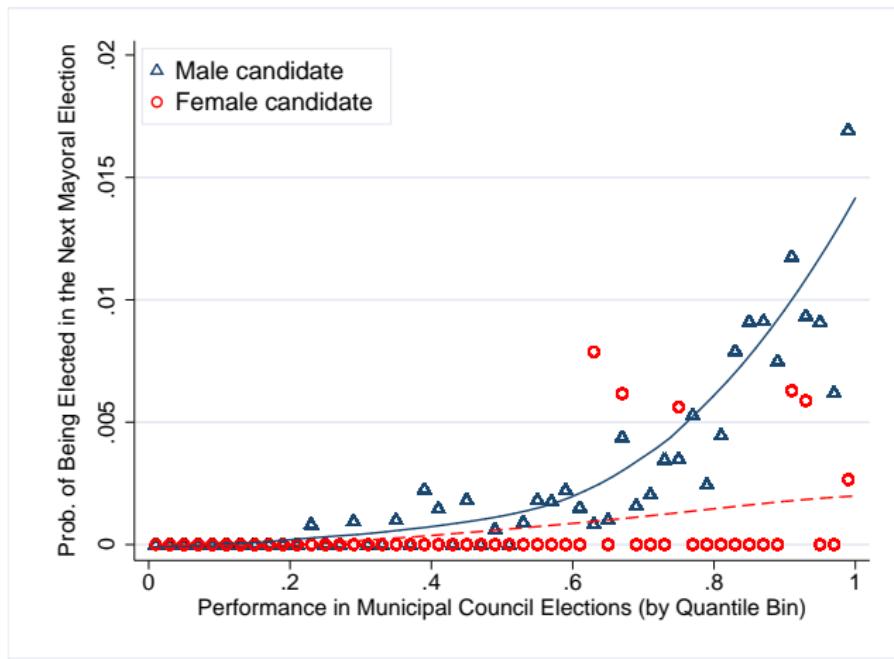


Notes: Year 1998 - Year 2014

Political Glass Ceiling

Council → Mayor?

Prob. of Being Elected for Mayor by Performance in the Last Council Election

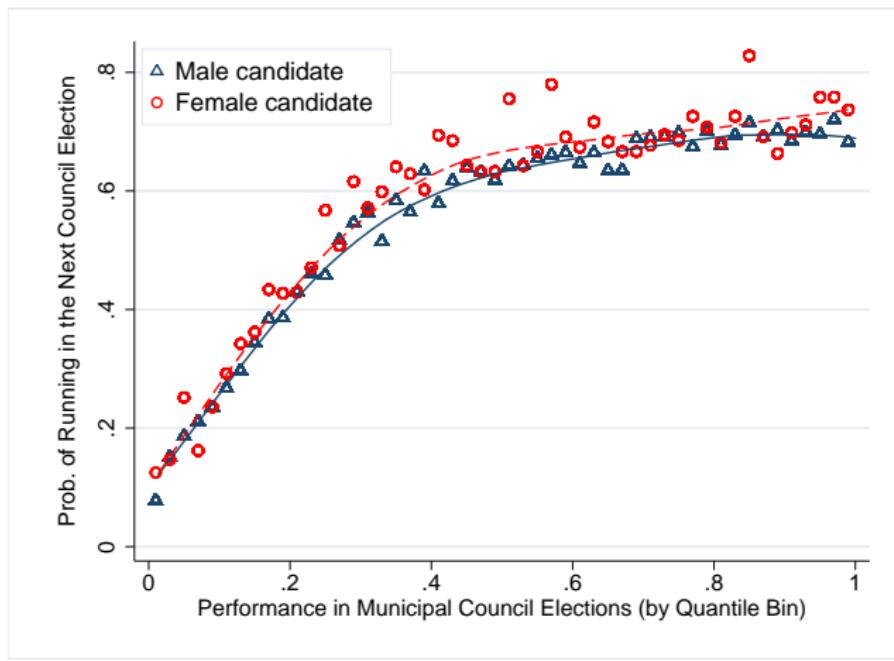


Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Political Glass Ceiling

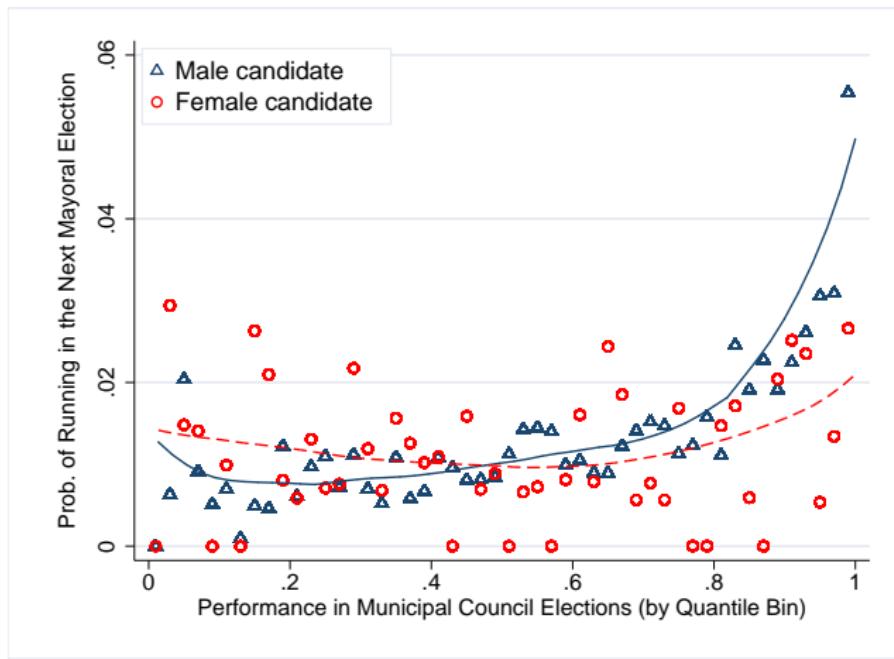
Women Unwilling to Run?

