Woman Reserved Seats and Female Status in Taiwan

NTU Brownbag Seminar

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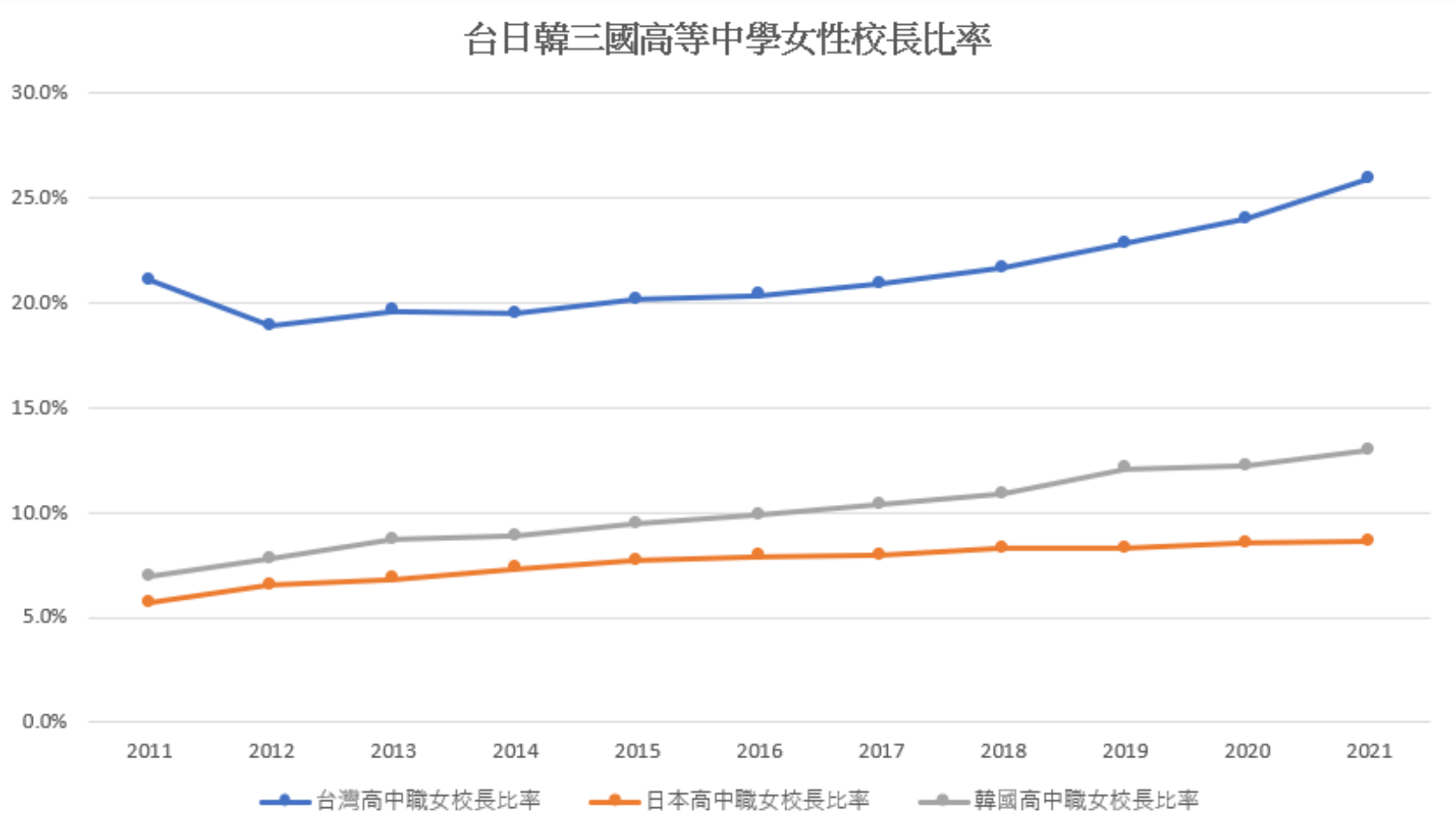
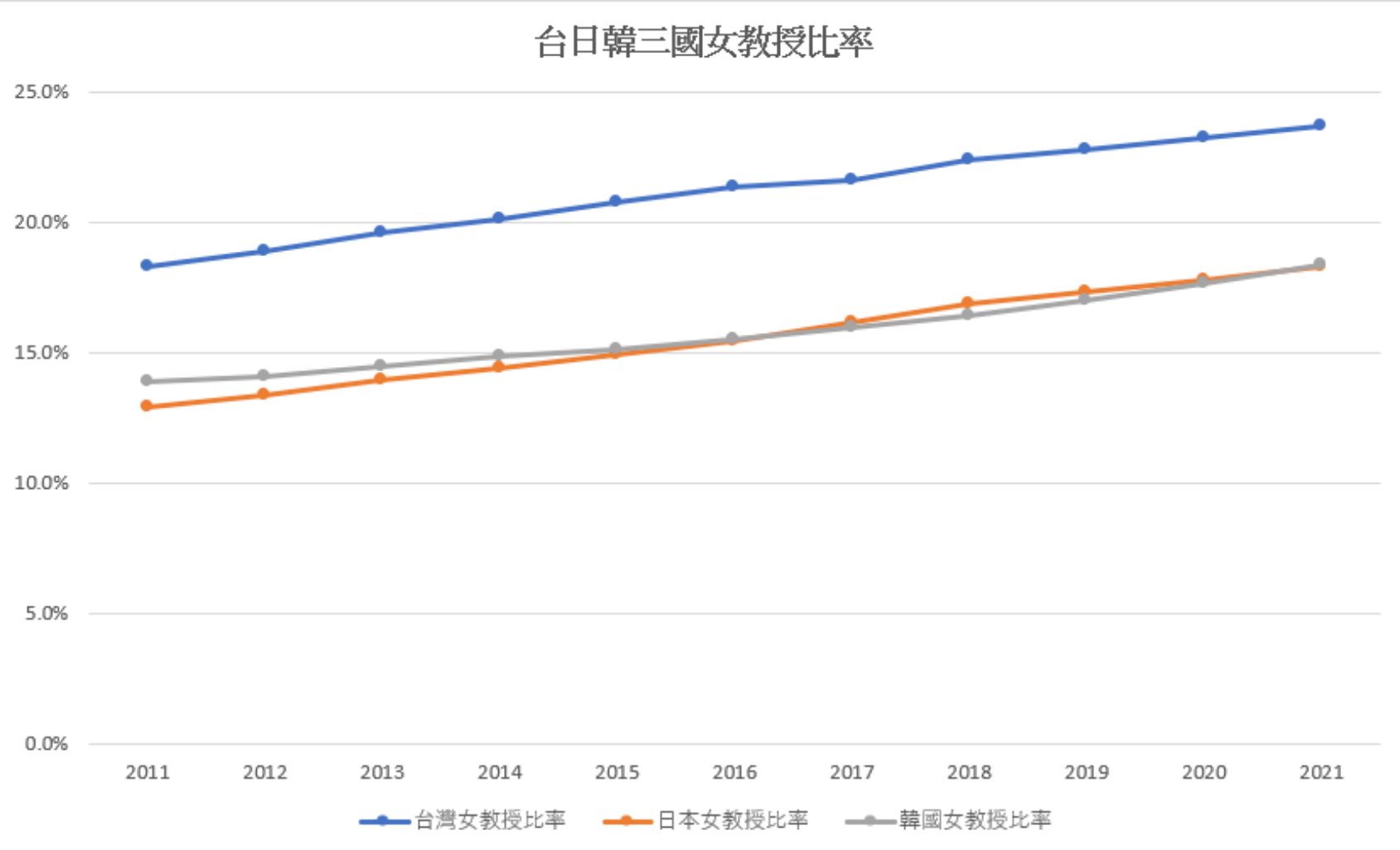
Motivation

