

# Women as Policy Makers: Evidence from a Randomized Policy Experiment in India

Chattopadhyay and Duflo (Econometrica 2004)

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# Introduction

## Research Question

Does political reservation for women has an impact on policy decisions?

## Motivation

- ▶ Women are under-represented in all political positions.
- ▶ There is evidence that women and men have different policy preferences.
- ▶ Political reservation for women is a popular policy addressing this problem, but little is known about its causal impact, both theoretically and empirically.

# This paper

- ▶ Exploits a natural experiment in India to estimate casual effects of reservation for women.
  - ▶ Using data from West Bengal and Rajasthan, results suggest that reservation for women move policy choices closer to women's preferences.
- ▶ Evidence from the analysis is consistent with a “Citizen Candidate” framework, extended to account for candidate's identity.
  - ▶ the model is based largely on Besley-Coate (1997)
- ▶ Results are consistent with related papers (Pande (2003), Levitt (1996))

# Overview

1. Institutional Background and Policy Reservation in India
2. Model
3. Empirical Strategy
4. Results
5. Robustness Checks
6. Conclusions

# Institutional Background and Policy Reservation in India

- ▶ Institutional background
  - ▶ The 73rd amendment to the Constitution of India (1992) established nationwide the Panchayat system.
  - ▶ The Panchayat is a system of three-tiered local governance: village level council (Gram Panchayat), block level council (Panchayat Samiti) and district level council (Zilla Parishad). Members of each are elected by the people.
  - ▶ Each Gram Panchayat (GP) encompasses between 5 and 15 villages and have jurisdiction over rural areas only.
  - ▶ The GP council elects among its members a Pradhan and an Uda-Pradhan.
  - ▶ Responsibilities of the GP: administer local infrastructure and identify targeted welfare recipients. Source of financing is the state and it has complete flexibility in allocating these funds.
  - ▶ The Panchayat is required to organize two meeting per year, called “Gram Samsad” (meetings of villagers and village heads in which all voters may participate).

# Institutional Background and Policy Reservation in India

- ▶ Policy Reservation for Women
  - ▶ The Amendment to the Constitution of India in 1992 also provided that one-third of the seats in all Panchayat councils, as well as one-third of the Pradhan positions, must be reserved for women.
  - ▶ Seats and Pradhan's positions were also reserved for Scheduled Castes (SC) and Scheduled Tribes (ST); which are two disadvantaged minorities in India.
  - ▶ In each state, the GPs where the office of Pradhan was to be reserved for a woman were randomly selected.

# Institutional Background and Policy Reservation in India

## FRACTION OF WOMEN AMONG PRADHANS IN RESERVED AND UNRESERVED GP

	Reserved GP (1)	Unreserved GP (2)
<i>West Bengal</i>		
Total Number	54	107
Proportion of Female Pradhans	100%	6.5%
<i>Rajasthan</i>		
Total Number	40	60
Proportion of Female Pradhans	100%	1.7%

# Model setup

- ▶ Each citizen has policy preference  $\omega_j$ , distributed over the interval  $[0, 1]$
- ▶ Women over  $[0, W]$  men over  $[M, 1]$ ;  $M < W$  is possible
- ▶ Women and men has running costs  $\delta_w$  and  $\delta_m$ :  $\delta_w > \delta_m$
- ▶ Assume common knowledge (villagers know each other well)
- ▶ 3-stage game:
  1. Citizens decide whether to run
  2. Citizens vote for candidates, voting is strategic
  3. Policy of the winning candidate is implemented



# Model - Proposition 1

- ▶ A citizen's utility is  $u_{ij} = -|x_j - \omega_i|$  and a candidate's utility is  $u_{ij} = -|x_j - \omega_i| - \delta_j$
- ▶ Default policy option is  $\mu$ , preferred by the local elite/lobbies;  $\mu > m$  where  $m$  is the median voter's preference
- ▶ The elected candidate implements policy  $x_j = \alpha\omega_j + (1 - \alpha)\mu$

## Proposition 1

*There is no equilibrium where a woman runs in the absence of reservation if:*

1.  $\delta_w - \frac{1}{2}\delta_m > \mu - m$
2.  $\delta_w > m - (1 - \alpha)\mu$

