

Contemporaneous and Lasting effects of Electoral Gender Quotas

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Abstract

This paper examines ways in which electoral gender quotas affect the political system. I use newly compiled data on reserved seat quotas for women in village councils in the Indian state of Jharkhand. I find that gender quotas reduce electoral competitiveness, but only in the first round of elections. They do not affect the caste composition of the winning candidates, nor do they have any spillover effects on other lower hierarchy positions in the council. Village council head positions subjected to gender quotas continue to elect more women even after the quotas are no longer binding. These results suggest that women's representation may be achieved without large negative effects and that temporary electoral gender quotas can be an effective policy tool to increase long-run women's political representation. The results are pertinent for temporary affirmative action policies addressing other forms of discrimination.

Keywords: gender quotas, affirmative action, local governance, panchayati raj, women politicians, village councils

1 Introduction

Quotas are a form of affirmative action that generally involve setting a certain number or percentage of places to be occupied by the under-represented groups (Joy, 2016). A common use of quotas is for women in legislatures, known as electoral gender quotas. These are a form of affirmative action policy to help females get elected. The two most commonly used types of electoral gender quotas are candidate list quotas, which mandate that a fraction of contesting candidates be women, or reserved seat quotas, which mandate that a fraction of seats can only be contested by women. In any form these quotas have a common primary objective of increasing the representation of women in legislatures. Electoral gender quotas are in use in more than 100 countries (Dahlerup et al., 2013).¹

The basic argument for instituting electoral gender quotas is to increase the number of women in elected positions. Women representation in politics is less than their population share in most countries around the world.² Electoral quotas are intended to ensure a more equitable gender distribution of elected positions that is closer to the distribution of the electorate.

Beyond increasing the number of women in legislatures, electoral gender quotas affect policy outcomes. This is because women have different policy preferences than men and emphasize policies directed to benefit women. Chattopadhyay and Duflo (2004) show that women in government affect the type of public goods provided, Bose and Das (2017) find that women leaders take up projects that benefit women, and Chaturvedi et al. (2021) show that this is likely because of greater demand for such projects expressed by households when women are in power. Women in governance reduce corruption (Dollar et al., 2001; Swamy et al., 2001) and infant mortality (Bhalotra and Clots-Figueras, 2014), and they improve education outcomes (Clots-Figueras, 2012) and reporting of crime against women (Iyer et al., 2012). The evidence on the effect of economic efficiency is mixed. Afridi et al. (2017) find more inefficiencies and leakages in public works program in village councils reserved for woman heads. On the contrary, Karekurve-Ramachandra and Lee (2020a) shows that the perceived quality of local public goods is higher in constituencies subject to gender quotas. Das et al. (2017) show that under certain conditions, quotas may increase electoral competition and, consequently, improve provision of public goods.

In this paper, I examine number of ways in which gender quotas affect the political system. I study if electoral gender quotas have anti-competitive effects, spillover effects on lower hierarchy positions, externalities on representation of other demographic groups, and lasting effects after they are no longer binding. These positive and negative effects frequently arise while discussing gender

¹Compared to this, the second most common setting for gender quotas is in corporate boards, which exist in only 11 countries (World Bank Group, 2018).

²As of 2019, only three out of 193 countries - Rwanda, Cuba and Bolivia - have more than fifty percentage of women in the lower or single House. Sixteen out of 193 have proportion of women at least 40% (Inter-Parliamentary Union, 2019).

quotas and the paper intends to provide empirical evidence to inform these discussions. I examine these issues using newly compiled data on reserved seat quotas for women in village councils in the Indian state of Jharkhand, spanning two consecutive elections held in 2010 and 2015. These data are ideal since the seats subject to quotas were quasi-randomly allocated in each election which the identification exploits.

Electoral gender quotas can reduce electoral competitiveness by reducing the pool of eligible candidates (Auerbach and Ziegfeld, 2020). Reduction in competition, which can negatively affect economic efficiency, is a common argument against such quotas. However, the quotas can also increase electoral competitiveness by inducing more women to contest the election because of increased likelihood of winning. Hence, the net effect on electoral competitiveness is ambiguous. I find that gender quotas reduce electoral competitiveness, as measured by vacant seats or seats contested by a single candidate, but only in the first round of elections. In the first round, council member seats subject to gender quotas are twice likely to be vacant (2.5%, an increase of 1.3 percentage points) and more likely to be contested by a single (women) candidate (21%, an increase of 9.6 percentage points), compared to council member seats not subject to quotas. This is consistent with gender quotas reducing the pool of eligible candidates by a larger magnitude than an increase in women candidates. However, these effects are not observed in the second round of elections (2015) when a council member seat subject to gender quotas is equally likely to be vacant and contested by single candidate, compared to council member seats not subject to quotas. It is likely that experience gained by women after the first round of elections makes them more likely to contest elections in the second round reducing the likelihood of vacant seats and seats contested by a single (women) candidate. Thus, at least at the extensive margin, the increase in the number of women candidates offsets the decrease in the number of male candidates.

Gender quotas may have externalities on representation of other demographic groups by changing the composition of winning candidates on other dimensions of identity such as minority status and caste. This unintended consequence of gender quotas has been shown in previous research that has found evidence of gender quotas in India affecting the caste composition of winning candidates. This is because caste groups in which women have a relatively favorable status may be more likely to contest and win seats reserved for women as compared to those where the status of women is unfavorable. Cassan and Vandewalle (2021) finds that reservations for women lead to a marked decline in the likelihood a high caste candidate winning the village council election. Karekurve-Ramachandra and Lee (2020b) also show that constituencies reserved for women are less likely than unreserved constituencies to elect members of groups where the status of women is low. I find that gender quotas do not affect the caste composition of the winning candidates. The proportion of seats won by each caste is similar when the seat is subject to gender quotas and when it is not. One explanation for the disparate effects as compared to previous literature could be that caste groups do not differ in terms of status of women in the state I focus on. This also highlights the

importance of replicating results in different settings.

Gender quotas at high hierarchy positions may have “trickle-down” or spillover effects on women’s representation at lower hierarchy positions.³ The results on these desirable effects have been mixed. Such effects have been documented between female board representation and female executive representation (Gould et al.). But Bertrand et al., 2018 does not observe such effects while studying board gender quotas in Norway. We might expect more women to contest and win at lower hierarchies of village councils if it is certain that the council head is going to be a women. This could be because of motivation due a role-model effect or the expectation of more favorable work environment (Campbell and Wolbrecht, 2006). The women may also have more support from the family to work at positions supervised by women. I find no spillover effects of gender quotas at the council head position on women representation at the deputy council head and council member positions. Councils, where the head position is subject to gender quotas, are equally likely to elect women at deputy council head position and have same proportion of women at council member positions as compared to councils where the head position is not subject to gender quotas. At both positions, women are already present in significant numbers, so quotas do not seem to have additional effect on further increasing the numbers.

A prominent feature of electoral gender quotas is that they are generally considered to be a temporary solution to increase representation of women in the legislature. The hope is that instituting temporary quotas would remove the barriers women face in entering politics. Once these barriers are removed, women can freely participate in the political process, naturally increasing women representation in the long run, even without quotas. However, if the women are thought to be following the directions of male advisors, or the women do not perform well after getting elected (possibly due to lower education, training, experience and “contacts” to get work done) the negative stereotypes for women may be hardened, further reducing their long run representation. Additionally, if women face taste-based discrimination, there can be no long run effects of temporary quotas. Quotas can also be viewed negatively by the public, leading to stigmatization and backlash effects, which can have negative long-run effects (Clayton, 2015).

I find that village councils head positions subjected to mandated reserved seat quotas continue to elect more women as compared to those not subjected to the quotas, even after the quotas are no longer binding. The probability of a woman winning an unreserved seat in the next election is five times higher (17%) if the seat was reserved in the previous election, as compared to when it was not (3.3%). Thus, there is an increase of 13.6 percentage points in probability of woman winning an unreserved seat in the next election due to quota in the previous election. This effect is substantial, considering the secular increase in the absence of quotas is less than 1 percentage point and resulted in additional 275 women becoming council heads (around 6% of total positions

³Gender quotas at sub-state level help females enter politics at state and federal levels (Goyal, 2020a,b; Karekurve-Ramachandra, 2020; Maitra and Rosenblum, 2021; O’Connell, 2020).

available). Since the next-election effects are positive, it is reasonable to expect similar effects in the long run. Hence, even temporary quotas can be effective policy tools to increase long-run representation, which is one of the primary objectives of such quotas. The lasting effects also suggest that at least a part of discrimination faced by women is statistical, which can be remedied by quota-like policy interventions.

There is no evidence that village council observables such as women literacy, population, labor force participation, or economic status of the village council explain the lasting effects. Women are equally likely to win councils with high women literacy, high population of women, high women labor force participation, and high level of electricity availability as those with low levels of these variables. The probability of a non-incumbent woman winning an unreserved seat in the next election is two times higher (5%) if the seat was reserved in the previous election, as compared to when it was not (2.5%). This entry of “new” women into politics due to quotas suggests a weakening of gender stereotypes against women.

Across the analysis, the size of effect of quotas in the next/current election is inversely proportional to the likelihood of women winning seats not subject to quotas. For example, at the council head position, when women are 3.3% likely to win seats not subject to quotas, the lasting effect of quotas is 13.6 pp. But at the council member position, when women are 11.3% likely to win seats not subject to quotas, there is no effect of quotas. Likewise, there are no downstream effects are observed at deputy council head position and council member positions, where women are winning 43% and 62% of seats not subject to quotas. One explanation could be that quotas are useful when women are unable to win in their absence. It is possible that there are bigger barriers to competing for prestigious head positions than competing for member positions and reservation helps to bring down those barriers. This can also explain why Bhavnani (2017) finds lasting effects at council member position in Mumbai city councils as for a big city like Mumbai, even council member is a prestigious position. Moreover, quotas do not have an additional effect when women are already winning in significant numbers.

These results add to the literature that studies the effects of electoral gender quotas by providing additional case study using new data from India. This is one of the few papers that uses data from state that has 50% seats reserved for women and studies spillover effects of electoral gender quotas on lower hierarchy positions. The paper studies lasting effects at village council head and member level together making for easy comparison. This paper complements Beaman et al. (2009); Bhavnani (2009) by studying the lasting effects of gender quotas in a more recent time and a different social context. It is important to re-examine the effects observed in earlier periods with rise in women’s voting in India (Rai, 2011).

The results directly inform two policy debates in India. The first debate addresses the implementation of quotas for women in the state and national legislatures. The effects of such quotas in

Jharkhand shown in the paper can add to this policy debate. The second debate relates to reserving seats in village councils for women for two elections instead of one. I provide evidence that reservations in even one election help women significantly. This would help in accurately evaluating the relative benefits of reservations in two elections.

The results suggest that women representation may be achieved without large negative effects and that temporary electoral gender quotas can be an effective policy tool to increase long-run women's political representation. The results are pertinent for temporary affirmative action policies addressing other forms of discrimination.