Taiwanese women have a relatively well socioeconomic status:

- Gender Gap Index: ranked 36 globally
  - 100 for South Korea
  - 117 for Japan
- > 40% female legislators: close to Scandinavian countries
  - 9% in South Korea
  - 10% in Japan


台日韓三國高等中學女性校長比率
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
台灣高中職女校長比率
日本高中職女校長比率
韓國高中職女校長比率



What factors are driving this great gap between Taiwan, Japan and South Korea?

Woman Reserved Seats in Taiwan

- Unique institution among global democracies
- Implemented since 1946, at national legislators and county councilors elections
- For every 4 political seats (or 5 before 1999), 1 seat is reserved for female candidates.
- 14% ~ 25% female councilor for constituencies with ≥ 4 seats
- Elected man with lowest vote share get replaced by unelected woman with highest vote share.

Goal

This paper

Examine the casual impact of female political representativeness on son preference, and the potential mechanisms.

- A changing and prominent norm of Taiwanese society
- An important component of gender attitudes

Data on Political Representativeness

- Councilor election result from Central Election Committee
- Election years: 1994, 1998, 2002, 2006

Treatment: % Female Elected

$$\%\ \text{Female Elected}_{td} = \frac{\#\ \text{Female Elected}_{td}}{\#\ \text{Total Seats}_{td}}$$

for year t, constituency (electoral district) d

Outcome

Propensity of having 3rd child

$$\text{Child3}_{itcd} = 1\{\text{3rd child is born at time } t\}$$

for mother i, living in county c, constituency d

- An indicator for son preference
  - Strong son preference at 3rd child
  - Mothers with 2 daughters would like to have 3rd child
- Data gathered from MOI birth record
  - Panel data from 1994 — 2006, each observation linked to most recent electoral result with 1 year lag
  - Sample consists of mothers with 2 children, not yet having 3rd