# Proposition 1 - Proof

## One-candidate equilibria

- ▶ A women  $j$  runs unopposed if  $-|x_j - w_j| - \delta_w \geq -|\mu - w_j| \Leftrightarrow \mu - x_j \geq \delta_w$ , where  $x_j = \alpha w_j + (1 - \alpha)\mu$ . The most “pro-male” outcome implemented would be  $\tilde{x}_j = \mu - \delta_w$ .
- ▶ A men  $k$  would challenge this female candidate if  $-|x_k - w_k| - \delta_m \geq -|\tilde{x}_j - w_k| \Leftrightarrow x_k - \tilde{x}_j \geq \delta_m$  and  $x_k - m < m - \tilde{x}_j$ .
- ▶ The most “pro-female” man willing to challenge the woman  $\tilde{x}_j$  would implement  $\tilde{x}_k = \tilde{x}_j + \delta_m = \mu - \delta_w + \delta_m$ .
- ▶ This man will win for sure if  $\tilde{x}_k - m < m - \tilde{x}_j \Leftrightarrow \mu - m < \delta_w - \frac{1}{2}\delta_m$ .

# Proposition 1 - Proof

## Two-candidate equilibria

- ▶ 2 candidates must have equal chance of winning (symmetrical outcomes around  $m$ )
- ▶ The outcome implemented by the woman 0 is  $(1 - \alpha)\mu \Rightarrow$  largest possible distance b/w two policies implemented is  $2m - 2(1 - \alpha)\mu$ .
- ▶ A woman runs against another candidate if  $\delta_w < \frac{1}{2}(2m - 2(1 - \alpha)\mu)$ .  
 $\Rightarrow$  No women run against another candidate if  $\delta_w > m - (1 - \alpha)\mu$ .
- ▶ Nonclumping assumption and Abstinance of Indifferent Voters restriction ensures no pure strategy equilibria with more than two candidates.

# Model - Lemma 1

## Lemma 1

*If  $\delta_w > \mu - (1 - \alpha)\mu \Leftrightarrow \delta_w > \alpha\mu$ , there is no equilibrium in which a (female) candidate runs under the reservation regime.*

## Proof.

- ▶ Only women can run under reservation.
- ▶ If the woman 0 runs unopposed, she wins for sure.  
 $\Rightarrow$  runs if  $\mu - (1 - \alpha)\mu \geq \delta_w \Leftrightarrow \delta_w < \alpha\mu$
- ▶ If woman 0 does not run, no other women would run either.
- ▶ This condition is stronger than condition 1.2, so no women run in a 2-women equilibrium (w/ res) either.



*Note:* This condition also guarantees no women runs without reservation.

## Model - Proposition 2

### Proposition 2

1.  $\delta_w > \alpha\mu$
2.  $\mu - [\alpha M + (1 - \alpha)\mu] \geq \delta_m$
3.  $\mu > \max\{m + \frac{1}{2}\delta_m, 2m - [\alpha M + (1 - \alpha)\mu]\},$

*If the above hold, the reservation leads to an unambiguous loss in the utility of the median voter and that of women.*

## Model - Proposition 2

Proof.

- ▶ In Besley-Coate (1997), the range of outcome in one-candidate equilibria is  $[m - \frac{1}{2}\delta, m + \frac{1}{2}\delta]$ .

Assume conditions 1 and 2.

**No reservation:** no women runs and at least one man (the most “pro-female” man) will run.

- ▶ If 1 (male) candidate runs unopposed, the most “pro-male” possible outcome is  $m + \frac{1}{2}\delta_m$
- ▶ If 2 (male) candidates run: the most “pro-male” possible outcome is  $2m - [\alpha M + (1 - \alpha)\mu]$

**With reservation:** no women run so  $\mu$  is implemented.

If condition 3 holds, reservation decreases the utility of the median voter and of women.