2 The Indian Panchayati Raj System

The Indian Panchayati Raj System (PRS) is a decentralization scheme established by the Indian Constitution (Seventy-third Amendment) Act, 1992 (PR Act). The purpose of the constitutional amendment was to create a system of local government bodies, to facilitate the implementation of federal and state government policies, and to involve people in preparation of plans for economic development and social justice. Although local government bodies existed in different forms in many states of India, these institutions had not been “able to acquire the status and dignity of viable and responsive people's bodies due to a number of reasons” (the Constitution Seventy-third Amendment Act; 1992). The federal act laid down the structure of the local government bodies, and states were supposed to enact or adapt existing laws in accordance with the federal law (Chaudhuri, 2006). The implementation of the PR Act in the fifth schedule areas, which are areas predominantly populated by tribal populations and are explicitly identified by the constitution of India, was done through a later act, the Provisions of the Panchayats (Extension to the Scheduled Areas) (PESA) Act, 1996. The PESA gave councils in the scheduled areas more autonomy than what was given in the PR Act. A more detailed discussion on how these areas differ is in Appendix C.

States were advised to devolve powers to these local government bodies to enable them to function independently with respect to (a) the preparation of plans for economic development and social justice and (b) the implementation of schemes for economic development and social justice. A suggestive list of 29 items included public goods such as sanitation, water works and maintenance of public services (see Appendix B).⁴ The councils have limited ability to raise revenue and depend on the grants from state and federal government. A State Finance Commission is to be constituted every five years to review the financial position of the councils and make recommendations to the

⁴In practice, the village councils mainly assist in implementing the state and federal government schemes by identifying beneficiaries. The only program whose implementation was designed to be driven by the village councils is the National Rural Employment Guarantee Act (NREGA). A large portion of funds received by the village councils are for this program. There is also anecdotal evidence that, after the implementation of NREGA, there has been renewed interest among people to contest in these elections as these local bodies positions are now considered more lucrative (Moyna, 2010). Under NREGA, the village councils decide which projects they wish to implement and the villagers work on these projects for a fixed wage per day. A lot of funds flow through these councils, making them quite influential.

governor of the state regarding the determination and distribution of tax proceeds between state and councils and any other measures needed to improve the financial position of the councils.

Under the PRS system, every village in India is part of a three-tier system of local governance that exists below the federal and the state government. The first tier is at the district-level, followed by block-level and village-level (see Figure 2 in Appendix C). District has the largest administrative area, followed by block and village councils. Thus, there are multiple block councils within administrative area of a district council, and multiple village councils within the administrative area of a block council. A council exists at each of these levels comprised of a head, a deputy head and members. These councils are the administrative units of the PRS and the implementation agency for government schemes and decision-making bodies at the local level.⁵ These councils are formed by direct and indirect elections held every five years conducted by respective State Election Commission, and contested by individuals belonging to the council's jurisdiction. The jurisdiction of the district councils, block councils, and village councils are the respective district, block, and village areas.⁶ The heads of village councils are members of the block council and likewise, the heads of block councils are members of district councils.

The PR Act mandated reserved seat quotas for Scheduled Castes (SCs), the Scheduled Tribes (STs), women, and empowered the state legislatures to provide such quotas for Other Backward Classes (OBCs) in the councils. The federal government believed that insufficient representation of these groups was a deterrent to the effective functioning of the existing councils, and hence the mandated reservations were instituted to increase representation of these groups.⁷. While the number of seats reserved for SCs, STs are to be in proportion to the group's population in a council's jurisdiction, those reserved for women must be at the least one-third of total seats available. These seats that are reserved for women and caste groups can only be contested by these groups. These council head seats reserved for SCs, STs and women are to be rotated across elections according to rules framed by states separately. While reserved seat quotas for SCs and STs exist in the state and national legislatures in India, this was the first instance of electoral gender quotas in India.

2.1 The Panchayati Raj in Jharkhand

The analysis in this paper focuses on the Indian state of Jharkhand. This is a mid-size state in eastern India with a population of around 32 million (ranked 14 out of 29 among all Indian states) and an area of around 30,000 square miles (ranked 16 out of 29 among all Indian states) and located in the eastern part of India (see Figure 4 in Appendix E). It is also a relatively new state, as it was carved out of the neighboring state of Bihar on November 15, 2000. This state is extremely rich

⁵In urban areas, instead of village councils, there exist city councils. They have more autonomy as compared to the village councils and mostly work independently of district or block councils.

⁶The PR Act mandates that all the council members and the council heads of district and block councils must be elected directly by all the voters in the council's jurisdiction. The council head of the village councils might be elected directly by all the voters in the council's jurisdiction, or indirectly by the elected council members.

⁷Statement of Objects and Reasons PR Act

in minerals, which account for more than 40% of the minerals of India and is predominantly rural with 75% of the population in rural areas. One-fourth of the total population is tribal and hence 13 out of 24 districts, and some areas of 3 additional districts, inhabited by tribal population are designated as Scheduled Areas. (See Figure 5 in Appendix F).

Jharkhand has around 4,300 village councils, 262 block councils and 24 district councils. A village council may comprise one or many contiguous villages of roughly 5,000 individuals. Each village council area is divided into 10 “wards”, each having roughly 500 individuals and represented by one council member. The Jharkhand PR Act lists the functions to be done by the village councils, which include execution of plans for development of agriculture and horticulture, drinking water facilities, roads, water ways and other means of communication and rural electrification.

The village council members and head are directly elected. Each voter casts one vote each for the position of village council member, village council head, block council member and district council member corresponding to the jurisdiction of the voter’s residence. The candidate who receives the maximum number of votes is declared the winner. While the city council elections have been fought on a party basis since January 2018, the village council elections are run on a non-party basis.⁸ A deputy village council head is elected by the elected village council members among them.

The process of reserving village council seats is outlined in the Jharkhand Panchayat Nirvachan Niyamavali, 2001 (JPNN), which are the rules made by the Jharkhand state and are applicable to all the rural local governing bodies in the state. The state also has mandated reserved seats for Other Backward Classes (OBCs) in addition to the Scheduled Castes (SCs) and Scheduled Tribes (STs). Notably, Jharkhand is one of the states that has mandated 50% reserved seats for women in the local government bodies, more than the one-third required by the PR Act.

I focus on the first two village council elections in Jharkhand that happened in 2010 and 2015, respectively.⁹ There was no system of local governance before 2010.¹¹ In Appendix A, I describe the process of reserving seats in the first (2010) and the second (2015) round of elections and argue that the process leads to roughly half of the village council head positions being reserved for women. Also, I argue that these village councils are comparable to the rest of the councils.

⁸Political parties do seem to get involved in the process. For example, the Communist Party of India claimed that *their* candidates won a number of positions in elections in 2010 (Bakshi, 2010).

⁹Jharkhand was an outlier in the implementation of the PRS. While all major states had at least one round of elections by 2001, Jharkhand held the first round of urban local bodies elections in 2008 and rural local bodies in 2010. The delay was due to court cases opposing the reservation of seats for Other Backward Classes (OBC) and for the Scheduled Tribes (ST).¹⁰

¹¹The previous elections for rural local bodies were conducted 32 years earlier, in 1978, before the federal PR Act and without any reservation for women. It is reasonable to believe that elected bodies from these elections had long ceased to exist.

3 Data

The data for village council elections held in 2010 and 2015 come from the Jharkhand State Election Commission (SEC). This is either downloaded from the SEC website or requested from them through Right to Information requests. All the data are in Hindi, which is manually translated into English and in a machine-readable format. For each village council in the state of Jharkhand, I observe the status of caste and gender reservations for council head position, and the name of the winning candidate. Data for the gender of the deputy council head are available for two districts in 2010 (Dhanbad and Lohardaga) and 2015 (Deoghar and Garhwa). Data for the proportion of women council members are available only for one district (Chatra). Since the SEC does not record the gender of the winning candidate, I infer it manually from the name of the winning candidate. Since Indian names have a very strong gender connotation, it is relatively easy to infer the sex.¹² Three districts provide information on the status of caste and gender reservation for council member seats. Vacant council member seats data are available for two districts (Chatra and Deoghar), won unopposed data are available for one district (Deoghar). Data on council head age, caste, occupation and highest qualification of the winning candidates for some districts in 2015 comes from the Local Government Directory (LGD), which is maintained by the Government of India as a centralized repository of all the Panchayati Raj bodies (Government of India, 2015). Village level data for observables come from the Census of India, 2011. The mapping between villages and panchayats is obtained from the ministry of drinking water and sanitation's Integrated Management Information System (IMIS) database (Indiawater).

In Table 1 shows the summary statistics for village council seats in the elections held in 2010 and 2015. The first part includes village council head seats. In 2010, 53% of seats were reserved for women while women won in 56% of the seats. Analogous numbers for 2015 are 52% and 61%.¹³ Women winning unreserved seats increased from 2 percentage points in 2010 to 6 percentage points in 2015. The deputy council head position is not subject to quota. I still observe 41% of these positions won by women. The second part of the table includes village council member seats. In 2010, 60% of these were reserved for women, while women won around 64% of them. In 2015, 52% of them were reserved for women, while women won 58% of these. It can also be seen that 17% of seats in 2010 and 25% of seats in 2015 were won unopposed or contested by a single candidate. A very small proportion of seats were unfilled in 2010 (2%) and in 2015 (0%).

¹²I check the accuracy of my inference by using data from the National Rural Employment Guarantee Act (NREGA) website where the gender of the village council head can be inferred from the name prefix. The classification accuracy is more than 94%.

¹³The proportion of reserved seats can be higher than the mandate of at least 50% if there are odd number of seats. Also, in a block where there is only one seat to be reserved for any community, the seat was reserved for women in 2010 and then turned unreserved in 2015. This leads to a slight decrease in the percentage of seats reserved for women in 2015.

Table 1: Summary statistics for council head and member seats

	2010		2015	
	Obs	Mean	Obs	Mean
Reserved for woman	4,384	0.53	4,383	0.52
Woman won	4,373	0.56	4,378	0.61
Reserved for SC	4,382	0.10	4,383	0.09
SC won			1,556	0.09
Reserved for ST	4,382	0.51	4,383	0.52
ST won			1,556	0.50
Reserved for OBC	4,382	0.11	4,383	0.10
OBC won			1,556	0.28
Open	4,382	0.28	4,383	0.28
Open won			1,556	0.12
Deputy council head woman	289	0.41	380	0.41
Proportion of women council members	154	0.62	154	0.62
Reserved for woman	5,656	0.60	7,381	0.52
Woman won	3,679	0.64	7,292	0.58
Unopposed	1,502	0.17	1,402	0.25
Vacant	3,423	0.02	3,737	0.00

The upper half shows data for council head seats. Total village councils are approximately 4,400.

Limited data for caste of council head is available for twenty districts in 2015. Data for the gender of the deputy council head are available for two districts in 2010 (Dhanbad and Lohardaga) and 2015 (Deoghar and Garhwa). Data for the proportion of women council members are available only for one district (Chatra).

The lower half shows data for council member seats available for three districts (Chatra, Dhanbad, and Deoghar).

4 Empirical Strategy

To study the contemporaneous effect of gender quotas I estimate the following model using a sample of village council seats

$$Y_s = \beta_0 + \beta_1 \text{reserved_for_woman}_s + \epsilon_s \quad (1)$$

where Y_s is the outcome of interest on council seat s , $\text{reserved_for_woman}_s$ equals 1 if the seat was reserved for a woman and 0 otherwise, and ϵ_s is the error term. The model will be estimated separately for seats in 2010 and 2015 election cycles.

For lasting effects, the model will be as follows

$$Y_{s,2015} = \beta_0 + \beta_1 \text{reserved_for_woman}_{s,2010} + \epsilon_s \quad (2)$$

where $Y_{s,2015}$ is the outcome of interest on council seat s in 2015 election, $\text{reserved_for_woman}_{s,2010}$ equals 1 if the seat was reserved for a woman in 2010 election cycle and 0 otherwise, and ϵ_s is the error term. The model will be estimated using seats in 2015.