Strong son preference at 3rd child

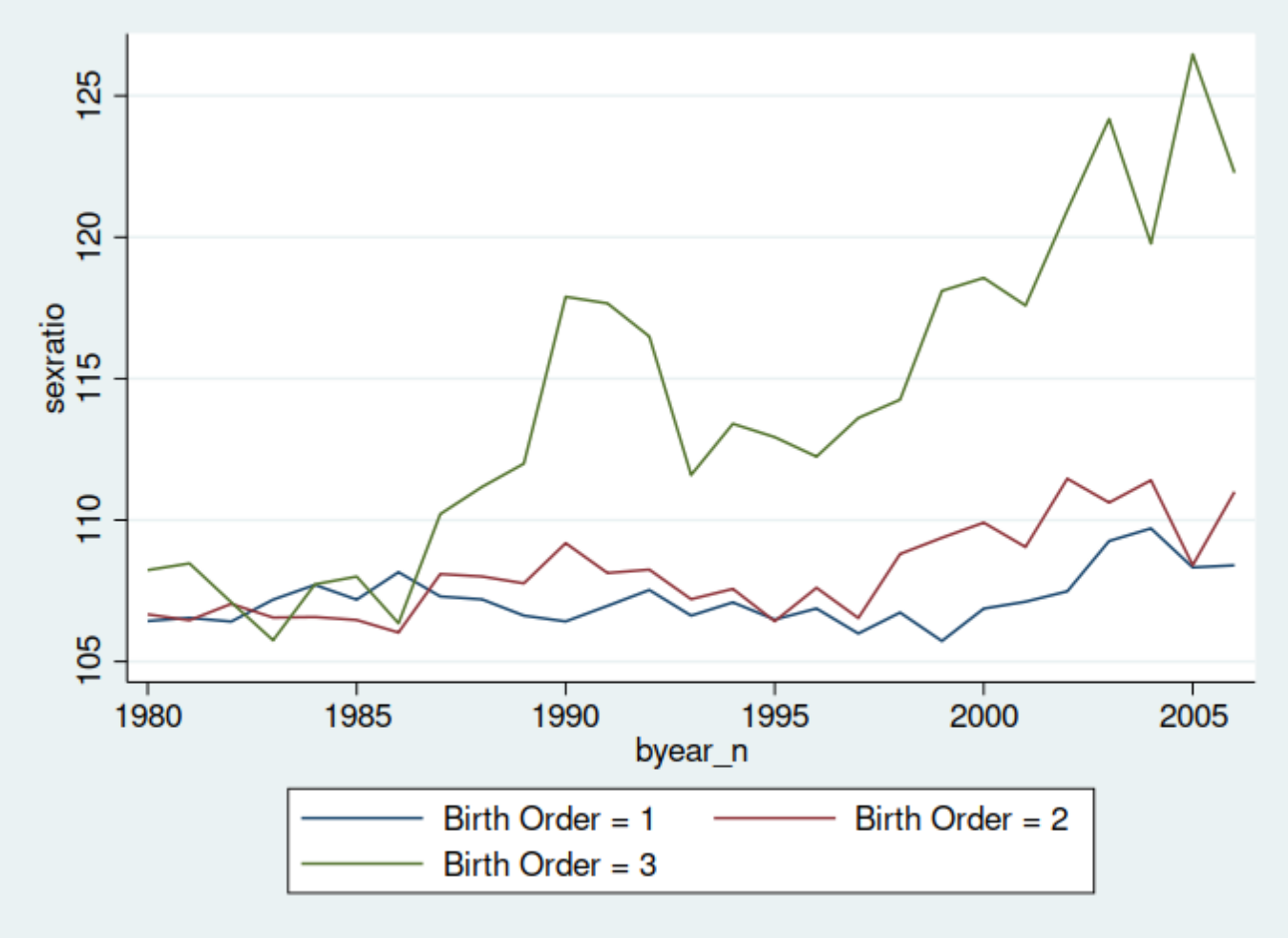


Figure 1: Time Trend of Sex Ratio, by Birth Order

Mothers with 2 daughters would like to have 3rd child

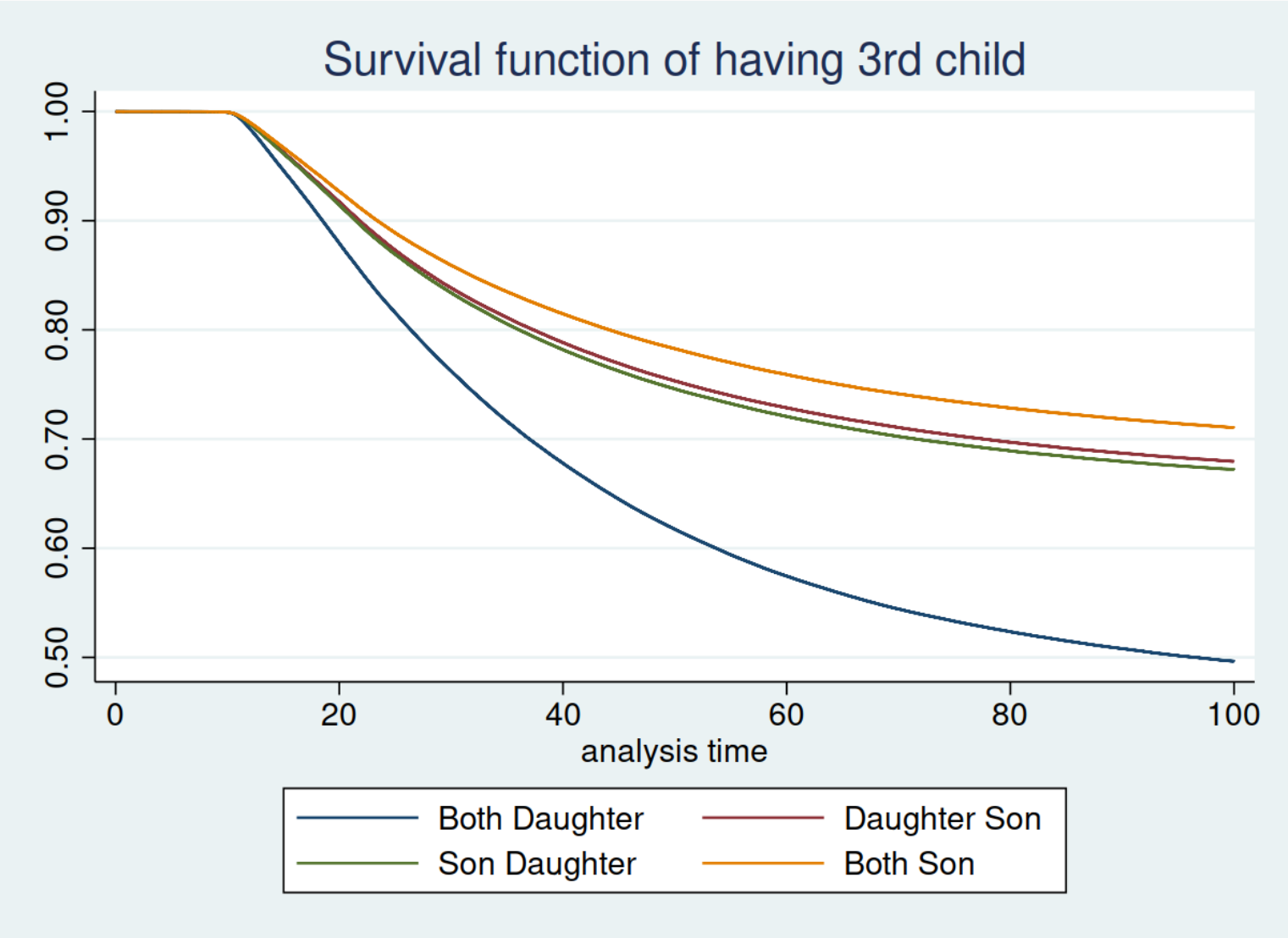


Figure 2: Survival Function Estimate for 3rd Parity Fertility