# Model - Proposition 3

## Proposition 3

*If  $\mu - (1 - \alpha)\mu \geq \delta_w$  and conditions in Proposition 1 hold, then reservation:*

- 1. always raises the utility of the median female voter if*  
$$\alpha M + (1 - \alpha)\mu \geq \min\{m + \frac{1}{2}\delta_w, \alpha W + (1 - \alpha)\mu, \mu - \delta_w\}$$
- 2. always raises the utility of the median voter and of the median female voter if*  
$$\alpha M + (1 - \alpha)\mu \geq 2m - \max\{(1 - \alpha)\mu, m + \frac{1}{2}\delta_w\}$$

## Model - Proposition 3

### Proof.

- ▶ Proposition 1 holds implies no woman runs against another woman  $\Rightarrow$  only one-female candidate equilibria are possible under reservation.
- ▶ The range of possible outcomes in equilibrium:
  - ▶ Lower bound:  $\max\{(1 - \alpha)\mu, m - \frac{1}{2}\delta_w\}$
  - ▶ Upper bound:  $\min\{m + \frac{1}{2}\delta_w, \alpha W + (1 - \alpha)\mu, \mu - \delta_w\}$
- ▶ If condition 3.1 holds, the most “pro-female” outcome implemented by a man w/o reservation is to the right of the most “pro-male” outcome implemented by a woman under reservation.
- ▶ If, in addition, condition 3.2 holds, the most “pro-female” outcome implemented by a man w/o res. is further from  $m$  than is the most “pro-male” outcome implemented by a woman under res.



## Remarks from this Analysis

- ▶ If  $[0, W]$  and  $[M, 1]$  do not have a large overlap, then 3.1 is more likely to hold.
- ▶ If lobbying power is large ( $\mu$  high), 3.2 is more likely to hold
- ▶ If Proposition 1 fails to hold, no women contest without reservation and the effect of reservation is unclear.
- ▶ If it does hold, reservation counters the force of ex post lobbying and makes the range of equilibria generally more “pro-woman” and may make the entire population better off.

# Limitations of the Model

- ▶  $\mu$  may be influenced by reservation
  - ▶ reservation may lower the cost of speaking for female citizens  
→ move  $\mu$  to the left → reinforce model predictions
- ▶ The ability to enforce own preference  $\alpha$  is fixed across candidates. If  $\alpha$  varies:
  - ▶ w/o res: strong women (and strong men) would run
  - ▶ w/ res: weaker women with strong pro-female preference will likely to contest and implement similar policies
  - ▶ candidate characteristics become endogenous to reservation → unobserved preferences may bias estimates
- ▶ Assumes myopia and ignores incentives from re-election, which can arise in a dynamic setting.  
→ control for different dynamic incentives using exogenous variation generated by rotation of reservation

# Testing the Empirical Predictions

- ▶ Testable prediction: Policy outcomes in reserved GPs will be closer to what women want than to what men want.
- ▶ Mechanism test: The mechanisms involve the selection of women candidates and potential reduction of cost of speaking for women, but not because women are more responsive to complaints.

# Testing the Empirical Predictions

- ▶ Measuring average preferences of women and men:
  - ▶ Use data on formal request and complaints that are brought to the Pradhan.

$$D_i = \left( \frac{n_i^w}{N^w} - \frac{n_i^m}{N^m} \right) \quad (1)$$

$$S_i = \frac{1}{2} \left( \frac{n_i^w}{N^w} + \frac{n_i^m}{N^m} \right) \quad (2)$$

where  $n_i^x$  ( $x = w, m$ ) is the number of requests about good  $i$  made by women or men and  $N^x$  ( $x = w, m$ ) is the total number of request made by women or men.

- ▶  $D_i$  = strength of the difference between women's and men's preferences for a good  $i$ .
- ▶  $S_i$  = strength of the preference in the aggregate population for good  $i$ .

# Testing the Empirical Predictions

- ▶ If the probability of complaining depends only on the cost of complaining and not on the intensity of preferences.  
→ The frequency of complaints is an unbiased estimate of the underlying preferences for a group of voters.
- ▶ In general, this might not be true. And the nature of the complaint could depend on the intensity of the individual's preferences.
  - ▶ The distribution of complainers could depend both on the preferences of the Pradhan and the preferences of the complainer.
  - ▶ Higher complain cost, the requests will reflect more polarized preferences.
  - ▶ Then,  $D_i$  measures women's preferences with error.
- ▶ If the cost of complaining is affected by reservation (it is), can test whether the nature of complaints depend on the intensity of preferences.
  - ▶ If true, there will be a difference in the frequency of requests in reserved and unreserved GPs.