The coefficient of interest is β_1 that indicates the change in the outcome on seats reserved for women as compared to seats not reserved for women. Consistent estimation of β_1 requires that, the variable $\text{reserved_for_woman}$ is uncorrelated with factors that affect the probability of a woman winning. I argue that this assumption holds as the process of reserving village council seats ensure a quasi-random selection of seats to be reserved. (Appendix A).

One may be concerned that the process of reserving village council seats was not followed in practice and there was manipulation in which seats were reserved for women. I do not find evidence of this. First, the total proportion of seats reserved for women is at least 50% as mandated (Table 1). Second, for around half of the councils, (those in the scheduled areas) I can check that the allocation of village councils to women happened as per rules, i.e., odd numbered in the first round and even numbered in the second round were assigned to women. Third, the village councils reserved for women have similar observable characteristics as those that were not (Table 2). Lastly, the councils subjected to quotas and not subjected to quotas are spatially evenly distributed (Appendix G). These observations lends credibility to the assumption of randomized selection of seats reserved and unreserved for women.¹⁴

¹⁴A subtle threat to identification of lasting effects is discussed in Sekhon and Titunik (2012). The authors argue that having reservation in the second round and then focusing on unreserved seats *as if* there are no reserved seats could be problematic if (i) there is a “discouraging effect”, or women being discouraged to contest on non-reserved seats and (ii) this effect is stronger on seats unreserved in both elections as compared to seats reserved only in the first election, the estimate of next round effect may be biased towards finding a positive effect. Intuitively, the discouraging effect artificially reduces the number of female winners in the unreserved group as compared to the treatment group/ ideal case. For small values of discouragement effect as compared to true treatment effect, the bias is likely to be small. I assume this to be the case for this paper.

Table 2: Comparison of observables for village councils in 2010

	Not reserved	Reserved	Difference in means	
	Mean	Mean	Diff.	t-stat
Population				
Number of households	1,101	1,116	-15.44	-1.43
Total population	5,831	5,924	-93.72	-1.65
Proportion of women	.49	.49	0.00	0.25
Proportion SC	.12	.13	-0.01*	-2.12
Proportion ST	.33	.32	0.01	1.07
Proportion under age 6	.17	.17	-0.00	-0.62
Literacy and Labor				
Proportion literate - women	.41	.4	0.00	0.56
Proportion literate - males	.6	.6	0.00	0.76
Women labor force participation	.35	.35	0.00	0.54
Male labor force participation	.53	.53	0.00	1.32
Economic status				
Main source of drinking water is well	.27	.27	0.01	0.96
Main source of drinking water is handpump	.31	.3	0.00	0.30
Lighting source - Electricity	.19	.18	0.01	1.44
Lighting source - Kerosene	.46	.45	0.01	0.40
Cooking fuel - firewood	.5	.48	0.02	1.49
Have radio	.11	.11	0.00	1.50
Have bicycle	.41	.39	0.02*	2.00
N	1,889	2,174	4,063	

Except total households and total population, all observables are proportions. t-statistic is for null hypothesis of equal means. For all observables except two, I cannot reject the null of equal means.

The F statistic for the regression where the dependent variable is a treatment indicator and all the observables are controls is less than 2, suggesting that these observables, even jointly do not have much strength in predicting treatment. Data Source: Census of India, 2011

5 Contemporaneous effects

5.1 Electoral competitiveness

Electoral gender quotas can reduce electoral competitiveness since by barring men to contest, they mechanically reduce the pool of eligible candidates. Reduction in competition which can negatively affect economic efficiency, is a common argument against such quotas. However, they also may have an opposite effect by incentivizing more women to contest elections. Some women, who may have chosen not to contest election in absence of gender quotas, because they thought they are not likely to win, may be more willing to contest election in its presence.

To study which effect dominates, I estimate equation 1 with two different dependent variables: an indicator that turns one if the seat was vacant else zero, and an indicator that turns one if the seat was contested by a single candidate i.e. won “unopposed”. If gender quotas reduce electoral competitiveness, seats subject to gender quotas must be more likely to remain vacant or contested by a single (women) candidates.

The results for vacant seats are shown in columns 1 through 4 in Table 3. The estimates from model 1 indicate that a seat is 1.2% likely to be vacant if it is *not* subject to gender quota. This probability increases by 1.3 percentage points (=2.5%) if the seat is subject to gender quota. In model 2, I use council fixed effects such that the seats within the same council, which are more likely to be similar, are compared. The increase in unfilled probability is now 1.4 percentage points. In model 3 and 4, use data for 2015. Estimates from model 3 suggest that in 2015, a seat is 0.4% likely to be unfilled. This probability does not change if the seat is subject to gender quota. The results are similar in model 4 that uses council fixed effects.

Table 3: Electoral competitiveness

	Vacant				Won unopposed			
	(1) 2010	(2) 2010	(3) 2015	(4) 2015	(5) 2010	(6) 2010	(7) 2015	(8) 2015
reserved for woman	0.013** (0.005)	0.014** (0.004)	-0.000 (0.002)	-0.000 (0.002)	0.096*** (0.020)	0.093*** (0.020)	0.020 (0.023)	0.017 (0.022)
Constant	0.012** (0.004)		0.004** (0.001)		0.114*** (0.015)		0.242*** (0.017)	
N	3,420	3,418	3,737	3,737	1,501	1,499	1,402	1,402
R sq.	0.002	0.226	0.000	0.118	0.015	0.156	0.001	0.179
Council FE	No	Yes	No	Yes	No	Yes	No	Yes
Number of districts	2	2	2	2	1	1	1	1

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The dependent variable is an indicator which equals 1 if seat is vacant (models 1-4) or contested by a single candidate (models 5-8), else 0. The sample is council member seats in 2010 and 2015. Vacant seats data are available for two districts (Chatra and Deoghar), won unopposed data are available for one district (Deoghar).

Results for unopposed seats are shown in columns 5 through 8 in Table 3. The estimates from model 5 indicate that a seat is 11.4% likely to be unopposed if it is *not* subject to gender quota. This probability increases by 9.6 percentage points (=21%) if the seat is subject to gender quota. Model 6 uses council fixed effects such that the seats within the same council, which are more likely to be similar, are compared. The increase in unopposed probability is now 9.3 percentage points. Models 7 and 8 use data for 2015. Estimates from model 7 suggest that in 2015, a seat is 24.2% likely to be unopposed. This probability does not change much if the seat is subject to gender quota. The results are similar in model 4 that uses council fixed effects.

These results show that gender quotas decrease electoral competitiveness as measured by the increase the probability of seat being vacant and contested by a single candidate by around two times. However, the effects are only observed in the first round of elections. In the second round, seats subject to gender quotas are equally likely to be vacant and won unopposed. It is likely that experience gained by women after the first round of elections makes them more likely to contest elections in the second round. The results also suggest that, at least at the extensive margin, the increase in the number of women candidates offsets the decrease in the number of male candidates. This finding goes against the argument that the lack of women in politics is because of unavailability of

candidates. A favorable policy environment can be used to incentivize women to contest elections.

5.2 Effect on the caste structure

Gender quotas may effect the composition of winning candidates on other dimensions of identity such as minority status and caste. Previous research has found evidence of gender quotas in India affecting the *caste composition* of winning candidates. This is because caste groups in which women have a relatively favorable status, may be more likely to contest and win seats reserved for women compared to those castes where the status of women is unfavorable. This would result in the caste groups with favorable status of women being disproportionately represented in seats reserved for women. I examine this unintended effect of gender quotas.

If gender quotas affect caste composition, seats subject to gender quotas must have a different caste distribution compared to seats not subject to quotas. To study this issue, I estimate equation 1 using seats not subject to caste quota with dependent variable that turn one if the seat was won by candidate of particular caste else zero. I estimate models using data for 2015 (second) rounds of elections as caste information is only available for this round. If gender quotas affect caste composition, seats subject to gender quotas must be more or less likely to be won by individual castes.

Table 4: Effect on caste of winning candidate

	SC win		ST win		OBC win		OPEN win	
	(1) 2015	(2) 2015	(3) 2015	(4) 2015	(5) 2015	(6) 2015	(7) 2015	(8) 2015
reserved for woman	-0.029* (0.012)	-0.023 (0.013)	-0.002 (0.017)	-0.001 (0.013)	0.020 (0.017)	0.011 (0.021)	0.012 (0.022)	0.013 (0.021)
Constant	0.055** (0.013)		0.032* (0.013)		0.516*** (0.065)		0.397*** (0.068)	
N	456	406	456	406	456	406	456	406
R sq.	0.006	0.198	0.000	0.285	0.000	0.414	0.000	0.484
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Number of districts	8	8	8	8	8	8	8	8

Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In model 1, the dependent variable is an indicator which equals 1 if SC candidate won in 2015, else 0. The sample is council head seats not subject to caste quota in 2015 available for eight districts. SC = Scheduled Caste, ST = Scheduled Tribe, OBC = Other Backward Castes, OPEN = Everything else. Controls include demographic, education, labor force and economic status observables as shown in Table 2.

Table 4 shows the effect of gender quotas on caste composition. The estimates from model 1 indicate that a seat is 5.4% likely to be won by SC candidate if it is *not* subject to gender quota. This probability decreases by 2.9 percentage points (=2.5%) if the seat is subject to gender quota. In model 2, where I control for observable differences in demography, education, labor force and economic status between councils, the probability of SC candidate winning a seat is not affected if the seat is subject to gender quota. The rest of the models indicate that the probability of ST,

OBC or OPEN candidate winning a seat is not affected by gender quotas.

These results show that reserving seats for women does not affect the caste composition of winning candidates. One explanation for the disparate effects as compared to previous literature could be that unlike some of the other papers, in this case, seats were reserved for caste groups in addition to women. Explicitly having seats reserved for caste groups likely affects the caste distribution in seats not subject to caste quotas.

5.3 Spillover effects

I examine the “trickle-down” effects of the gender quotas. We might expect more women to contest and win at lower hierarchies of village councils if it is certain that the council head is going to be a women. This could be because of motivation due a role-model effect or the expectation of more favorable work environment. The women may also have more support from the family to work at positions supervised by women.

To study this issue, I estimate 1 with two different dependent variables: An indicator that turns one if the deputy council head was women else zero, and proportion of women council members. If gender quotas have spillover effects, it must be true that village councils, where the head position is subject to gender quotas, are more likely to elect women at deputy council head and have a higher proportion of women at council member positions.¹⁵

Table 5: Spillover effects

	Deputy council head women				Proportion of women in council			
	(1) 2010	(2) 2010	(3) 2015	(4) 2015	(5) 2010	(6) 2010	(7) 2015	(8) 2015
reserved for woman	-0.042 (0.058)	-0.087 (0.063)	0.021 (0.051)	0.008 (0.053)	-0.001 (0.017)	-0.001 (0.017)	0.019 (0.014)	0.018 (0.014)
Constant	0.434*** (0.042)		0.402*** (0.037)		0.622*** (0.013)		0.608*** (0.010)	
N	289	263	380	375	154	153	154	153
R sq.	0.002	0.117	0.000	0.134	0.000	0.207	0.011	0.286
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Number of districts	2	2	2	2	1	1	1	1

Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

In models 1-4, the dependent variable is an indicator which equals 1 if deputy council head was women, else 0. In models 5-8, the dependent variable is a ratio of number of women council members to total council members. The sample is council head seats in 2010 and 2015. Data for the gender of the deputy council head are available for two districts in 2010 (Dhanbad and Lohardaga) and 2015 (Deoghar and Garhwa). Data for the proportion of women council members are available only for one district (Chatra). Controls include demographic, education, labor force and economic status observables shown Table 2.