Probability of Running for Municipal Council by Performance in the Last Council Election



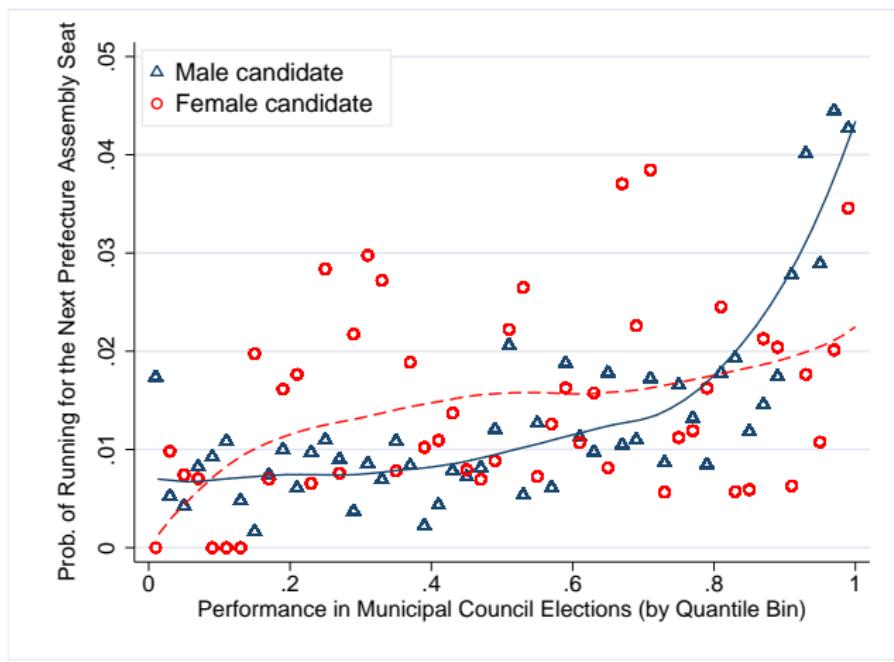
Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Prob. of Running for Mayor by Performance in the Last Council Election



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Probability of Running for Prefecture Assembly by Performance in the Last Council Election



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Questions

- Why “bamboo ceiling”?
 - ▶ thick, hard and let no light through

Questions

- Why “bamboo ceiling”?
 - ▶ thick, hard and let no light through
- Electoral discrimination?
 - ▶ social norms on gender roles?
 - ▶ statistical discrimination?
 - ▶ systematically biased priors?

Questions

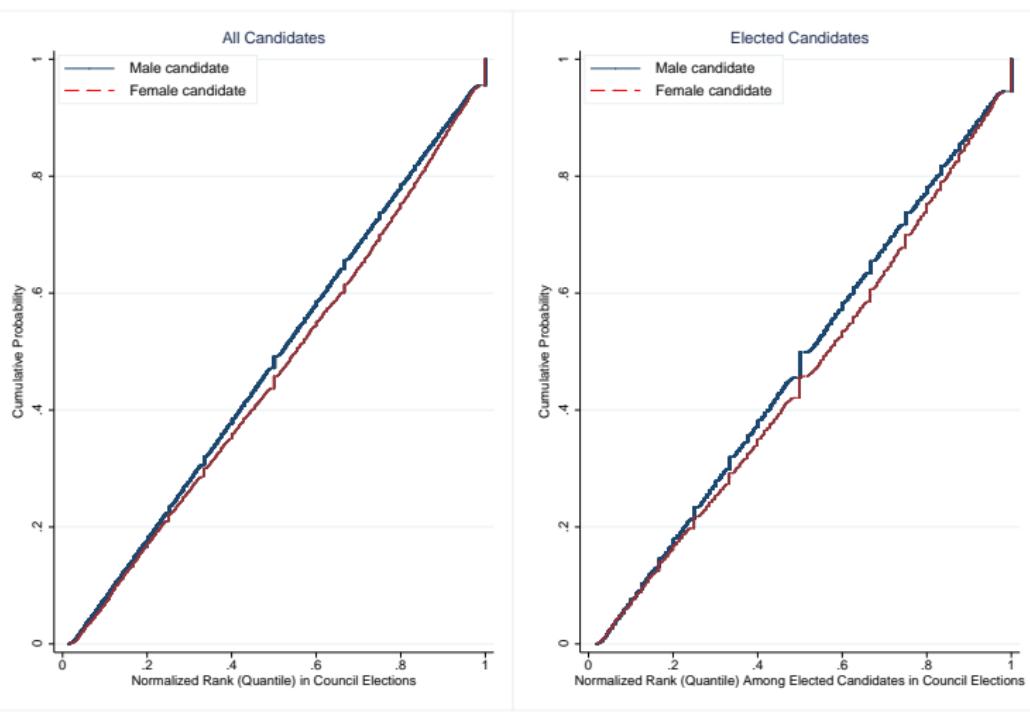
- Why “bamboo ceiling”?
 - ▶ thick, hard and let no light through
- Electoral discrimination?
 - ▶ social norms on gender roles?
 - ▶ statistical discrimination?
 - ▶ systematically biased priors?

Statistical Discrimination at Polls?