# Data collection

- ▶ Data was collected from two locations: Birbhum in West Bengal and Udaipur in Rajasthan.
- ▶ Survey in all GPs in Birbhum was conducted in two stages (summer of 2000):
  1. Interview with each GP Pradhan: Information about his or her family background, education, previous political experience, political ambitions and activities of the GP since his or her election in May 1998.
  2. Survey of three villages in each GP: two randomly selected and the village in which the GP Pradhan resides. Information about available infrastructure and whether it was built or repair since May 1998, and details about investments in various public goods. Also asked whether women and men of the village had expressed complaints or requests to the GP in the previous six months.

## Data collection

- ▶ For the survey in Udaipur (August 2002-December 2002), they randomly select 100 villages (from a subset of villages covered by a local NGO) and then choose randomly one hamlet (sub-division of a village) per village.
- ▶ They collected similar information about investments and public good provision in a similar length period, 2000-2002.
- ▶ No Pradhan interviews were conducted in Udaipur.
- ▶ They also collect data for both West Bengal and Rajasthan of formal requests or complaints made by villagers to the Panchayat in the six months prior to the surveys.

# Empirical Strategy

- ▶ As GPs were randomly selected to be reserved for women, the empirical strategy is straightforward: the reduced form effect of reservation status is obtained by comparing the means of the outcomes of interest in reserved and unreserved GPs.

$$E[Y_{ij}|R_j = 1] - E[Y_{ij}|R = 0]$$

- ▶ Given that all the reserved GPs have a female Pradhan, and only very few of the unreserved GPs do, this reduced form is very close to the coefficient that one would obtain by using the reservation policy as an instrument for the Pradhan's gender.
- ▶ Standardized investment measure.
  - ▶ For the different categories of goods in both samples they constructed an standardized measure of investment by subtracting the mean in the unreserved sample from the actual measure and then dividing this difference by the standard deviation in the unreserved sample. In this way, generating variables whose scale can be compared across goods.



## Empirical Strategy

- ▶ To test that in reserved GPs, there is more investment in goods mentioned more frequently by women:

$$Y_{ij} = \beta_1 + \beta_2 R_j + \beta_3 D_i \times R_j + \sum_{l=1}^N \beta_l d_{il} + \epsilon_{ij} \quad (3)$$

$$Y_{ij} = \beta_4 + \beta_5 R_j + \beta_6 S_i \times R_j + \sum_{l=1}^N \beta_l d_{il} + \epsilon_{ij} \quad (4)$$

- ▶ To test whether the difference in policy comes from greater responsiveness of women Pradhans to complaints expressed by women in a specific village:

$$Y_{ij} = \beta_7 + \beta_8 R_j + \beta_9 D_i \times R_j + \beta_{10} D_{ij} \times R_j + \beta_{11} S_{ij} \times R_j + \beta_{12} S_{ij} + \beta_{13} D_{ij} + \sum_{l=1}^N \beta_l d_{il} + \epsilon_{ij} \quad (5)$$

# Empirical Strategy

- ▶ In all three specifications  $Y_{ij}$  is the investment in good  $i$  in village  $j$ ,  $R_j$  is a dummy variable that equals one if the village belongs to a GP reserved for women,  $D_i$  is the average difference between the fraction of requests about good  $i$  from women and from men, and  $S_i$  is the average fraction of requests across men and women. And  $d_{ij}$  are good-specific dummies.
- ▶ In specification (3),  $D_{ij}$  is the difference between an indicator for whether issue  $i$  was brought by a woman in village  $j$  and an indicator for whether issue  $i$  was brought by men in village  $j$ . And  $S_{ij}$  is the sum of these two indicators.
- ▶ They expect that  $\beta_3 \geq 0$  and  $\beta_6 \geq 0$ ; and  $\beta_{10} = 0$  and  $\beta_{11} = 0$ .