The results for deputy council head are shown in columns 1 through 4 in Table 5. The estimates from model 1 indicate that in 2010, women are 43.4% likely to win the deputy council position if

¹⁵Council member positions are also subject to gender quotas such that at least 50% of the seats are reserved for women. The gender quotas do not apply deputy council head position. After the council head and members are directly elected by the electorate, the council members chose one member as deputy council head among themselves.

the council head seat was *not* subject to gender quota. This is remarkable since there are no gender quotas for this position. There is no statistically significant change in this probability if the council head seat was reserved for women. Model 2 included block fixed effect so the councils in the same block are compared. There is still no significant effect of council head seat reservation. Models 3 and 4 use data for 2015 and continue to find insignificant effect of council head seat reservation.

The results for proportion of women at council member positions are shown in columns 5 through 8 in Table 5.¹⁶ The estimates from model 5 indicate that in 2010, the proportion of women council members when the council head seat is not reserved for women is 62.2%. This is higher than the 50% proportion of seats reserved for women. The proportion is no different when the council head position is reserved for women. The results are similar when using block fixed effect in model 6, and for 2015 in model 7 and 8. Thus, having a women council head does not seem to affect the proportion of women in the council that is already higher than 60%.¹⁷

Thus, I do not find spillover effects of gender quotas at the council head position on deputy council head and council member positions. One potential explanation could be that women are already present in significant numbers at both these positions (>40% at deputy council head and >60% at council member positions). So, there is no marginal effect of gender quotas in increasing these numbers further.

6 Lasting effects

The basic motivation to study lasting effects is to test an implicit assumption for gender quotas. Electoral gender quotas are generally considered to be a temporary solution to increase representation of women in the legislature. The hope is that instituting temporary quotas would remove the barriers women face in entering politics. Once these barriers are removed, women can freely participate in the political process, naturally increasing women representation in the long run, even without quotas. In a developing country context, the barriers could be from the candidate (supply) side: stereotypes about roles women play in the society and material barriers, such as lack of money for an election campaign and contacts to win party nominations. There could also be voter (demand) side barriers: stereotypes and biases against women's ability to lead, so that it is hard to get elected despite capability. Theoretically, quotas can counteract both of these factors. Quotas reduce the cost of contesting elections for women and allow them to gain experience. In the presence of reserved seat quotas, since only women can participate in elections, gender norms may be suppressed. Also, since a woman must win a quota seat, voters can see how she performs her duties and update women beliefs about a women's ability to lead to remedy stereotyping. Since gender stereotypes are something which have a permanent effect, we may see lasting effects of quo-

¹⁶The denominator counts seats that were unfilled.

¹⁷Since deputy council members are elected among these members, more than 40% of these positions are won by women, and having a women council head does not affect this proportion.

tas. Indeed, if the women elected under a quota system are seen to be capable enough, negative stereotypes about woman's ability to lead are broken, then one can expect that quotas will become redundant in the long run.¹⁸

I examine this issue by estimating equation 2 using village council head seats not subject to gender quotas in 2015. The dependent variable turns one if the seat was won by women in 2015, else zero. The main explanatory variable is an indicator variable that turns one if the seat was reserved for women in 2010. If gender quotas have lasting effects, seats subject to gender quotas in 2010 must be more likely to be won by women in 2015.

Table 6: Lasting effects - Council head position

	Woman win in 2015				
	(1)	(2)	(3)	(4)	(5)
reserved for woman in 2010	0.136*** (0.011)	0.171*** (0.014)	0.140*** (0.014)	0.135*** (0.015)	0.110*** (0.023)
Constant	0.033** (0.010)	0.049* (0.018)			
District FE			X		
Block FE				X	X
Controls					X
Scheduled areas		X	X	X	X
N	1,102	2,093	2,093	2,093	1,936
Treat	654	1,607	1,607	1,607	1,496
Control	448	486	486	486	440
R sq.	0.044	0.035	0.068	0.186	0.214

Standard (clustered by district) errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The dependent variable is an indicator which equals 1 if seat was won by women in 2015 else zero.

The sample is unreserved council head seats in 2015. Controls include demographic, education, labor force and economic status observables shown Table 2.

Table 6 presents the the lasting effects of gender quotas at council head position. The estimates from model 1 indicate that the probability of a woman winning an unreserved seat in 2015 when the seat was *not* reserved in 2010 is 3.3%. This probability increases by 13.6 percentage points if the seat was reserved for a woman in 2010. Thus, when the seat was reserved in 2010, the probability of a woman winning in 2015 is 17%, which is more than five times the probability of woman winning on an unreserved seat in 2015 when the seat was *not* reserved in 2010 (3.3%). In model 2, I add village councils from scheduled areas. This only increases the size of the treatment group since all these new councils were reserved for women previously in these councils. The probability of a woman winning a seat is now higher by 17.1 percentage points if the seat was reserved in 2010. Model 1 is the preferred model since it allows estimation of a meaningful intercept and the estimates are based on areas that are more likely to be similar.

The rest of the models study the robustness of the estimates to district fixed effects (model 3), block

¹⁸Even if the gender stereotypes are not broken, there may be a role model effect for other women which may encourage participation in elections, both voting and candidature.

fixed effects (model 4) and controls (model 5). Using fixed effects, the comparisons are focused on village councils within a block or district that are geographically close to each other and are more likely to have similar cultural attitudes. The increase in the probability of a woman winning on an unreserved seat when the seat was previously reserved is still close to 13.6 percentage points as in Model 1. Model 5 controls for the small difference in means between the reserved and unreserved village councils. To control for differences between caste groups in electing a woman, I control for caste group reservations. Since the seat allocation is based on lists sorted on population variables, I use demographic controls: total population, total households, the fraction of women to total population, the fraction of SC population to total population, the fraction of ST population to total population and the fraction of population under age 6 to total population. It might be the case that some villages elect women because the woman voters in these villages are active in the political process. To control for such factors, I add controls for the proportion of woman employed and for woman literacy. To control for the economic status of each village, I add controls for the proportion of households having access to well water, having electricity, owning a bike and using firewood as main source of cooking fuel. When these controls are included, the increase in the probability of a woman winning an unreserved seat in 2015 when the seat was reserved in 2010 is lower at 11 percentage points.

Table 7: Lasting effects - Council member position

	Woman win in 2015			
	(1)	(2)	(3)	(4)
reserved for woman in 2010	0.015 (0.013)	0.015 (0.013)	0.015 (0.013)	0.016 (0.013)
Constant	0.113*** (0.010)			
District FE		X		
Block FE			X	
Council FE				X
N	2,692	2,692	2,692	2,692
R sq.	0.000	0.027	0.027	0.249
Number of districts	3	3	3	3

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The dependent variable is an indicator which equals 1 if seat was won by women in 2015 else zero. The sample is unreserved council member seats in 2015 in three districts (Chatra, Dhanbad, and Deoghar). Controls include demographic, education, labor force and economic status observables shown Table 2.

I study if the persistent effect of quotas at village council head level is also observed at village council member level in Table 7. Since council member is a less prestigious position than head, we might expect different results. The estimates from model 1 indicate that women are 11.3% likely to win an unreserved seat in 2015 if the seat was *not* reserved in 2010. There is no statistically significant change in this probability if the seat was reserved in 2010. Models 2 and 3 use block and council fixed effects such that the seats within the same block and council respectively are compared. There is still no significant effect of 2010 seat reservation.

Thus, gender quotas at village council head position increase the probability of a woman winning, even when they are no longer binding by five times. However, these effects are not observed at village council member seats. One explanation for these contrasting results could be that there are bigger barriers to competing for head position than for member and reservation helps to bring down those barriers. This is also suggested by the large proportion of women winning on unreserved council member seats (12.6%) as compared to council head seats (3.3%). These results also contrast with Bhavnani (2017) who finds a five times increase in the probability of a woman winning a unreserved council member seat (3.7% to 21.6%). It is possible that in the council member seats in Bhavnani (2017) are prestigious and women face barriers that are negated by gender quotas.

This 13.6 percentage point increase due to quotas at council head position is substantial, considering the secular increase in the absence of quotas is less than 1 percentage point. This translates to an additional 275 women becoming council heads in 2015 (around 6% of total positions available) because of quotas.

7 Mechanism of lasting effects at council head position

7.1 Do village council observables explain the lasting effects?

I examine if village council observables explain the lasting effects observed at council head position. This is possible, for example, if high levels of women literacy is causing more women to win or literate women are electing women after the quotas are no longer binding. If this is true, women must be more likely to win unreserved seats in village councils that have more literate women as compared to those that do not. In a multiple regression framework, we can study these differential effects by interacting indicator variable X , that represents a “high” value of some village council observable to estimate the following model

$$woman_win_2015_{s,2015} = \beta_0 + \beta_1 * X_{2010} + \beta_2 * reserved_for_woman_2010_{s,2010} + \beta_3 * reserved_for_woman_2010_{s,2010} * X_{2010} + \epsilon_s \quad (3)$$

where β_1 indicates the probability of a woman winning an unreserved seat in 2015 when the seat was *not* reserved in 2010 in village councils with “high” level of observable X . β_3 indicates the change in probability of a woman winning an unreserved seat in 2015 with the seat was reserved in 2010 in village councils with “high” level of observable X .

Table 8 shows how the lasting effects vary by village observables. In model 1, I reproduce the baseline model for comparison with the rest of the models. In model 2, I study if the effects vary by women literacy. The probability of a woman winning an unreserved seat in 2015 when the seat was *not* reserved in 2010 is 4.7% in low women literacy areas. This probability lower by 2.2 percentage points in high women literacy areas, but the difference is not statistically significant. If the seat was reserved for a woman in 2010, the probability of a woman winning the seat increases by 14.1% in low women literacy areas. The increase is lower by 3.1 percentage points in high women literacy

areas, but the difference is not statistically significant. Thus, the probability of women winning an unreserved seat when the seat was/ was *not* reserved in 2010 does not vary with level of women literacy. This suggests that women literacy is likely not a mechanism for the lasting effects. In models 3-5, I use other observables as indicator variables. The probability of women winning do not vary with the level of women literacy, population, labor force participation, or economic status of the village council which suggests that these observables do not explain the lasting effects.

Table 8: Lasting effects by council observables

	Woman win in 2015				
	(1)	(2)	(3)	(4)	(5)
	baseline	X=High women literacy	X= High women proportion	X=High women LFP	X=High electricity proportion
Constant	0.033** (0.010)	0.047* (0.017)	0.033* (0.011)	0.030* (0.011)	0.050** (0.015)
X		-0.022 (0.023)	0.014 (0.024)	0.019 (0.021)	-0.025 (0.015)
reserved for woman in 2010	0.136*** (0.011)	0.141*** (0.024)	0.118*** (0.020)	0.119*** (0.023)	0.101*** (0.017)
reserved for woman in 2010 x X		-0.031 (0.052)	0.036 (0.029)	0.022 (0.038)	0.052 (0.026)
N	1,102	1,011	1,011	1,011	1,011
R sq.	0.044	0.044	0.042	0.042	0.041

Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The dependent variable is an indicator which equals 1 if seat was won by women in 2015 else zero. The sample is unreserved council head seats in 2015.