No Prima Facie Evidence

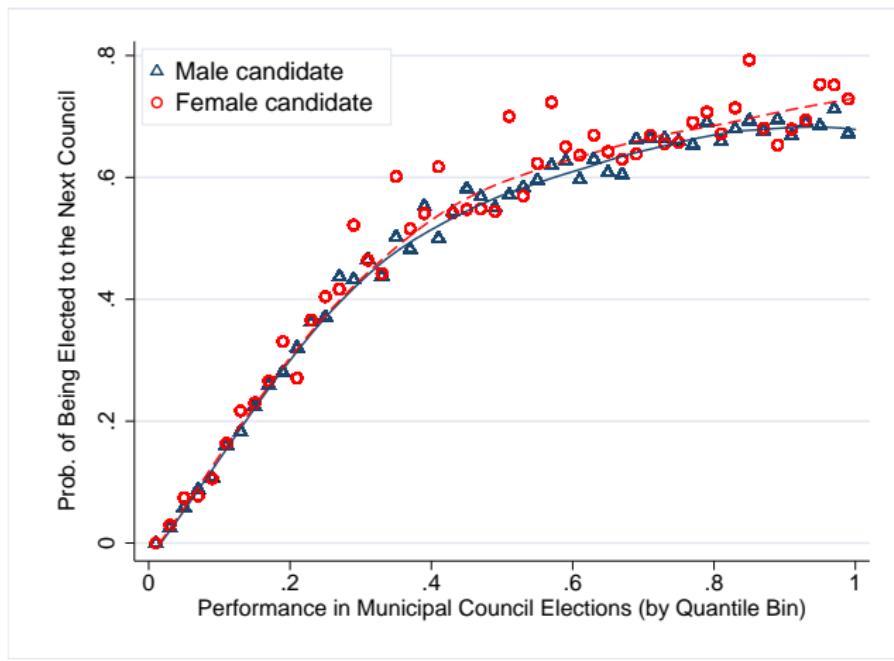
► A Simple Model of Political Selection

Empirical CDF of Normalized Ranks



Notes: The horizontal axes represent normalized ranks among the defined set of candidates.

Probability of Being Elected to Municipal Council by Performance in the Last Council Election



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Biases Against Female Candidates?

Evidence: Diff-in-Diff of RD Identified Incubency Advantages

Road Map

- ① Introduction
- ② Background and Data
- ③ Political Glass Ceiling
- ④ Biases against Women?
- ⑤ Concluding Remarks

Empirical Strategy

- Inc incumbency reveals information about politicians.
- Those who were biased against benefit more.
- Not the case for statistical discrimination.

► A Simple Model of Political Selection

Inc incumbency Advantage (IA)

advantageous electoral prospects of incumbents over non-incumbents

Inc incumbency Advantage (IA)

advantageous electoral prospects of incumbents over non-incumbents

Newcomers IA vis-à-vis Current-Incumbents IA

- Δ_F : for females
- Δ_M : for males

Inc incumbency Advantage (IA)

advantageous electoral prospects of incumbents over non-incumbents

Newcomers IA vis-à-vis Current-Incumbents IA

- Δ_F : for females
- Δ_M : for males

Diff-in-Diff of IA: $\Delta_F - \Delta_M$

RDD for Inc incumbency Advantages

- Incumbent status correlates with unobservables like charms, qualifications etc.
- Simple comparison may result upwardly biased estimates of IA
- Quasi-randomization of incumbent status in close elections
- Nonparametric RD estimation

Election Threshold:

$$\Psi = \frac{VS_M + VS_{M+1}}{2}$$

- VS_M : vote share of the elected candidate winning fewest votes
- VS_{M+1} : vote share of the unelected candidate with most votes
- M : number of seats

Running Variable:

$$MV_i = VS_i - \Psi$$

- VS_i : vote share of Candidate i
- Candidate i elected if and only if $MV_i \geq 0$

$$Y_i = \alpha_i + \beta_i W_i + \epsilon_i$$

- Y_i : = 1 if elected in the *next* council election; = 0 otherwise
- W_i : = 1 if elected in the *current* council election; = 0 otherwise
- $W_i = \mathbf{1}(MV_i \geq 0)$

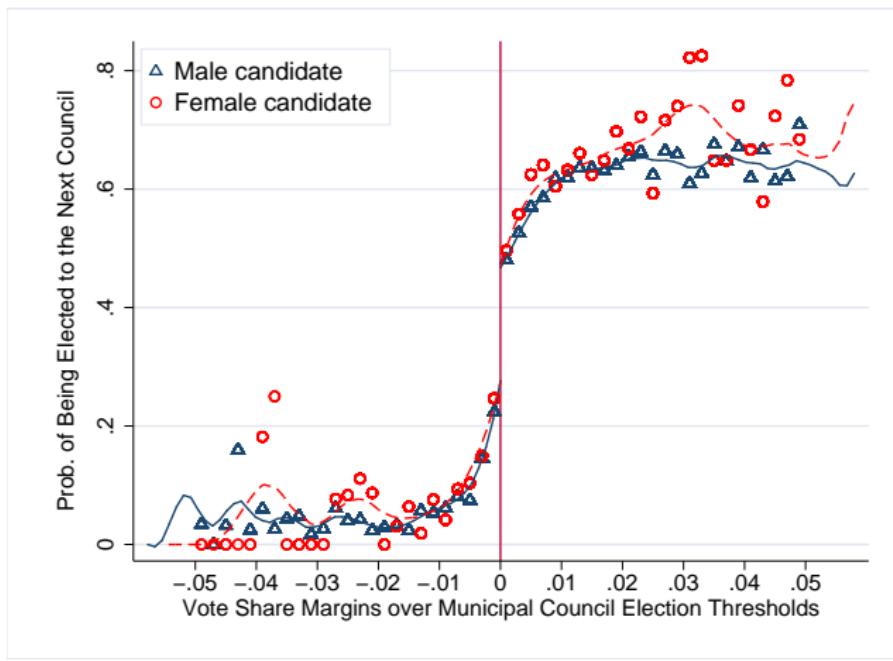
Identification Assumptions

$E(\alpha_i | MV_i = z)$ & $E(\beta_i | MV_i = z)$ are continuous in z at 0 in each of the following subsamples:

	Newcomer	Incumbent	
Female	(1)	(2)	$\Delta_F = (1) - (2)$
Male	(3)	(4)	$\Delta_M = (3) - (4)$