# Political Participation of Women

EFFECT OF WOMEN'S RESERVATION ON WOMEN'S POLITICAL PARTICIPATION

Dependent Variables	Mean, Reserved GP (1)	Mean, Unreserved GP (2)	Difference (3)
<i>West Bengal</i>			
Fraction of Women Among Participants in the Gram Samsad (in percentage)	9.80 (1.33)	6.88 (.79)	2.92 (1.44)
Have Women Filed a Complaint to the GP in the Last 6 Months	.20 (.04)	.11 (.03)	.09 (.05)
Have Men Filed a Complaint to the GP in the Last 6 Months	.94 (.06)	1.00	.06 (.06)
Observations	54	107	
<i>Rajasthan</i>			
Fraction of Women Among Participants in the Gram Samsad (in percentage)	20.41 (2.42)	24.49 (3.05)	-4.08 (4.03)
Have Women Filed a Complaint to the GP in the Last 6 Months	.64 (.07)	.62 (.06)	.02 (.10)
Have Men Filed a Complaint to the GP in the Last 6 Months	.95 (.03)	.88 (.04)	.073 (.058)
Observations	40	60	

*Notes:* 1. Standard errors in parentheses. 2. Standard errors are corrected for clustering at the GP level in the West Bengal regressions, using the Moulton (1986) formula.

# Issues Raised by Women and Men in the Last 6 Month

	West Bengal					
	Women			Men	Average	Difference
	Reserved (1)	Unreserved (2)	All (3)			
<i>Other Programs</i>						
Public Works	.84	.84	.84	.85	.84	-.01
Welfare Programs	.12	.09	.10	.04	.07	.06
Child Care	.00	.02	.01	.01	.01	.00
Health	.03	.04	.04	.02	.03	.02
Credit or Employment	.01	.01	.01	.09	.05	-.08
Total Number of Issues	153	246	399	195		
<i>Breakdown of Public Works Issues</i>						
Drinking Water	.30	.31	.31	.17	.24	.13
Road Improvement	.30	.32	.31	.25	.28	.06
Housing	.10	.11	.11	.05	.08	.05
Electricity	.11	.07	.08	.10	.09	-.01
Irrigation and Ponds	.02	.04	.04	.20	.12	-.17
Education	.07	.05	.06	.12	.09	-.06
Adult Education	.01	.00	.00	.01	.00	.00
Other	.09	.11	.10	.09	.09	.01
Number of Public Works Issues	128	206	334	166		
<i>Public Works</i>						
Chi-square		8.84	71.72			
p-value		.64	.00			

Notes: 1. Each cell lists the number of times an issue was mentioned, divided by the total number of issues in each panel. 2. The data for men in West Bengal comes from a subsample of 48 villages. 3. Chi-square values placed across two columns test the hypothesis that issues come from the same distribution in the two columns.

# Issues Raised by Women and Men in the Last 6 Month

	Rajasthan					
	Women			Men (10)	Average (11)	Difference (12)
	Reserved (7)	Unreserved (8)	All (9)			
<i>Other Programs</i>						
Public Works	.60	.64	.62	.87	.74	-.26
Welfare Programs	.25	.14	.19	.03	.04	.16
Child Care	.04	.09	.07	.01	.02	.06
Health	.06	.08	.07	.04	.03	.03
Credit or Employment	.06	.06	.05	.04	.09	.01
Total Number of Issues	72	88	160	155		
<i>Breakdown of Public Works Issues</i>						
Drinking Water	.63	.48	.54	.43	.49	.09
Road Improvement	.09	.14	.13	.23	.18	-.11
Housing	.02	.04	.03	.04	.04	-.01
Electricity	.02	.04	.03	.02	.02	.01
Irrigation and Ponds	.02	.02	.02	.04	.03	-.02
Education	.02	.07	.05	.13	.09	-.09
Adult Education	0	0	.00	.00	.00	.00
Other	.19	.21	.20	.12	.28	.05
Number of Public Works Issues	43	56	99	135		
<i>Public Works</i>						
Chi-square		7.48		16.38		
p-value		.68		.09		

Notes: 1. Each cell lists the number of times an issue was mentioned, divided by the total number of issues in each panel. 2. The data for men in West Bengal comes from a subsample of 48 villages. 3. Chi-square values placed across two columns test the hypothesis that issues come from the same distribution in the two columns.