Endogeneity

- Reverse causality: Gender attitudes might have impact on election result
- Instrumental variable approach is used to deal with endogeneity.

Instrumental Variable Design

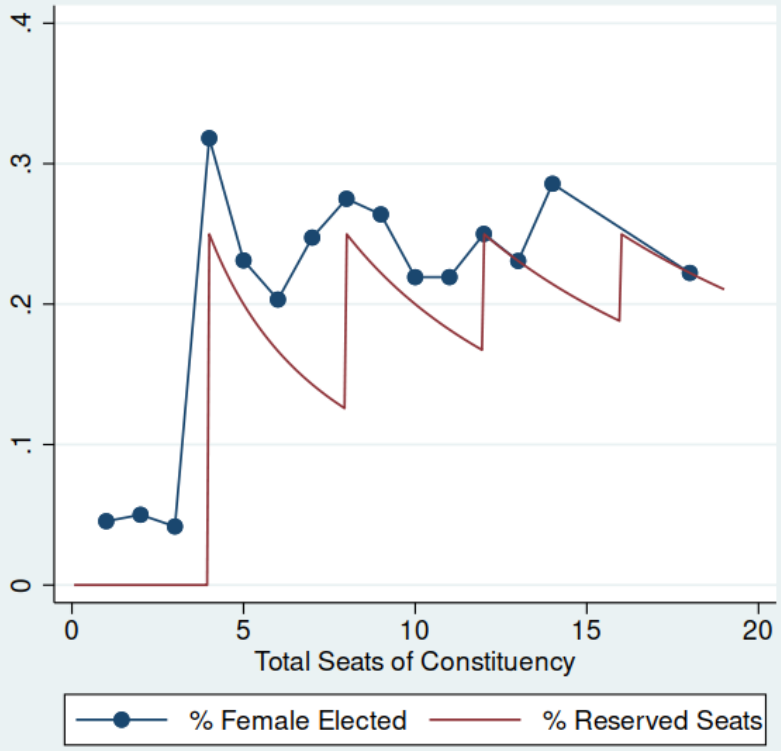
Source of Exogenous Variation: Woman Reserved Seats