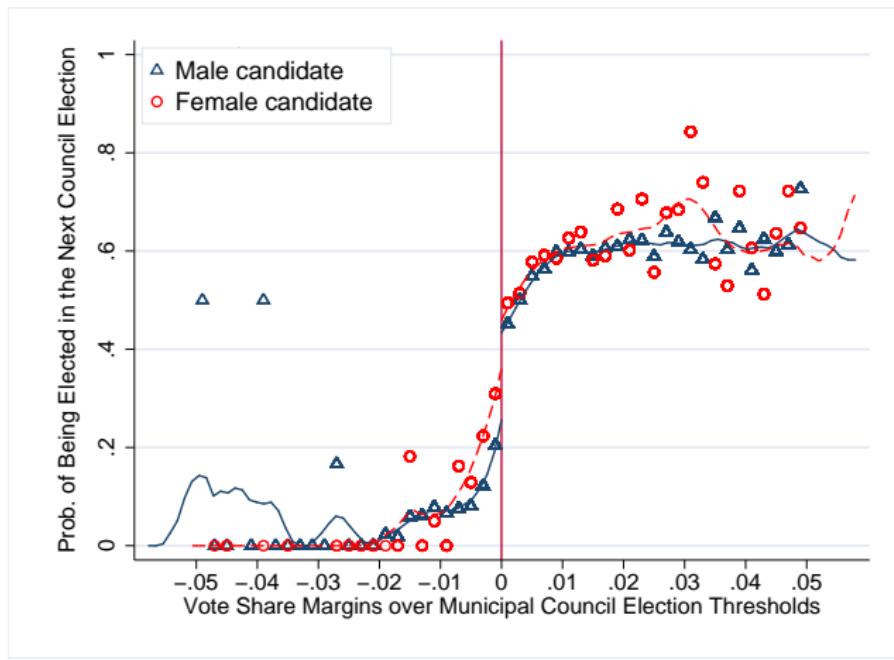
(Hahn, Todd & van der Klaauw (2001); Lee & Lemieux (2010); Porter (2013); Calonico, Cattaneo & Titiunik (2014a, 2014b))

Probability of Being Elected to Municipal Council by Vote Share Margin over Election Threshold



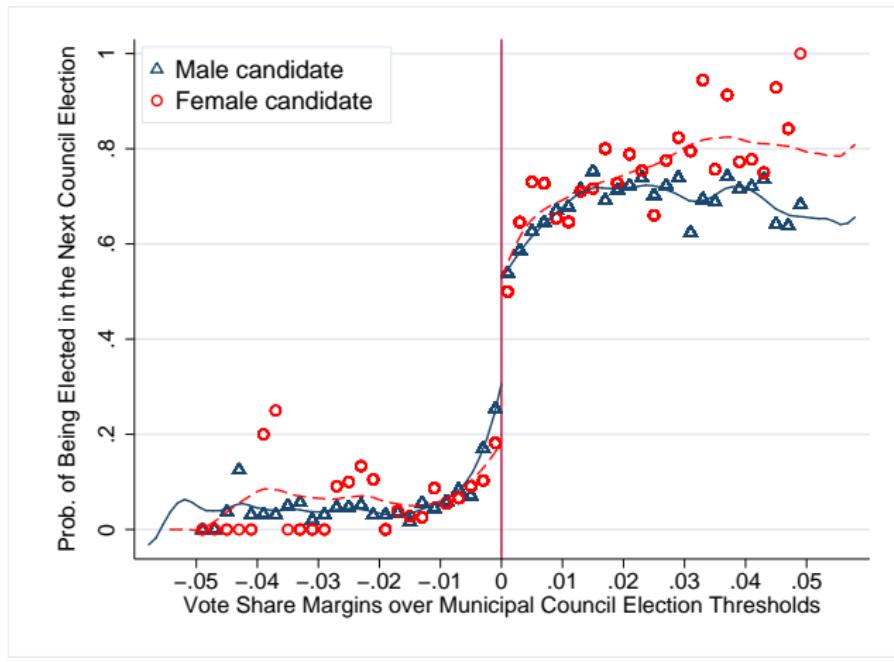
Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Probability of Being Elected to Municipal Council (Incumbent Candidates)



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Probability of Being Elected to Municipal Council (Non-Incumbent Candidates)



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Nonparametric Estimates of Incumbency Advantages in the Following Elections

	Bias-corrected RD Estimate	Robust S.E.	p-value	# Obs.
All Candidates	0.182	0.016	0.000	15783
Incumbents	0.162	0.020	0.000	9752
Non-incumbents	0.218	0.022	0.000	7601
Male Candidates	0.184	0.017	0.000	14053
Male Incumbents	0.170	0.021	0.000	8843
Male Non-incumbents	0.213	0.024	0.000	6652
Female Candidates	0.182	0.035	0.000	3216
Female Incumbents	0.083	0.057	0.145	1620
Female Non-incumbents	0.328	0.045	0.000	1723

Difference-in-Differences of Inc incumbency Advantages

Differences in Inc incumbency Advantages		Point Estimate	p-value
Δ_I	F. Incumbents – M. Incumbents	-0.087	0.920
Δ_{NI}	F. Non-inc. – M. Non-inc.	0.115	0.045
Δ_F	Female Non-inc. – Female Inc.	0.245	0.005
Δ_M	Male Non-inc. – Male Inc.	0.043	0.110
$\Delta_F - \Delta_M$		0.202	0.010

Notes: p-values are for one-side tests $\Delta \leq 0$ and bootstrapped by re-sampling council elections 200 times.

Alternative Explanations

- The diff-in-diff of RD-identified incumbency advantages may just reflect different local effects.
- Women lack outside options and hence work harder for re-elections.
- There is statistical discrimination but it favors women.