# Effect of Women's Reservation on Investments

Dependent Variables	West Bengal		
	Mean, Reserved GP (1)	Mean, Unreserved GP (2)	Difference (3)
<b>A. Village Level</b>			
Number of Drinking Water Facilities Newly Built or Repaired	23.83 (5.00)	14.74 (1.44)	9.09 (4.02)
Condition of Roads (1 if in good condition)	.41 (.05)	.23 (.03)	.18 (.06)
Number of Panchayat Run Education Centers	.06 (.02)	.12 (.03)	-.06 (.04)
Number of Irrigation Facilities Newly Built or Repaired	3.01 (.79)	3.39 (.8)	-.38 (1.26)
Other Public Goods (ponds, biogas, sanitation, community buildings)	1.66 (.49)	1.34 (.23)	.32 (.48)
Test Statistics: Difference Jointly Significant ( <i>p</i> -value)			4.15 (.001)
<b>B. GP Level</b>			
1 if a New Tubewell Was Built	1.00	.93 (.02)	.07 (.03)
1 if a Metal Road Was Built or Repaired	.67 (.06)	.48 (.05)	.19 (.08)
1 if There Is an Informal Education Center in the GP	.67 (.06)	.82 (.04)	-.16 (.07)
1 if at Least One Irrigation Pump Was Built	.17 (.05)	.09 (.03)	.07 (.05)
Test Statistics: Difference Jointly Significant ( <i>p</i> -value)			4.73 (.001)

Notes: 1. Standard errors in parentheses. 2. In West Bengal, there are 322 observations in the village level regressions, and 161 in the GP level regressions. There are 100 observations in the Rajasthan regressions. 3. Standard errors are corrected for clustering at the GP level in the village level regressions, using the Moulton (1986) formula, for the West Bengal regressions.

# Effect of Women's Reservation on Investments

Dependent Variables	Rajasthan		
	Mean, Reserved GP (4)	Mean, Unreserved GP (5)	Difference (6)
<i>A. Village Level</i>			
Number of Drinking Water Facilities Newly Built or Repaired	7.31 (.93)	4.69 (.44)	2.62 (.95)
Condition of Roads (1 if in good condition)	.90 (.05)	.98 (.02)	-.08 (.04)
Number of Panchayat Run Education Centers			
Number of Irrigation Facilities Newly Built or Repaired	.88 (.05)	.90 (.04)	-.02 (.06)
Other Public Goods (ponds, biogas, sanitation, community buildings)	.19 (.07)	.14 (.06)	.05 (.09)
Test Statistics: Difference Jointly Significant ( <i>p</i> -value)			2.88 (.02)

Notes: 1. Standard errors in parentheses. 2. In West Bengal, there are 322 observations in the village level regressions, and 161 in the GP level regressions. There are 100 observations in the Rajasthan regressions.

3. Standard errors are corrected for clustering at the GP level in the village level regressions, using the Moulton (1986) formula, for the West Bengal regressions.

# OLS Regressions: Determinants of Public Good Provision

	West Bengal				
	(1)	(2)	(3)	(4)	(5)
Reserved for a Woman	.23 (.101)	-.17 (.123)	.00 (.159)	.18 (.136)	.17 (.111)
Reserved * $D_i$	1.63 (.501)		1.22 (.799)	1.56 (.629)	1.67 (.554)
Reserved * $S_i$		2.04 (.642)			
Reserved * $D_{(ij)}$ (village level)			.03 (.047)		
Reserved * $S_{(ij)}$ (village level)			-.01 (.155)		
Pradhan is New					-.09 (.079)
Pradhan is New * $D_i$					-.10 (.323)
Reservation in 2003					.03 (.093)
Reservation in 2003 * $D_i$					-.19 (.326)
Reserved for SC/ST					-.07 (.075)
Reserved for SC/ST * $D_i$					.10 (.145)
$D_{(ij)}$	No	No	Yes	No	No
$S_{(ij)}$	No	No	Yes	No	No
Pradhan's Characteristics	No	No	No	Yes	No
Pradhan's Characteristics * $D_i$	No	No	No	Yes	No