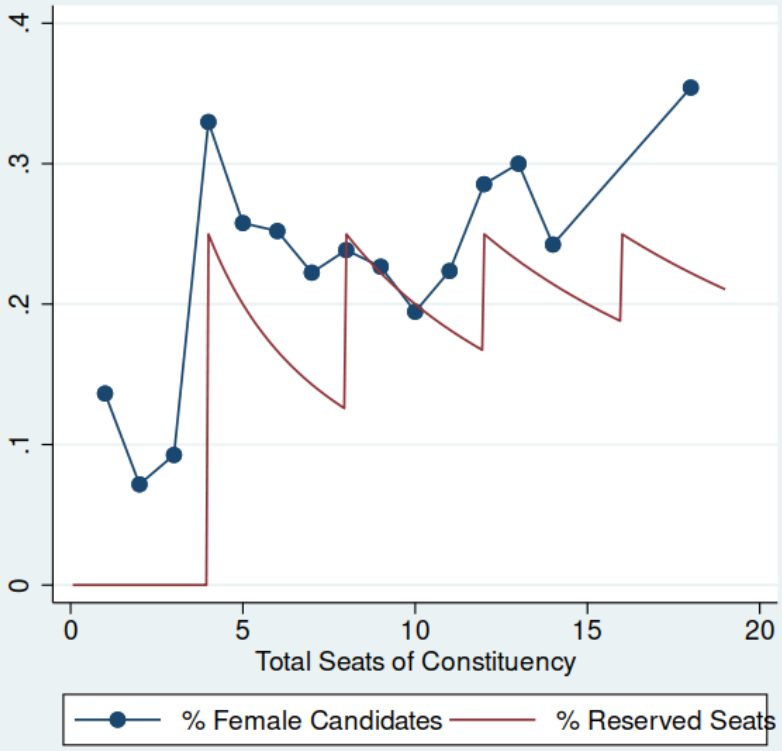
Define instrument as

$$\% \text{ Reserved Seats}_{td} = \frac{\text{\# Reserved Seats}_{td}}{\text{\# Total Seats}_{td}}$$

which is mostly determined by population size.

However, since the allocation rule of seats is non-linear, even after controlling the population size, variation of IV is still rich.





- IV highly correlated with % female elected.
- However, IV correlated not only with female elected but also candidates.
- 1st stage and reduced form estimates are presented throughout this paper.

Regression Specification

First Stage

$$\text{Treatment}_{itcd} = \alpha + \beta \% \text{ Reserved Seats}_{tcd} + \mathbf{X}_i \Gamma + \mathbf{X}_{tcd} \rho + \delta_t + \delta_c + \varepsilon_{itcd}$$

Reduced Form

$$\text{Child3}_{itcd} = \alpha + \beta \% \text{ Reserved Seats}_{tcd} \times \text{Sex Composition}_i + \mathbf{X}_i \Gamma + \mathbf{X}_{tcd} \rho + \delta_t + \delta_c + \varepsilon_{itcd}$$

First Stage

Table 1: 3rd Child Fertility Estimates: First Stage

	1	2
	% Female Elected	% Female Candidates
% Reserved Seats	.898***	.716***
	(0.074)	(0.060)
Mean Dep. Var.	0.202	0.191
Obs.	11681525	11419516
Adj. R-square	0.402	0.423

Clustered (election-township level) standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table 2: 3rd Child Fertility Estimates: Reduced Form