Parametric Diff-in-Diff of RD Identified Incubency Advantages

	(1)	(2)	(3)	(4)	(5)	(6)
Elected	0.252*** (0.013)	0.262*** (0.012)	0.418*** (0.009)	0.209*** (0.015)	0.204*** (0.015)	0.373*** (0.010)
Elected × Female	-0.085 (0.052)	-0.056 (0.044)	-0.026 (0.035)	-0.132* (0.068)	-0.047 (0.062)	-0.024 (0.042)
Elected × Non-incumbent	0.090*** (0.019)	0.082*** (0.019)	0.122*** (0.012)	0.059** (0.025)	0.069*** (0.025)	0.100*** (0.015)
Elected × Female × Non-inc.	0.196*** (0.070)	0.161** (0.065)	0.090** (0.044)	0.219** (0.095)	0.124 (0.091)	0.133** (0.056)
Sample (ρ s.t. $ MV_{ij} \leq \rho$)	0.02	0.02	0.02	0.01	0.01	0.01
Polynomial $g_{fn}(\cdot)$	Quadratic	Linear	Constant	Quadratic	Linear	Constant
R^2	0.3517	0.3516	0.3370	0.3692	0.3688	0.3559
Number of Observations	48526	48526	48526	31646	31646	31646

Notes: All specifications based on the following equation include gender-election-incumbent-status fixed effects μ_{jfn} . Standard errors in parentheses are robust to clustering two-way on election and on candidate. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

$$\begin{aligned}
 Y_{ij} = & \left[\beta_0 + \beta_1 \cdot F_i + \beta_2 \cdot NI_{ij} + \beta_3 \cdot F_i \cdot NI_{ij} \right] \cdot W_{ij} \\
 & + \left[\sum_{f=0}^1 \sum_{n=0}^1 \mathbf{1}(F_i = f) \cdot \mathbf{1}(NI_{ij} = n) \cdot g_{fn}(MV_{ij}) \right] + \mu_{jfn} + \epsilon_{ij}
 \end{aligned}$$

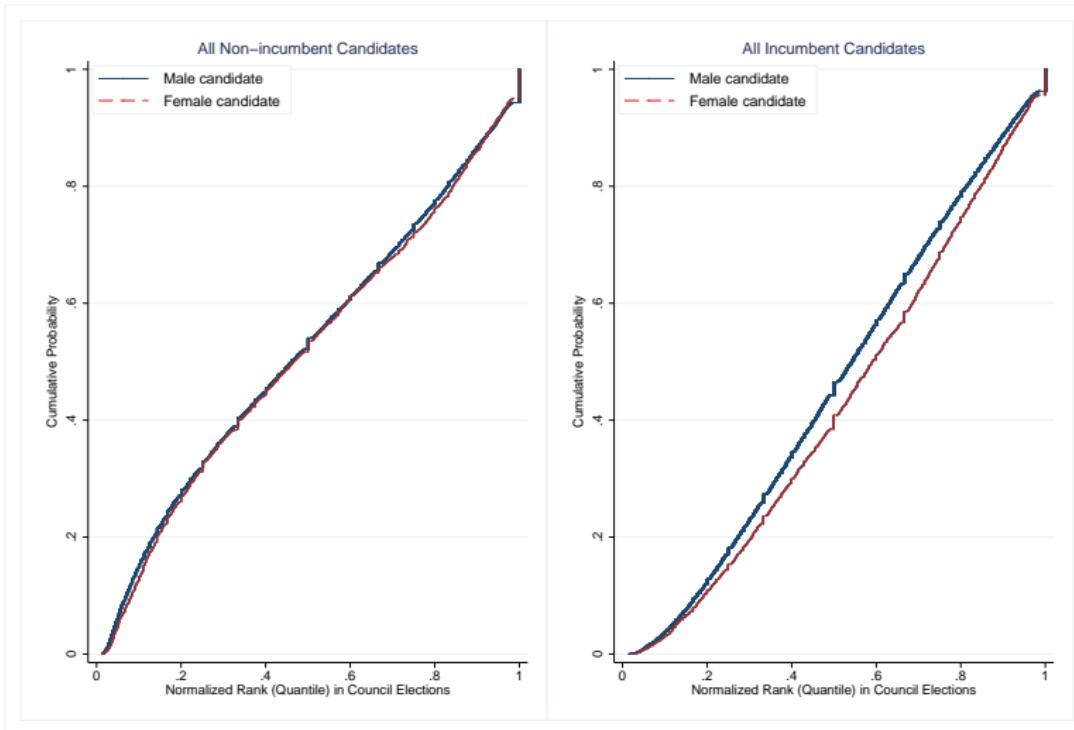
Lack of Outside Options

- Women may be discriminated elsewhere in the labor markets.
- They lack good outside options and hence work harder as councilwomen.
- Incentives, not types, make women more successfully in re-election.
- But marginally elected councilwomen do not have higher re-election probability than marginally elected councilmen.
- Moreover, from the perspective of a rational voter, it is unclear why this is not a good type?