# OLS Regressions: Determinants of Public Good Provision

	Rajasthan			
	(6)	(7)	(8)	(9)
Reserved for a Woman	.16	-.29	.04	.16
	(.115)	(.19)	(.16)	(.118)
Reserved * $D_i$	4.40		4.66	4.29
	(1.454)		(1.6)	(1.491)
Reserved * $S_i$		1.78		
		(.728)		
Reserved * $D_{(ij)}$ (village level)			-.37	
			(.169)	
Reserved * $S_{(ij)}$ (village level)			.05	
			(.27)	
Pradhan is New				
Pradhan is New * $D_i$				
Reservation in 2003				
Reservation in 2003 * $D_i$				
Reserved for SC/ST				.00
				(.18)
Reserved for SC/ST * $D_i$				.03
				(.315)
$D_{(ij)}$	No	No	Yes	No
$S_{(ij)}$	No	No	Yes	No
Pradhan's Characteristics	No	No	No	No
Pradhan's Characteristics * $D_i$	No	No	No	No

# Pradhan's Characteristics (West Bengal)

Dependent Variables	Mean, Reserved GP	Mean, Unreserved GP	Difference
	(1)	(2)	(3)
Years of Education	7.13 (.48)	9.92 (.29)	-2.79 (.54)
Literacy	.80 (.06)	.98 (.01)	-.19 (.04)
Below Poverty Line	.46 (.07)	.28 (.04)	.18 (.08)
Was Elected to the GP Council Before 1998	.11 (.04)	.43 (.05)	-.32 (.07)
Was Elected Pradhan Before 1998	.00	.12 (.03)	-.12 (.04)
Took Part in Panchayat Activities Prior to Being Elected	.28 (.06)	.78 (.04)	-.50 (.07)
Knew How GP Functioned	.00	.35 (.05)	-.35 (.07)
Did Not Receive any Formal Training	.06 (.03)	.00	.06 (.02)
Spouse ever Elected to the Panchayat	.17 (.05)	.02 (.01)	.15 (.04)
Spouse Helps	.43 (.07)	.13 (.03)	.30 (.07)
Will Not Run Again	.33 (.06)	.21 (.04)	.13 (.07)
Observations	54	107	

*Note:* 1. Standard errors, corrected for clustering at the GP level using the Moulton (1986) formula, are in parentheses.

# Robustness Checks

- ▶ *Women as New Pradhans*: compare investments in GPs reserved for women to those in GPs that are not reserved, but where the councilor's seat of the previous Pradhan is reserved. None of the results on public goods provisions are affected. [Results](#)
- ▶ *Women as Lame Ducks*: control for whether the Pradhan is likely to be re-elected in 2003. Restrict the sample of GPs reserved in 1998 and those that will be reserved in 2003. None of the results on public goods provisions are affected. [Results](#)
- ▶ *Social Status and Other Effects of Reservation*: compare outcomes in GPs reserved for SC or ST; among SC/ST Pradhans, women and men come from villages of the same size and men are not significantly richer than women. None of the results on public goods provisions are affected. [Results](#)

They also includes controls in the regression analysis to account for these three factor. [OLS Regressions](#)

## Conclusion

- ▶ Women elected as leaders under reservation policy invest more in the public goods more closely linked to women's concern. They invest less in public goods that are more closely linked to men's concerns.
- ▶ Results contradict the simple intuition behind the Downsian model and the idea that political decisions are the outcomes of a Coasian bargaining process. In both theoretical views, the gender of the head of the GP should not influence policy decisions.
- ▶ Results are relevant given the fact that reservations for women are increasingly being implemented at various levels of government around the world.
- ▶ Additionally, the findings have implications beyond reservation policy, suggesting that, even at the lowest level of a decentralized government, all mechanisms that affect politician's identities may affect policy decisions.