7.2 Can incumbency explain the lasting effects?

One factor that might have increased the probability of a woman win in the treated council seats is incumbency.¹⁹ The intuition is that there exists incumbency advantage and gender quotas in 2010 allows to have this advantage.

Incumbency advantage is an unobservable but a required condition is likelihood of repeat winners. To study the prevalence of repeat winners, Table 9 shows the raw incumbency rates by gender and reservation status of the village council head position. The first two rows indicate that the men and women incumbency rate on seats not subject to gender quotas in both rounds is quite similar (36% and 33% respectively). Comparing rows 2 and 4, it can be seen that having seat turn from reserved to unreserved does not increase female incumbency. If anything, it reduces women incumbency. Comparing rows 5 and 6, suggests that having a seat reserved for in both rounds increases women incumbency as compared to reserving the seat only in the first round. This could be because of more competition when the seat becomes unreserved or women in reserved seats in 2010 are not

¹⁹In the Indian context, studies have found presence of an incumbency disadvantage in both state (Uppal, 2009) and national elections (Linden, 2004), due to high levels of centralization within the political parties in India (Lee, 2020).

strong candidates that win election again. Interestingly, the seats twice reserved do not have a very high incumbency rate and is comparable to raw incumbency rates. This suggests that in this group, there is a churn in women candidates, which goes against the argument of shortage of women candidates. Row 5 is the treatment group that has incumbency rate of 12%, lower than treatment group. Rows 1 and 2 form our control group and the overall incumbency rate is close to 36%. Lastly, comparing rows 4 and 6 do not suggest reservation in round 2 help incumbency.

Table 9: Incumbency rates

Subject to gender quotas	Reserved for woman in 2010	Reserved for woman in 2015	Woman win in 2010	N	incumbents	incumbency rate
No	No	No	No	436	156	0.36
	No	No	Yes	12	4	0.33
2015	No	Yes	No	586	0	0
	No	Yes	Yes	16	4	0.25
2010	Yes	No	Yes	655	77	0.12
	Yes	Yes	Yes	607	179	0.3

$$\text{incumbency rate} = \text{incumbents}/N$$

To separate the possible woman incumbency effect from the total effect of quotas, I compare the number of non-incumbent women in the treatment and control groups. In Table 10 shows estimates of equation 2 but with the dependent variable as $\text{non_incumbent_woman}_{2015,s,2015}$, which equals 1 if a non-incumbent woman wins in village council v in 2015, else 0. Estimates from model 1 indicate that the probability of a non-incumbent woman winning an unreserved seat in 2015, when the seat was *not* reserved in 2010 was 2.5%. This probability increase by 2.8 percentage points if the seat was reserved for a woman in 2010. Thus, when the seat was reserved in 2010, the probability of a non-incumbent woman winning in 2015 is 5%, which is double the probability of a non-incumbent woman winning in 2015 when the seat is *not* reserved in 2010 (2.5%). In model 2, I add village councils from scheduled areas. This only increases the size of the treatment group since all these new councils were reserved for women previously. The probability of a non-incumbent woman winning a seat is now higher by 4.1 percentage points if the seat was reserved in 2010, suggesting that the scheduled areas are more likely to elect non-incumbent women. Controlling for district fixed effects (Model 3), block fixed effects (Model 4) and controls (Model 5) decreases the magnitude of the estimate and the effect is no longer significant.

Model 1 is the preferred model since it allows estimation of a meaningful intercept and the estimates are based on areas that are more likely to be similar. Thus the probability of a non-incumbent woman winning an unreserved seat in the next election is two times higher if the seat was reserved in the previous election, as compared to when it was not. This entry of “new” women into politics due to quotas suggests a weakening of gender stereotypes against women. The weakening of gender stereotypes is also probable given that the setting examined is a largely woman-disadvantaged area

Table 10: Lasting effects - non-incumbent women

	Non-incumbent woman win in 2015				
	(1)	(2)	(3)	(4)	(5)
reserved for woman in 2010	0.027 (0.014)	0.041** (0.011)	0.027* (0.013)	0.023 (0.013)	0.015 (0.016)
Constant	0.025* (0.009)	0.033* (0.012)			
District FE			X		
Block FE				X	X
Controls					X
Scheduled areas		X	X	X	X
N	1,102	2,093	2,093	2,093	1,936
Treat	654	1,607	1,607	1,607	1,496
Control	448	486	486	486	440
R sq.	0.005	0.005	0.046	0.159	0.175

Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The dependent variable is an indicator which equals 1 if a non-incumbent woman wins in 2015, else 0. The sample is unreserved seats in 2015. Controls include demographic, education, labor force and economic status observables shown Table 2.

where one would expect strong stereotypes, and such effects have been found in the literature.²⁰

7.3 When do quotas help?

Across the analysis, the size of effect of quotas in the next/current election is inversely proportional to the likelihood of women winning seats not subject to quotas. For example, at the council head position, when women are 3.3% likely to win seats not subject to quotas, the lasting effect of quotas is 13.6 pp. But at the council member position, when women are 11.3% likely to win seats not subject to quotas, there is no effect of quotas. Likewise, there are no downstream effects are observed at deputy council head position and council member positions, where women are winning 43% and 62% of seats not subject to quotas. One explanation could be that quotas are useful when women are unable to win in their absence and their marginal effect decreases with number of women winning in absence of quotas.

8 Conclusion

Using a newly compiled data on reserved seat quotas for women in village councils in the Indian state of Jharkhand for two consecutive elections (2010 and 2015), I examine a number of issues related to the contemporaneous and lasting effects of electoral gender quotas.

For contemporaneous effects, I find that gender quotas reduce electoral competitiveness, but only in the first round of elections. Gender quotas do not affect the caste composition of the winning candidates, nor do they have any spillover effects on other lower hierarchy positions in the council. For lasting effects, I find that village councils head positions subjected to mandated reserved seat

²⁰Beaman et al. (2009) finds that in village councils exposed to gender quotas, voters are more favorable to woman village council head as compared to those which have not been exposed to gender quotas.

quotas continue to elect more women as compared to those not subjected to the quotas, even after the quotas are no longer binding. The lasting effects are not observed at the council member positions. To explain the strong lasting effects, I explore possible mechanisms. Women literacy, women proportion, women labor force participation and income explain do not explain the lasting effects observed at the council head position. There is suggestive evidence that incumbency advantage gained through gender quotas might play a role. A weakening of gender stereotypes against women likely contributes to the lasting effects.

The results suggest that quotas are useful when women are unable to win in their absence. That is they do not have an additional effect when women are already winning in significant numbers. Since the next-election effects are positive, it is reasonable to expect similar effects in the long run. Hence, even temporary quotas can be effective policy tools to increase long-run representation, which is one of the primary objectives of such quotas. The lasting effects also suggest that at least a part of discrimination faced by women is statistical, which can be remedied by quota-like policy interventions. This is pertinent for temporary affirmative action policies addressing other forms of discrimination.

References

- Afridi, F., Iversen, V., and Sharan, M. R. (2017). Women Political Leaders, Corruption, and Learning: Evidence from a Large Public Program in India. *Economic Development and Cultural Change*, 66(1):1–30.
- Auerbach, A. M. and Ziegfeld, A. (2020). How do electoral quotas influence political competition? evidence from municipal, state, and national elections in india. *The Journal of Politics*, 82(1):397–401.
- Bakshi, D. P. (2010). Jharkhand: Towards Panchayat Polls.
- Beaman, L., Chattopadhyay, R., Duflo, E., Pande, R., and Topalova, P. (2009). Powerful Women: Does Exposure Reduce Bias? *The Quarterly Journal of Economics*, 124(4):1497–1540.
- Bertrand, M., Black, S. E., Jensen, S., and Lleras-Muney, A. (2018). Breaking the Glass Ceiling? The Effect of Board Quotas on Female Labour Market Outcomes in Norway. *The Review of Economic Studies*, 86(1):191–239.
- Bhalotra, S. and Clots-Figueras, I. (2014). Health and the political agency of women. *American Economic Journal: Economic Policy*, 6(2):164–197.
- Bhavnani, R. R. (2009). Do Electoral Quotas Work after They Are Withdrawn? Evidence from a Natural Experiment in India. *American Political Science Review*, 103(1):23–35.
- Bhavnani, R. R. (2017). Do the Effects of Temporary Ethnic Group Quotas Persist? Evidence from India. *American Economic Journal: Applied Economics*, 9(3):105–23.
- Bose, N. and Das, S. (2017). Political Reservation for Women and Delivery of Public Works Program. *Review of Development Economics*.
- Campbell, D. E. and Wolbrecht, C. (2006). See Jane Run: Women Politicians as Role Models for Adolescents. *The Journal of Politics*, 68(2):233–247.
- Cassan, G. and Vandewalle, L. (2021). Identities and public policies: Unexpected effects of political reservations for women in India. *World Development*, 143:105408.
- Chattopadhyay, R. and Duflo, E. (2004). Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica*, 72(5):1409–1443.
- Chaturvedi, S., Das, S., Mahajan, K., et al. (2021). The importance of being earnest: What explains the gender quota effect in politics? Technical report.
- Chaudhuri, S. (2006). What difference does a constitutional amendment make?: The 1994 Pan-

-
- chayati Raj Act and the attempt to revitalize rural local government in India. *Decentralization and Local Governance in Developing Countries*, pages 153–201.
- Clayton, A. (2015). Women's Political Engagement Under Quota-Mandated Female Representation: Evidence From a Randomized Policy Experiment. *Comparative Political Studies*, 48(3):333–369.
- Clots-Figueras, I. (2012). Are female leaders good for education? evidence from india. *American Economic Journal: Applied Economics*, 4(1):212–44.
- Dahlerup, D., Hilal, Z., Kalandadze, N., and Kandawasvika-Nhundu, R. (2013). *Atlas of Electoral Gender Quotas*. IDEA.
- Das, S., Mukhopadhyay, A., and Saroy, R. (2017). Efficiency consequences of affirmative action in politics: Evidence from India.
- Dollar, D., Fisman, R., and Gatti, R. (2001). Are women really the “fairer” sex? Corruption and women in government. *Journal of Economic Behavior & Organization*, 46(4):423–429.
- Gould, J. A., Kulik, C. T., and Sardeshmukh, S. R. Trickle-down effect: The impact of female board members on executive gender diversity. *Human Resource Management*, 57(4):931–945.
- Government of India (2015). LGD - Local Government Directory.
- Goyal, T. (2020a). How Women Mobilize Women Into Politics: A Natural Experiment in India. Available at SSRN 3583693.
- Goyal, T. (2020b). Local female representation as a pathway to power: A natural experiment in India. Available at SSRN 3590118.
- Indiawater. Indiawater. http://indiawater.gov.in/imisreports/Reports/Alert/rpt_RWS_diffNoWithCensus2011Vill_S.aspx?Rep=0&RP=Y. Retrieved on February 5, 2018.
- Inter-Parliamentary Union (2019). Women in Parliaments: World Classification.
- Iyer, L., Mani, A., Mishra, P., and Topalova, P. (2012). The Power of Political Voice: Women's Political Representation and Crime in India. *American Economic Journal: Applied Economics*, 4(4):165–93.
- Joy, M. (2016). Electoral Quotas for Women: An International Overview.
- Karekurve-Ramachandra, V. (2020). Gender Quotas and Upward Political Mobility in India.
- Karekurve-Ramachandra, V. and Lee, A. (2020a). Can Gender Quotas Improve Public Service Provision? Evidence from Indian Local Government.