Statistical Discrimination Favoring Women

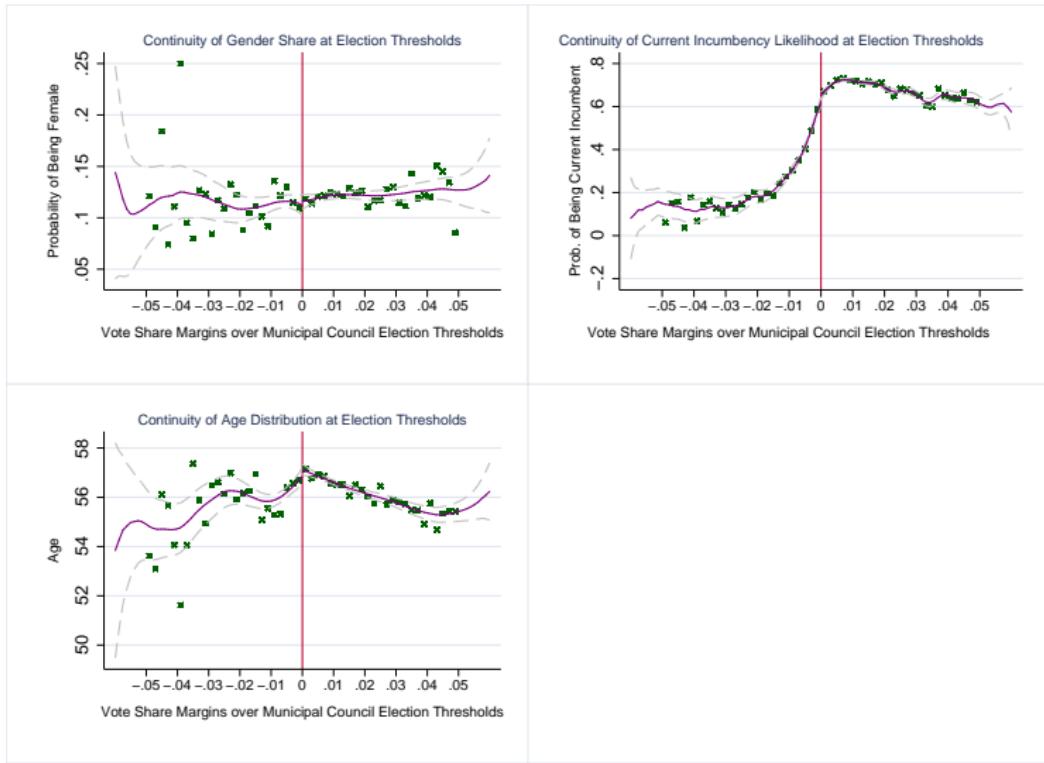
- Voters might rationally expected unfamiliar women to be better politicians than unfamiliar men.
- Higher IAs for female newcomers may reflect such a rational expectation.
- But
 - ▶ female newcomers on average do not outperform male newcomers in council elections;
 - ▶ female current-incumbents on average outperform male current-incumbents, but they do not have a higher IA.

Empirical CDF of Normalized Ranks



Notes: The horizontal axes represent normalized ranks among the defined set of candidates.

Tests of Continuity of Covariates at Election Thresholds



Road Map

- ① Introduction
- ② Background and Data
- ③ Political Glass Ceiling
- ④ Biases against Women?
- ⑤ Concluding Remarks

Policy Implications

- Introducing quota system may have short-run costs as under-qualified candidates assume positions.
- Less so if voters are biased against unfamiliar female candidates.
- Also, political reservation could help shaping social norms.

Contributions

- Novel data set of Japanese local elections
- Documenting under-representation & glass ceiling
- Methodology: RD + Diff-in-Diff
- Find voter biases

Thanks!

Comments welcomed:

h.yuan@uq.com

Appendix

Linear Probability Model:

$$Y_i = \alpha_i + \beta_i W_i + \epsilon_i$$

- Y_i : = 1 if elected in the *next* council election; = 0 otherwise
- W_i : = 1 if elected in the *current* council election; = 0 otherwise
- $W_i = \mathbf{1}(MV_i \geq 0)$

$$Y_i = \alpha_i + \beta_i W_i + \epsilon_i$$

Identification Assumptions:

- a $E(\alpha_i | MV_i = z, F_i, NI_i)$ is continuous in z at 0.
- b $E(\beta_i | MV_i = z, F_i, NI_i)$ is continuous in z at 0.

where

F_i : binary variable indicating female or not

NI_i : binary variable indicating newcomer or otherwise

(Hahn, Todd & van der Klaauw, 2001)

Non-parametrically identified:

$$E(\beta_i | MV_i = 0, F_i, NI_i) = \lim_{z \downarrow 0} E(Y_i | MV_i = z, F_i, NI_i) - \lim_{z \uparrow 0} E(Y_i | MV_i = z, F_i, NI_i)$$

$$\Delta_F = E(\beta_i | MV_i = 0, F_i = 1, NI_i = 1) - E(\beta_i | MV_i = 0, F_i = 1, NI_i = 0)$$

$$\Delta_M = E(\beta_i | MV_i = 0, F_i = 0, NI_i = 1) - E(\beta_i | MV_i = 0, F_i = 0, NI_i = 0)$$

where

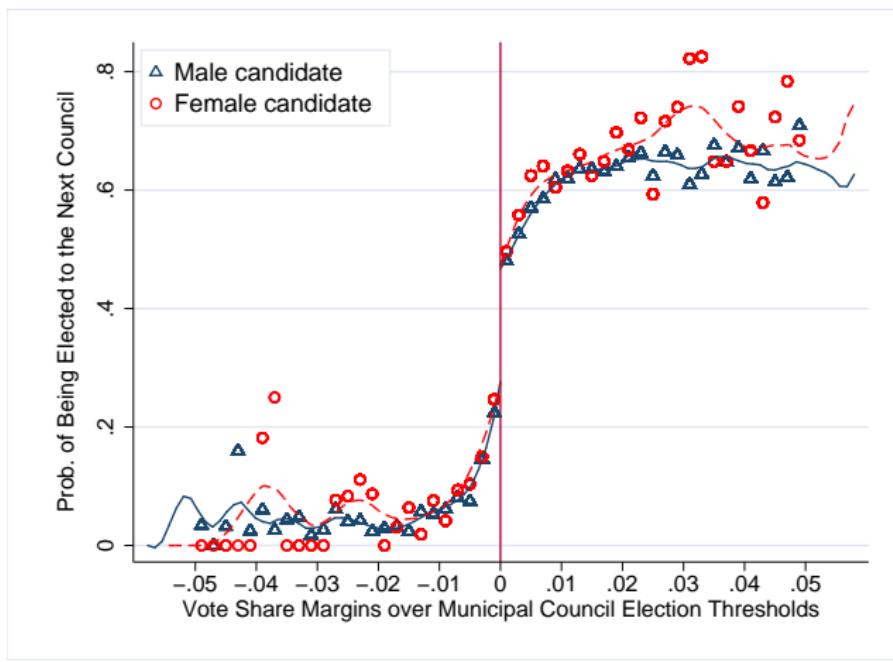
F_i : binary variable indicating female or not