EFFECT OF WOMEN'S RESERVATION IN SELECTED SUBSAMPLES

	Difference Between GP Reserved for Women and Unreserved GP			
	All GPs	Previous Pradhan Barred from Running for Re-election	GP Will Be Reserved in 2003	GP Is Reserved for SC/ST
	(1)	(2)	(3)	(4)
<i>A. Pradhan's Background and Experience</i>				
Pradhan's Education	-2.79 (.54)	-2.58 (.68)	-3.31 (.61)	-2.65 (.86)
Number of Assets	-.64 (.23)	-.70 (.26)	-.60 (.26)	-.37 (.27)
Pradhan is Below the Poverty Line	.18 (.08)	.12 (.10)	.18 (.09)	.12 (.12)
Population of Pradhan's Village	-554 (291)	-482 (312)	-357 (349)	14 (381)
Elected in GP Council Before 1998	-.32 (.07)	-.24 (.08)	-.31 (.08)	-0.14 (.09)
Elected as Pradhan Before 1998	-.12 (.04)	.00 (.)	-0.08 (.04)	-0.02 (.03)
Will Not Run Again	.13 (.07)	.14 (.09)	.13 (.09)	.16 (.1)

*Notes:* 1. Column 2 presents the difference between the mean of the dependent variable in GPs reserved for women and GPs where the previous Pradhan was prevented from re-election due to a reservation of his seat. There are 55 GPs (110 villages) reserved for women, and 51 GPs (102 villages) where the previous pradhan's seat is reserved. 2. Column 3 presents the difference between the mean of the dependent variable in GPs reserved for women and GPs that will be reserved for woman in 2003. There are 55 GPs (110 villages) reserved for women in 1998, and 52 GPs (146 villages) that will be reserved in 2003. 3. Column 4 presents the difference between the mean of the dependent variable in GPs reserved for a woman SC/ST and GPs reserved for a SC/ST. There are 78 GPs (146 villages) reserved for SC and ST, including 28 reserved for women as well. 4. Standard errors are in parentheses, and are corrected for correlation at the GP level in the village level regressions using the Moulton (1986) formula.

EFFECT OF WOMEN'S RESERVATION IN SELECTED SUBSAMPLES

	Difference Between GP Reserved for Women and Unreserved GP			
	All GPs	Previous Pradhan Barred from Running for Re-election	GP Will Be Reserved in 2003	GP Is Reserved for SC/ST
	(1)	(2)	(3)	(4)
<b>B. Women's Participation</b>				
Have Women Addressed a Complaint to the GP in the Last 6 Months	.09 (.05)	.10 (.06)	.11 (.06)	.10 (.06)
<b>C. Public Goods</b>				
Number of Drinking Water Facilities Newly Built or Repaired	9.09 (4.02)	8.44 (5.5)	10.14 (5.25)	10.59 (6.01)
Condition of Roads (1 if in good condition)	.18 (.06)	.21 (.07)	.21 (.06)	.25 (.08)
1 if There Is an Informal Education Center in the GP	-.16 (.07)	-.14 (.09)	-0.13 (.09)	-0.14 (.11)
<b>D. Relationship to Women's Needs</b>				
Coefficient of the Interaction Reserved for Woman * $D_i$	1.63 (.501)	1.63 (.469)	1.63 (.469)	1.54 (.595)

Notes: 1. Column 2 presents the difference between the mean of the dependent variable in GPs reserved for women and GPs where the previous Pradhan was prevented from re-election due to a reservation of his seat. There are 55 GPs (110 villages) reserved for women, and 51 GPs (102 villages) where the previous pradhan's seat is reserved. 2. Column 3 presents the difference between the mean of the dependent variable in GPs reserved for women and GPs that will be reserved for woman in 2003. There are 55 GPs (110 villages) reserved for women in 1998, and 52 GPs (146 villages) that will be reserved in 2003. 3. Column 4 presents the difference between the mean of the dependent variable in GPs reserved for a woman SC/ST and GPs reserved for a SC/ST. There are 78 GPs (146 villages) reserved for SC and ST, including 28 reserved for women as well. 4. Standard errors are in parentheses, and are corrected for correlation at the GP level in the village level regressions using the Moulton (1986) formula.