-
- Karekurve-Ramachandra, V. and Lee, A. (2020b). Do Gender Quotas Hurt Less Privileged Groups? Evidence from India. *American Journal of Political Science*, 64(4):757–772.
- Kumar, G. (2001). Panchayat Elections: Overcoming State's Resistance. *Economic and Political Weekly*, Vol. 36(Issue No. 20).
- Lee, A. T.-G. (2020). Incumbency, Parties, and Legislatures: Theory and Evidence from India. *Comparative politics*, 52:311–331.
- Linden, L. L. (2004). Are incumbents really advantaged? The preference for non-incumbents in Indian national elections. *Unpublished paper*.
- Maitra, P. and Rosenblum, D. (2021). Upstream effects of female political reservations. *European Journal of Political Economy*, page 102061.
- Moyna (2010). Spoils of local bodies.
- O'Connell, S. D. (2020). Can Quotas Increase the Supply of Candidates for Higher-Level Positions? Evidence from Local Government in India. *The Review of Economics and Statistics*, 102(1):65–78.
- Rai, P. (2011). Electoral participation of women in india: Key determinants and barriers. *Economic and political weekly*, pages 47–55.
- Sekhon, J. S. and Titiunik, R. (2012). When Natural Experiments Are Neither Natural nor Experiments. *American Political Science Review*, 106(1):35–57.
- Supreme Court of India (2010). Civil appeal nos. 484-491 of 2006, Union of India versus Rakesh Kumar and Ors.
- Swamy, A., Knack, S., Lee, Y., and Azfar, O. (2001). Gender and corruption. *Journal of Development Economics*, 64(1):25–55.
- Uppal, Y. (2009). The disadvantaged incumbents: estimating incumbency effects in Indian state legislatures. *Public Choice*, 138(1):9–27.
- World Bank Group (2018). *Women, Business and the Law 2018: Getting to Equal*. World Bank.

A Randomization

A.1 Randomization mechanism in the first election - non-scheduled areas

The mechanism for deciding which village council seats will be subject to gender quotas is outlined in the Jharkhand Panchayat Nirvachan Niyamavali, 2001 (JPNN), which are the rules made by the Jharkhand state and are applicable to all the rural local governing bodies in the state. The mechanism is similar to one described in Chattopadhyay and Duflo (2004), who also exploit the type of quasi-randomization that I use here.

The process of reserving village council head seats for SC, ST, OBC and women in the first elections in 2010 can be explained with the help of a numerical example. I first describe the nomenclature used to describe the process.

- Each village council head seat can be subject to a caste quota, i.e. it can be reserved for either SC, ST, OBC or not reserved for any caste group. I define a seat not reserved for any caste group as an “open” seat. A seat reserved for SC (or ST or OBC) can only be contested by SC (or ST or OBC), while an open seat can be contested by anybody, including SC, ST and OBC.
- Each village council head seat can also be subjected to a woman quota i.e. it can be reserved for women or not. I define a seat not reserved for women as unreserved (UR). A seat reserved for women can be only contested by a woman while an UR seat can still be contested by women.
- If the seat is subjected to both quotas, I will address it as SC-F, ST-F and OBC-F. These seats can only be contested by women belonging to SC, ST and OBC respectively.
- A “reserved seat” is a village council head seat subjected to woman quota.
- A “de-reserved seat” is one which was reserved in 2010 and not in 2015

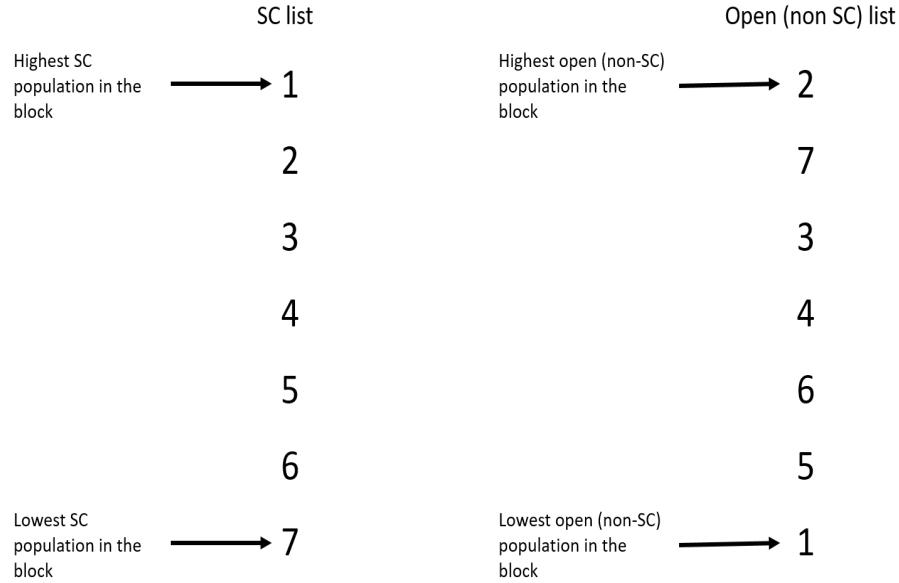
Say there are 7 village councils in a non-scheduled block. For simplicity, I will assume that there is only one caste group for which seats are to be reserved: Scheduled Castes (SC).²¹ Also, say the SC constitute 3/7 of the population in the block, which implies 3 village council seats are to be reserved for SC and the rest are to be kept open. As per the rules, at least 50% of SC seats and open seats are reserved for women. Exactly which seats are to be reserved is determined as follows.

Two lists are prepared. In the SC list, all the village councils are ordered in descending order based on SC population. In the open list, all the village councils are ordered in descending order based on the non-SC population. The ranked lists are shown in Figure 1.

Starting from top of the list, the village councils are reserved for SC or kept open and reserved for

²¹This can happen if the block has a negligible population of STs and OBCs

Figure 1: Ranked lists



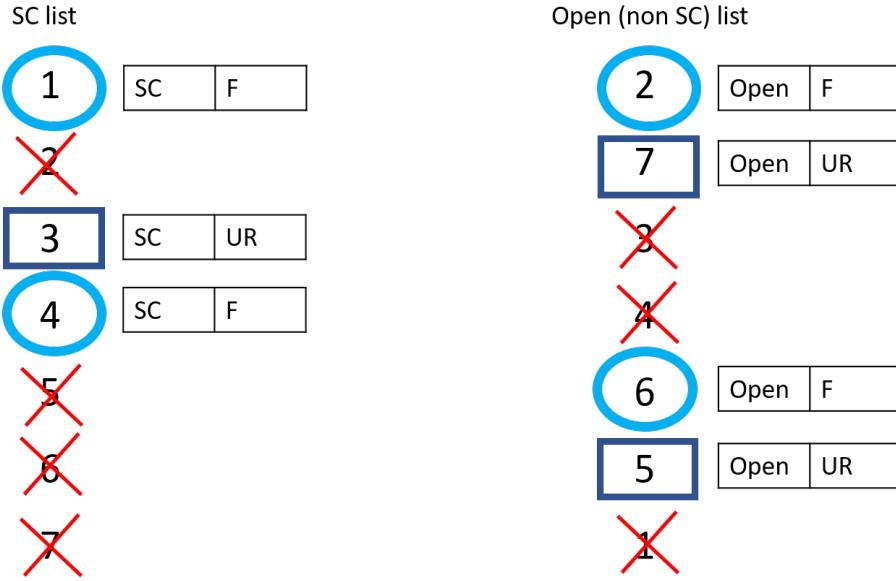
woman or kept unreserved in iterations such that (i) in each iteration, one seat is reserved for SC and kept open respectively and (ii) in odd iterations seats are allotted to women of the respective group. This is how the allocation would work in our example (VC = village council)

- Iteration 1: VC1 from the SC list is reserved for an SC woman (SC-F) in Figure 2. VC2 from the Open list is kept open but reserved for woman (Open-F).
- Iteration 2: VC3 from the SC list is reserved for SC (SC-UR) and VC7 from the Open list is not reserved for SC (Open-UR). Since this is an even numbered iteration, neither seat is reserved for women.
- Iteration 3: VC4 from the SC list is reserved for a SC woman (SC-F). VC6 from the Open list is kept open but reserved for woman (Open-F).
- Iteration 4: Since the required number of seats (3) have been reserved for SC, no seat is reserved for SC in this iteration. VC5 from the Open list is kept open (Open-UR).

Open seats can still be contested by SC, but the seats reserved for SC can only be contested by SC. The allocation mechanism has resulted in village councils 1, 4, 2 and 6 being reserved for women, while village councils 3, 7 and 5 are not reserved for women.

I first argue that the seats reserved for women and those not reserved for women are similar in terms of probability of electing a woman. One way to see this is to focus on one list at a time in Figure 2. Consider SC list. Controlling for population of SC (on the basis of which the list is ordered), it is plausible that village councils 1, 3 and 4 are similar on average. Effectively, village council 3 is acting as a control observation for treated village councils 1 and 4. Thus, the identification relies on finding such treated-control village councils in each list.

Figure 2: Seat allocation example



The figure shows the seats reserved for Scheduled Caste (SC) and not reserved for Scheduled Caste (Open). Also, if the seat is reserved for women (F) or unreserved (UR).

The difference between this simplified example and the actual process is that instead of two lists, there are generally four lists (one each for SC, ST, OBC and Open). Also, the lists are longer (an average of 17 village councils in each block). I can make the same argument regarding the similarity of reserved and unreserved seats with these changes. The example establishes that the seats reserved for women are similar to those that are not. In the next section I show that when repeating a similar procedure in the next election, some seats are reserved for women and some unreserved, and those are also similar to each other.

The mechanism I describe is similar to the one discussed by Chattopadhyay and Duflo (2004). The only difference is that in Figure 2 instead of allotting seats in iterations, in their setting the top 3 seats (VC1, 2 and 3) in SC list will be allotted to SC. And from these seats, starting from the first seat, every third seat will be reserved for SC-woman (VC1).²² In the open list, after excluding seats reserved for SC, the top 4 seats (VC7, 4, 6 and 5) will be kept open. And from these seats, starting from the first seat, every third seat will be reserved for Open-woman (VC7 and 5).

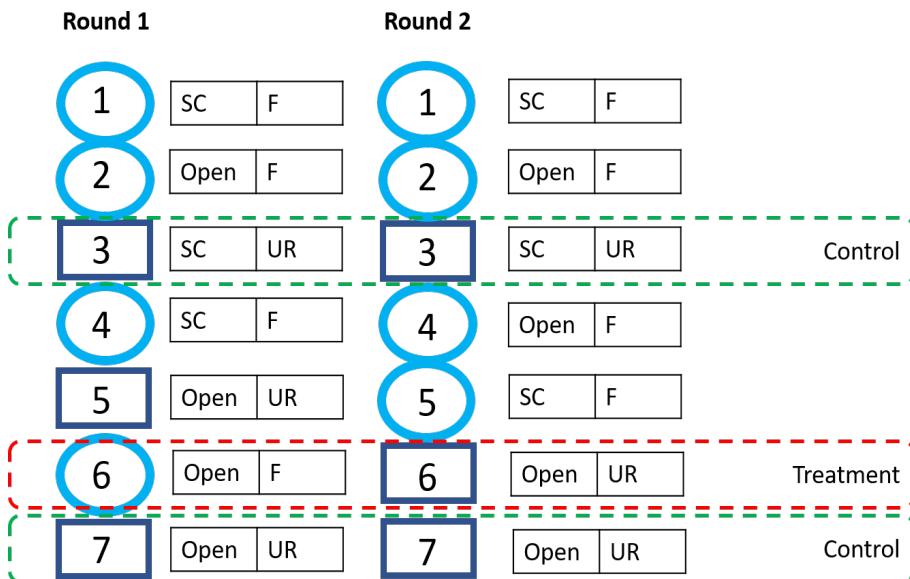
The reserved seats can be higher than the mandate of 50%. If there are odd number of seats reserved for a caste group, ensuring that seats reserved for women of that caste group is at least 50% may lead to a higher proportion of seats reserved for women.