NI_i : binary variable indicating newcomer or otherwise

Diff-in-Diff of IA: $\Delta_F - \Delta_M$

Hahn, Todd & van der Klaauw (2001); Lee & Lemieux (2010); Porter (2013); Calonico, Cattaneo & Titiunik (2014a, 2014b)

Probability of Being Elected to Municipal Council by Vote Share Margin over Election Threshold



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Non-parametrically identified:

$$E(\beta_i | MV_i = 0, F_i, NI_i) = \lim_{z \downarrow 0} E(Y_i | MV_i = z, F_i, NI_i) - \lim_{z \uparrow 0} E(Y_i | MV_i = z, F_i, NI_i)$$

$$\Delta_F = E(\beta_i | MV_i = 0, F_i = 1, NI_i = 1) - E(\beta_i | MV_i = 0, F_i = 1, NI_i = 0)$$

$$\Delta_M = E(\beta_i | MV_i = 0, F_i = 0, NI_i = 1) - E(\beta_i | MV_i = 0, F_i = 0, NI_i = 0)$$

where

F_i : binary variable indicating female or not

NI_i : binary variable indicating newcomer or otherwise

Diff-in-Diff of IA: $\Delta_F - \Delta_M$

Hahn, Todd & van der Klaauw (2001); Lee & Lemieux (2010); Porter (2013); Calonico, Cattaneo & Titiunik (2014a, 2014b)

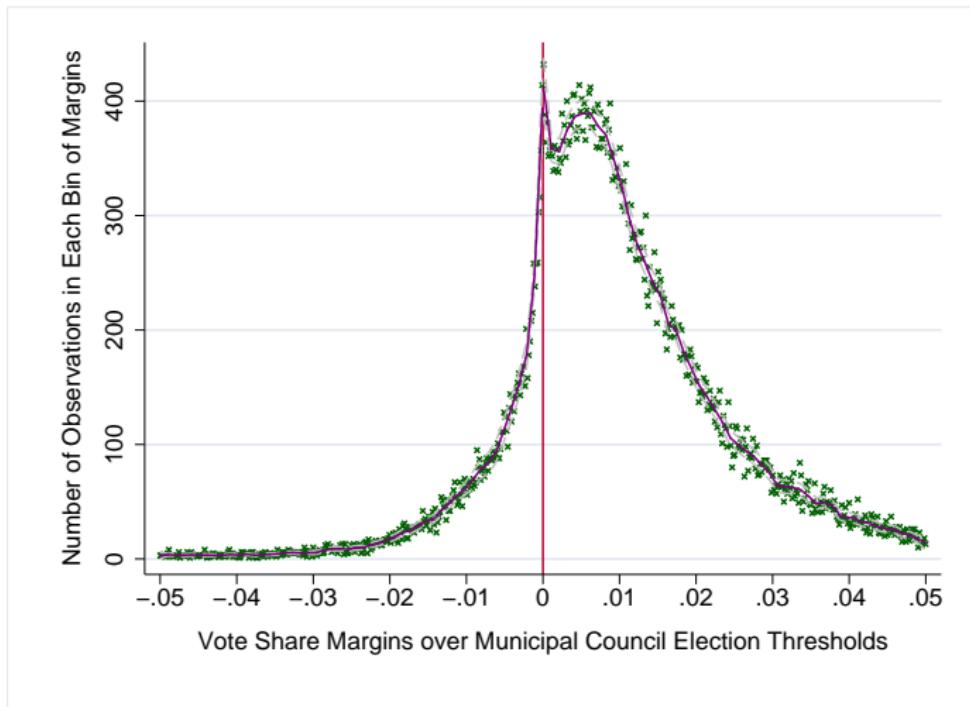
Testing Stochastic Dominance

- Kolmogorov-Smirnov statistic (Barrett & Donald, 2003)
 - + random permutation of genders within a race (Fisher, 1935)
- G_M FoSD G_F rejected at 1% level of significance;
- G_F FoSD G_M not rejected at any level of significance,

where

- ▶ G_M : distribution of the normalized rank of male candidates;
- ▶ G_F : distribution of the normalized rank of female candidates;
- ▶ FoSD: first order stochastically dominates.

McCrary Density Test



Notes: Each scatter point represents the number of observations (y-axis) for each bin of vote share margins (x-axis).

A Simple Model of Political Selection

- Uncertain state and right policy.
- Asymmetry of information between politicians and voters.
- Voters observe outcomes but not type of politicians.
- Voters beliefs, possibly biased, are updated over political tenure.
- Incumbency advantages positively correlate with the biased or unbiased beliefs about how likely the politician has a good type.
- Built on Besley (2005)

Set-up

- Two possible states in each period: $s \in \{0, 1\}$
- Two possible types of politicians: $C \in \{0, 1\}$
- Two possible actions to be chosen by incumbent: $a \in \{0, 1\}$
- $Pr(s = 0) = p > \frac{1}{2}$
- $Pr(C = 1) = \pi_0$, the subjective belief of which is π

$$Pr(a = s | C = 1) = 1, \quad s = 0, 1$$

$$Pr(a = 1 | C = 1) = 1, \quad s = 0, 1$$

Timeline

There are three periods:

- Period 0:** Nature selects the type of incumbent politician.
- Period 1:** The incumbent chooses the action. Voter observe utility but not the state or the action of the incumbent. Voters then vote for re-election or a randomly chosen alternative.
- Period 2:** The newly elected incumbent chooses an action for period 2.