	1	2	3	4	5
	Full Sample	High School	Non-HS	Urban	Non-Urban
(β_0) % Reserved Seats	-.0325***	-.0336***	-.0357***	-.0574***	-.0262***
	(0.0054)	(0.0062)	(0.0061)	(0.011)	(0.0061)
(β_1) Daughter Son × % Reserved Seats	.0353***	.0331***	.0424***	.0586***	.0305***
	(0.0050)	(0.0059)	(0.0058)	(0.011)	(0.0056)
(β_2) Son Daughter × % Reserved Seats	.0357***	.0376***	.0401***	.0658***	.0302***
	(0.0050)	(0.0059)	(0.0057)	(0.011)	(0.0054)
(β_3) Both Son × % Reserved Seats	.0400***	.0431***	.0430***	.0746***	.0337***
	(0.0058)	(0.0067)	(0.0065)	(0.013)	(0.0064)
Mean	0.0215	0.023	0.0202	0.0148	0.0237
Obs.	11681525	5610905	6070620	2864758	8816767
Adj. R-square	0.0257	0.0249	0.0269	0.0172	0.0271
p-value $H_0 : \beta_0 + \beta_1 = 0$	0.378	0.881	0.051	0.828	0.241
p-value $H_0 : \beta_0 + \beta_2 = 0$	0.294	0.262	0.197	0.132	0.262
p-value $H_0 : \beta_0 + \beta_3 = 0$	0.018	0.008	0.035	0.003	0.043

Clustered (election-township level) standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table 3: 3rd Child Sex Ratio Estimates: Reduced Form

	1	2	3	4	5
	Full Sample	High School	Non-HS	Urban	Non-Urban
(β_0) % Reserved Seats	.0926***	0.0605	.0836*	.243**	.0865***
	(0.030)	(0.038)	(0.044)	(0.11)	(0.031)
(β_1) Daughter Son × % Reserved Seats	-.127***	-.122**	-0.0772	-0.0893	-.128***
	(0.040)	(0.056)	(0.059)	(0.13)	(0.042)
(β_2) Son Daughter × % Reserved Seats	-.0742*	0.0149	-.105*	-0.148	-0.0633
	(0.041)	(0.057)	(0.059)	(0.14)	(0.043)
(β_3) Both Son × % Reserved Seats	-.0853**	-.131**	0.0184	-0.127	-.0798*
	(0.043)	(0.057)	(0.059)	(0.14)	(0.045)
Mean	0.539	0.547	0.53	0.545	0.537
Obs.	251671	129151	122520	42386	209285
Adj. R-square	0.00484	0.00772	0.00204	0.00597	0.00461
p-value $H_0 : \beta_0 + \beta_1 = 0$	0.253	0.184	0.881	0.179	0.187
p-value $H_0 : \beta_0 + \beta_2 = 0$	0.564	0.116	0.644	0.459	0.484
p-value $H_0 : \beta_0 + \beta_3 = 0$	0.82	0.133	0.021	0.403	0.844

Clustered (election-township level) standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Mechanism Discussion

Benefit-Cost Hypothesis

- Female councilors delivering beliefs of promising future
- Both husband and wife are satisfied with daughters due to improved career prospect
- Daughters are considered more “valuable”
- **Test**: Gender gap in health investment

Intrahousehold Bargaining Hypothesis

- Wife, not husband, is susceptible to the increase of female councilor
- She has a preference for less children
- When women are gaining awareness in participating household decisions, her preference are more likely to be realized.
- **Test**: Gender division in household decision making

Test for Benefit-Cost Hypothesis

Is there a reduction in gender gap of neonatal mortality?

NHRI Mortality Record

- Outcome: Neonatal mortality
- Period: 2000 - 2008
- Boys and girls aged under 3
- Outcome = 1 if he/she dies under 3 years old, 0 otherwise.

Neonatal Mortality Estimates

Table 4: Linear Probability Estimates of Neonatal Mortality (Age ≤ 3)

	1	2
	Boys	Girls
% Reserved Seats	0.000872*	0.00104**
	(0.000487)	(0.000489)
# Birth Order=2 × % Reserved Seats	-0.00273***	-0.00254***
	(0.000728)	(0.000795)
# Birth Order=3 × % Reserved Seats	-0.00357**	-0.00303**
	(0.00146)	(0.00147)
# Birth Order=2	0.000821***	0.000710***
	(0.000142)	(0.000152)
# Birth Order=3	0.00120***	0.00124***
	(0.000281)	(0.000279)
Mean Dep. Var.	0.00155	0.00134
Observations	2884286	2633899
Adj. R-square	0.00140	0.00124