²²Only one-third of seats are reserved for women

A.2 Randomization mechanism in the second election - non-scheduled areas

There is one change between the first and second election allocations in the order of allocation in each iteration. While in the first election, in each iteration, a seat is first allotted in the SC list and then one in the open list, in the second election for each iteration, a seat is first allotted in the Open list and then one in the SC list. The rest of the process follows the same steps as in the first election. This will result in the allocations in which village councils 2, 4, 1 and 5 are reserved for women and village councils 7, 6 and 3 are not reserved for women. As in the first election, the village council seats reserved for women and those that are not reserved are similar within a group and overall in terms of electing a woman. I have thus established that the seats reserved for women are similar to those that are not also in the second election.

Figure 3: Defining treatment and control groups



A.3 Combining two elections - defining treatment and control groups

Figure 3 shows the status of reservations for each of the 7 village councils in both elections. In studying the effect of seat reservations in the next election, I define treated council seats as those reserved for women in the first election and not in the second election, while the control village council seats are those that were never reserved. Since village council 6 was reserved in the first election but subsequently was “de-reserved”, it becomes a treated village council seat. Village council seats 3 and 7 were never reserved, so they are control village council seats. Their similarity follows from the fact that allocations in each election are quasi random and there is no dependence between them. In regression models, I will nevertheless include controls to allay fears of endogeneity.

A.4 Randomization in scheduled areas

Roughly half of the 4300 village councils in the state are in scheduled areas. The process of reserving seats for women in these village councils work differently than that in non-scheduled areas. In these areas, all the village councils in each block are arranged in decreasing order of their total population. All the village council head positions are reserved for Scheduled Tribes. In the first election, odd numbered village council head positions are reserved for women belonging to Scheduled Tribes. In the second election, the even numbered village council head positions are reserved for women belonging to Scheduled Tribes. Notice that all the unreserved seats in the second election in these areas were reserved for women in the previous election. So they are all “treated” seats with no comparable “control” seats. Given the different demographic characteristics of these areas as compared to non-scheduled areas, it may not be reasonable to combine them with non-scheduled areas. Hence, I will not use these seats in the summary statistics and main model but only in the robustness checks.

B Eleventh Schedule - List of functions to be devloved to local government bodies

1. Agriculture, including agricultural extension.
2. Land improvement, implementation of land reforms, land consolidation and soil conservation.
3. Minor irrigation, water management and watershed development.
4. Animal husbandry, dairying and poultry.
5. Fisheries.
6. Social forestry and farm forestry.
7. Minor forest produce.
8. Small scale industries, including food processing industries.
9. Khadi, village and cottage industries.
10. Rural housing.
11. Drinking water.
12. Fuel and fodder.
13. Roads, culverts, bridges, ferries, waterways and other means of communication.
14. Rural electrification, including distribution of electricity.
15. Non-conventional energy sources.
16. Poverty alleviation programme.
17. Education, including primary and secondary schools.
18. Technical training and vocational education.
19. Adult and non-formal education.
20. Libraries.
21. Cultural activities.
22. Markets and fairs.
23. Health and sanitation, including hospitals, primary health centres and dispensaries.
24. Family welfare.
25. Women and child development.
26. Social welfare, including welfare of the handicapped and mentally retarded.
27. Welfare of the weaker sections, and in particular, of the Scheduled Castes and the Scheduled Tribes.
28. Public distribution system.
29. Maintenance of community assets.

C Implementation of PR Act in Scheduled Areas

The constitution of India identifies certain areas predominantly populated by various tribes under the Fifth and Sixth Schedule, commonly known as fifth and sixth schedule areas.²³ These areas are identified separately mainly for the protection of the cultural distinctiveness of the tribals and are composed of multiple tribes each having its own governance system. In these areas, the governor has special powers and the locals have a larger autonomy over administration of these areas. These areas are notified through presidential orders from time to time.²⁴ The latest order that affected the scheduled areas in the state of Jharkhand came on April 11, 2007.

The Panchayati Raj Act of 1993 was not applicable to scheduled areas, but the Parliament of India reserved the right to extend the Act to these areas in the future. To achieve this objective, the Government of India constituted a Committee under the chairmanship of Shri Dilip Singh Bhuria in 1994, popularly called the “Bhuria Committee”, to examine various dimensions of self-rule for tribes and to make recommendations for extending the provisions of Part IX of the Constitution to the Scheduled Areas. On the basis of the Bhuria Committee report submitted in 1995, the Parliament enacted the Provisions of the Panchayats (Extension to the Scheduled Areas) (PESA) Act, 1996 for its applicability to Fifth Schedule Areas as per article 243M of the Constitution.

PESA advised state governments to extend the PR Act of 1993 to the scheduled areas and ensured that certain rights shall continue to be held by the tribes. Two important recommendations of the PESA related to the powers of local bodies in the scheduled areas and the reservation of seats for scheduled tribes. It recommended additional powers to the councils as compared to the non-scheduled areas. Also, it mandated that in the scheduled areas at least fifty percent of village council members are to be from the tribal population and (ii) all seats of chairpersons of panchayats at all levels shall be reserved for scheduled tribes.

In Jharkhand 13 out of 24 districts are identified as scheduled areas where PESA provisions were applicable. These districts have a large population of Scheduled Tribes. In these districts, all the village council seats are reserved for Scheduled Tribes, and at least 50% of these are reserved for Scheduled Tribes women. The allocation of reserved seats for women also work differently here. In the first round, all odd numbered village councils in a block are reserved for women. In the second round, the remaining half is reserved for women. Hence almost all the seats switch between being reserved in one round and not in another or vice versa. Hence, in these regions, the next round reservation of the seat is perfectly predictable.

Table 11 shows the distribution of seats. More than 900 seats switch from being reserved to not reserved and vice versa. There are 113 seats that are reserved in both rounds.²⁵

²³Much of the content here comes from http://pesadarpan.gov.in/en_US/legislations

²⁴most likely depending on changing population of tribals in these areas

²⁵These are the cases when there are odd numbered village councils in a block and to ensure that seats reserved

Table 11: Reserved seats in Scheduled Areas

Reserved for woman in 2010	Reserved for woman in 2015	obs
0	1	926
1	0	934
1	1	113

for woman do not fall below 50%, in the second round one odd numbered seat is reserved for female in addition to all even numbered seats. This leads to some odd numbered seats getting twice reserved.

D Delay of first Panchayati Raj elections in Jharkhand

There are a few reasons why the the first round of village council elections, and the reservations in them, were delayed in the state. The first part of the delay happened before the formation of the new state, when it was part of Bihar. Although Bihar had amended its Panchayati Raj Act in 1993 (Bihar Panchayati Raj Adhiniyam 1993), elections could not happen until 2000 when Jharkhand was carved out as a seperate state. Then the delay was due to pending cases in courts related to provision of Other Backward Caste (OBC) reservation.²⁶ After a final intervention by the Patna High Court, the Bihar elections were held in 2001 by which time Jharkhand was a separate state.

After its separation from Bihar, Jharkhand promptly amended its state laws in 2001 (The Jharkhand Panchayat Raj Act, 2001) to conform with the federal PR Act. Since a large area of the state was classified as a scheduled areas, the state act also incorporated provisions of the PESA. The act provided that all council heads and at least 50% of council member positions in scheduled areas were to be reserved for Scheduled Tribes. Additionally, it allowed for reservation of up to 30% of seats for Scheduled Castes and Other Backward Classes. There were numerous cases filed in high court against these provisions of reservations, which was the main reason for the delay in the first round of elections. The petitioners argued that in some of the scheduled areas, the population of tribals was less than 50% and in some cases as low as 20% and hence the mandatory reservation for tribals was unfair. It is also claimed that the Jharkhand state government deliberately delayed elections under the guise of issues like delimitation of constituencies, reservations, revisions of voter's lists, national assembly elections, rain, drought and even festivals. The highest court in the state, Ranchi high court, ruled that 100% reservations for the positions of council head and up to 80% in council members in scheduled areas were unconstitutional. The federal government went to the nation's top court, the Supreme court, against this ruling where it was overturned by the Supreme court in January 2010 and the court instructed the State Election Commission to conduct elections as soon as possible (Supreme Court of India (2010)). There was also pressure from the central government to institute rural local bodies to ensure smooth flow of Mahatma Gandhi National Rural Employment Guarantee Act (NREGA) funds. Consequently, the first round of elections happened in December 2010.

²⁶Kumar (2001)

E Location of Jharkhand state

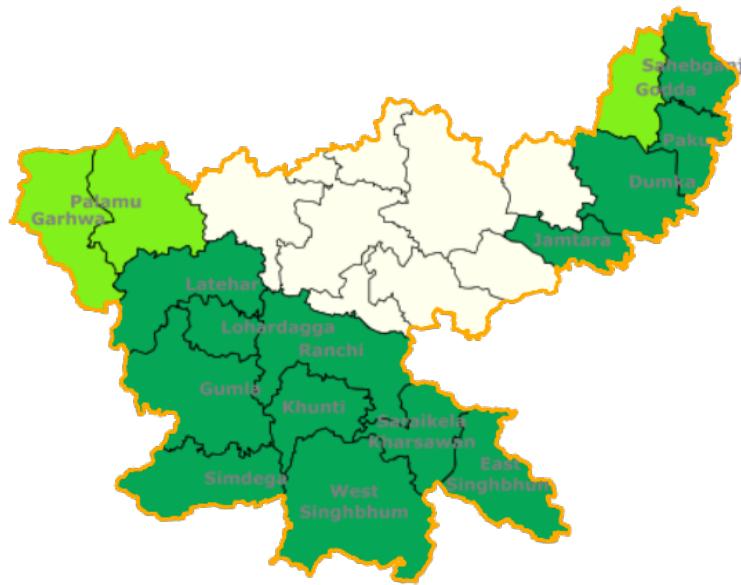
Figure 4: Map of Jharkhand



The map highlights the state of Jharkhand in India, whose village councils are used for the analysis in the paper.
Source: Google Maps.)