Voter Preference

In each period, voter's utility is one if incumbent action equals to state and zero otherwise, i.e.

$$u = s \cdot a + (1 - s)(1 - a)$$

Voters' subjectively expected utility in Period 2

- If $u = 1$ in Period 1 and re-elected the incumbent:

$$V_1 = \frac{\pi}{p + (1 - p)\pi} + \left[1 - \frac{\pi}{p + (1 - p)\pi}\right] (1 - p)$$

- If $u = 0$ in Period 1 and re-elected the incumbent:

$$V_0 = 1 - p$$

- Electing a randomly chosen politician:

$$\bar{V} = \pi + (1 - \pi)(1 - p)$$

Popularity Shocks

- An incumbent is subject to an unpopularity shock, which is costing voters ϵ to vote for the incumbent.
- $\epsilon \sim F(x)$
- Since $V_1 > \bar{V} > V_0$ the re-election probability for an incumbent given voter utility u in Period 1 is:

$$R_1 = Pr(V_1 - \epsilon > \bar{V}) = F\left(\frac{\pi p}{p + (1-p)\pi}\right) \quad \text{if } u = 1$$

$$R_0 = Pr(V_0 - \epsilon > \bar{V}) = F(-p\pi) \quad \text{if } u = 0$$

Inc incumbency Advantage

- Let the incumbency advantage (IA) be the difference of election probabilities between incumbent and non-incumbent:

$$IA = (2R_1 - 1)[\pi_0 + (1 - \pi_0)p] + (2R_0 - 1)[(1 - \pi_0)(1 - p)]$$

- Assume that $\epsilon \sim U[-\frac{1}{2}, \frac{1}{2}]$, then

$$IA = \frac{2\pi p}{p + (1 - p)\pi} [\pi_0 + (1 - \pi_0)p] - 2p\pi[(1 - \pi_0)(1 - p)]$$

Proposition 1

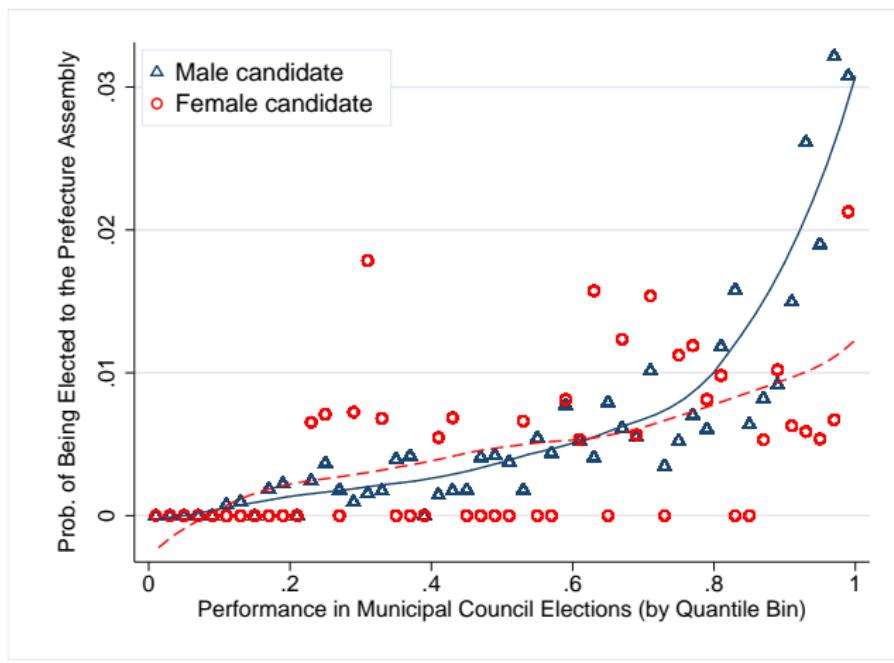
$$\textcircled{1} \quad \frac{\partial IA}{\partial \pi_0} > 0$$

$$\textcircled{2} \quad \frac{\partial IA}{\partial \pi} > 0 \text{ if } \pi \leq \pi_0$$

- Data reject the second part.
- Incumbency seems to reveal politician types directly rather than to signal types.
- But statistical discrimination is still inconsistent with the data.

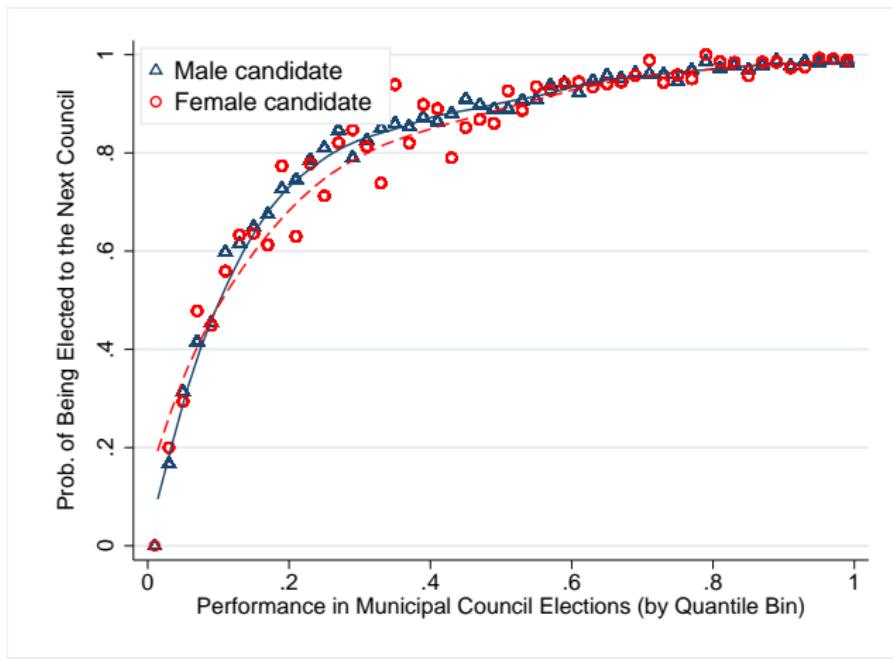
▶ Back to Empirical Strategy

Probability of Being Elected to Prefecture Assembly by Performance in the Last Council Election



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Probability of Being Elected to Municipal Council by Performance in the Last Council Election - Conditional on Running in the Next Election



Notes: Each scatter point represents an average re-running rate of candidates over a quantile bin with a width of 0.02.

Future Work

- Incumbency on ranking in the next elections
- Heterogeneity of voter biases across municipalities
- Effects of female representation on local policies