Clustered (election-township level) standard errors in parentheses

Joint Hypothesis Test p-value = 0.906

Test for Intrahousehold Bargaining Hypothesis

Survey on Social Development Trends, SSDT

- Outcome: Household decision making
  - Allocation of daily expenditure
  - Parenting
  - Saving & investment
  - Allocation of housework
- Period: 1998, 2002
- Sample limited to married individuals aged between 16 to 45

Taiwan Social Change Survey, TSCS

- Outcome:
  - *In order to continue the patrilineal family, it's important to have at least one son*
  - Ideal number of children
- Period: 2001, 2006

Household Decision Making Estimates

Table 5: Linear Probability Estimates of Bargaining Power, SSDT

	1	2	3	4	5
	Alloc. Daily Expen.	Parenting	Saving & Investment	Alloc. Houseworks	PCA
Reserved Seats %	-0.0849	-0.0416	-0.123	-0.135**	-0.574*
	(0.112)	(0.0827)	(0.0863)	(0.0585)	(0.345)
Woman × Reserved Seats %	0.184***	0.0296	0.234***	0.0783*	0.669***
	(0.0686)	(0.0569)	(0.0651)	(0.0473)	(0.258)
Woman	0.0161	0.0232**	0.0125	0.00684	0.0790*
	(0.0118)	(0.00944)	(0.0106)	(0.00907)	(0.0427)
Age, Edu Control	Yes	Yes	Yes	Yes	Yes
Log-Population Control	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes
Mean	0.833	0.882	0.895	0.938	0.158
Observations	17358	16384	17013	17358	16039

Clustered (election-township level) standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Table 6: Logistic Estimates of Bargaining Power, SSDT

	1	2	3	4
	Alloc. Daily Expen.	Parenting	Saving & Investment	Alloc. Houseworks
Woman decides over man decides				
Reserved Seats %	0.46	0.123**	0.457	0.0806**
	(0.432)	(0.127)	(0.512)	(0.0802)
Woman × Reserved Seats %	4.500***	8.060***	4.681*	3.879
	(2.568)	(6.153)	(3.798)	(3.245)
Woman	1.193*	1.055	1.448**	1.146
	(0.117)	(0.111)	(0.224)	(0.183)
Mutually decides over man decides				
Reserved Seats %	0.372	0.220*	0.729	0.0922**
	(0.310)	(0.189)	(0.653)	(0.0978)
Woman × Reserved Seats %	3.816***	3.809**	2.75	3.908*
	(1.712)	(2.375)	(1.870)	(3.082)
Woman	1.051	1.126	1.335**	1.061
	(0.0767)	(0.0875)	(0.162)	(0.161)
Observations	17358	16384	17013	17358

Exponentiated coefficients;

Clustered (on election-township level) standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Self-reported Son Preference Estimates

Table 7: Birth Preference Estimates, TSCS

	Important to have at least one son			Number of children willing to have		
	1	2	3	4	5	6
	All age	Age 16-45	Age > 45	All age	Age 16-45	Age > 45
Reserved Seats %	-0.0813	0.23	-0.526	-0.0141	-0.405	0.349
	(.264)	(.313)	(.318)	(.357)	(.42)	(.473)
Woman × Reserved Seats %	-.494**	-0.384	-.626*	-0.249	-0.0278	-0.383
	(.2)	(.288)	(.331)	(.424)	(.392)	(.633)
Woman	-.0671**	-.0993**	-0.00758	0.0547	0.029	0.0504
	(.0305)	(.0463)	(.0505)	(.0834)	(.0757)	(.122)
Age, Edu Control	Yes	Yes	Yes	Yes	Yes	Yes
Log-Population Control	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.46	0.356	0.594	2.38	2.21	2.55
Observations	3697	2077	1620	4049	2077	1972
Adj. R-square	0.131	0.0567	0.123	0.0854	0.0246	0.059

Clustered (election-township level) standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

Conclusions

- Increasing female political representativeness has an impact on family birth decision
- 3rd parity fertility decreased for mothers without son.
- Female gaining more awareness in decision making which affects joint decision (including birth) outcome