F Scheduled areas in Jharkhand

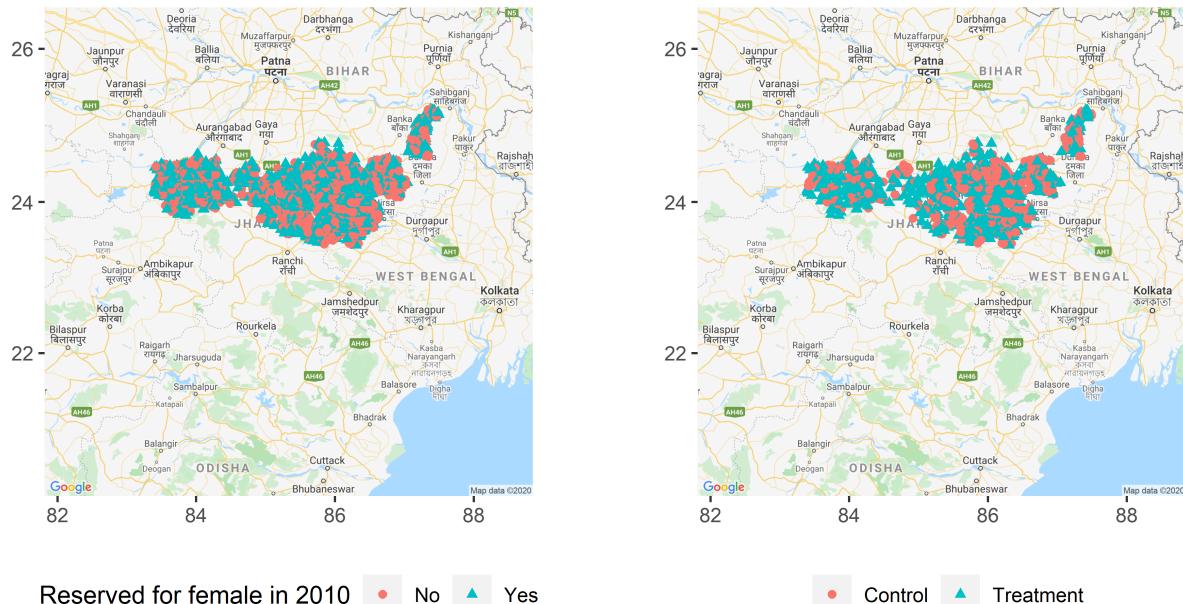
Figure 5: Scheduled areas in Jharkhand



The map highlights the scheduled area districts in the state of Jharkhand. The districts highlighted in dark green (13) are fully covered while those in green (3) are partly covered. Source: http://pesadarpan.gov.in/en_US/fifth-schedule-areas The analysis in the paper focuses on the village councils in the non-scheduled areas (all non-green areas and parts of light green areas)

G Spatial distribution of village councils

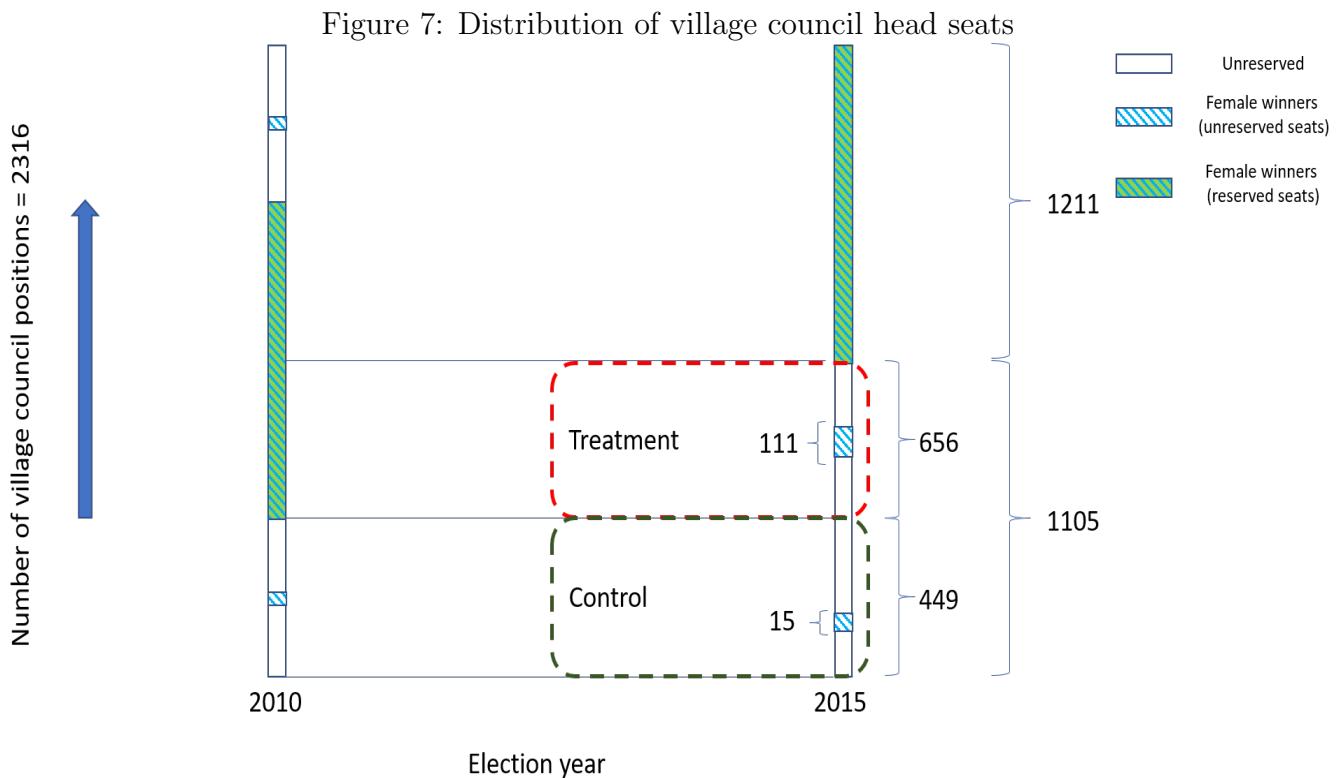
Figure 6: Spatial distribution of village councils



The maps show the spatial distribution of village councils reserved for women. Each point corresponds to the location of village council office. On the left, all the village councils (approx 2300) are shown. On the right, only those village councils used in the main model are shown (approx 1000 councils - unreserved in 2015)

H Estimation strategy - Lasting effects

Identification is best understood from Figure 7 which shows the distribution of village council head seats in elections in 2010 and 2015. The horizontal axis has election years and the vertical axis has the number of village council head seats. The seats are arranged in such a way that a horizontal line starting from a seat in 2010 would reach the same seat in 2015. Notice that the height of bars is similar in both rounds indicating that the total number of seats were similar. The non-shaded seats are not reserved for women, while the shaded seats are reserved for women. In each round, around 50% of seats are quasi-randomly reserved for women, which I have grouped together for clarity. Seats won by women are highlighted by back slashes. As can be seen from the figure, women always win on seats reserved for them. Sometimes, women win on unreserved seats.



Since I am interested in studying the effect of quotas on the probability of winning in the next election, I define the treatment and control group as follows: The treatment group is composed of seats reserved for women in 2010 and not reserved in 2015. The control group is composed of seats not reserved for women in 2010 and 2015. To obtain the causal estimate of quotas, I compare the proportion of women winning in treatment and control groups in 2015.²⁷ The quasi-randomization in 2010 ensures that in this restricted sample, some seats were reserved while the others were unreserved in 2010. Thus, the sources of identifying variation is the quasi-random allocations of

²⁷Since seats are quasi-randomly reserved for women in 2010 and 2015, restricting the sample to unreserved seats in 2015 should not lead to sample selection issues.

reserved seats to women in 2010 and 2015.

Table 12 previews the results by showing the distribution of women winning on unreserved seats in 2015. The overall probability of women winning on an unreserved seat is 11.4% (126/1,102). This probability is 3.3% (15/448) when the seat was unreserved in 2010 and increases to 17% (111/654) when the seat was reserved in 2010.

Table 12: Winners of unreserved seats in 2015

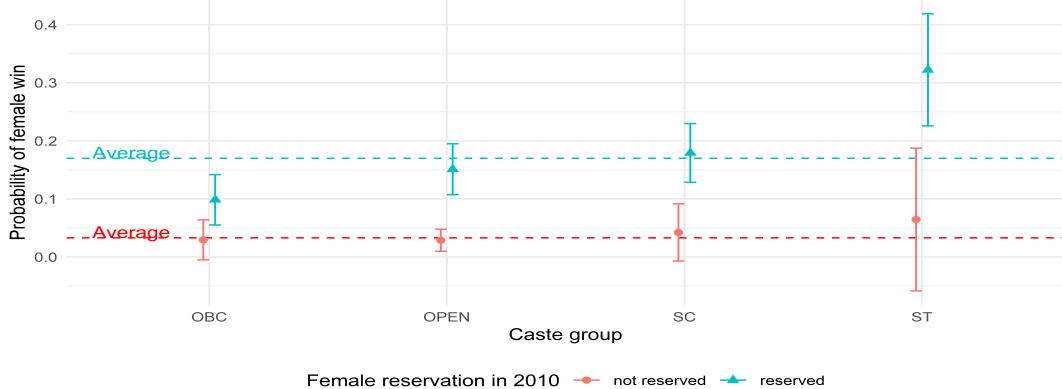
		woman won in 2015		
Reserved for woman in 2010		No	Yes	Total
No		433	15	448
Yes		543	111	654
Total		976	126	1102

I Heterogeneity

I.1 Caste heterogeneity of effect

I am interested in understanding if the lasting effect is a gender effect or a caste effect. I address this in two ways. First I ask if reserving seat for SC female has the same effect as ST female and so on. I interact the explanatory variable with caste indicators. The probability of *any* women winning in second round depends on whether the seat was reserved for women of particular caste group. Women are more likely to win a seat if it was reserved for ST women and less likely to win if it was reserved for OBC women. There is clearly a difference suggesting that caste and gender has distinct effect.

Figure 8: Caste heterogeneity of effect



The figure shows the probability of woman winning an unreserved seat in 2015 by the reservation status of the seat in 2010 across different caste groups. The red circles represent the probability of woman winning an unreserved seat in 2015, if the seat was not reserved for corresponding caste group in 2010. The blue triangles represent the probability of woman winning an unreserved seat in 2015, if the seat was reserved for corresponding caste group woman in 2010. The horizontal lines indicate the average probabilities for all caste groups. The error bars show the 95% confidence interval of the estimate.

Council head seats are first reserved for caste groups and then for women of the group. I study if these caste group reservations have any separate effects on the woman winning probability. We saw that having a seat reserved for a woman increases the probability of woman winning by an average of 13.6 percentage points. I now ask if the effect is different for women belonging to different caste groups. Is the increase in the probability of a woman winning the same if the seat was reserved for SC-woman, as compared to Open-woman?

Figure 8 shows the magnitude of the effect by caste groups. The effect is smallest for OBC-woman and highest for ST-woman. This can be interpreted as: The increase in probability of *any* woman winning on an unreserved seat is smallest if the seat was reserved for an OBC-woman and largest if the seat was reserved for a ST-woman.²⁸ Since I argue that these next-election effects come from

²⁸There is also a correlation between seats won by women on unreserved seats and the size of the effect. The groups which had smaller number of women winning on unreserved seats seem to have the smallest effect.

the breaking of stereotypes, the distance between the triangle and the circle in Figure 8 can be interpreted as the extent to which a stereotype was broken. Thus, the results for OBC women show the smallest effect in breaking stereotypes while the result for ST women show the strongest effect. If ST-women have the worst stereotypes, it is possible that breaking them has the biggest effect. Unfortunately, lack of data prevents me from testing this hypotheses directly.

Table 13 presents regression estimates corresponding to the Figure 8. The models are analogous to those in Table 6. They indicate that the caste heterogeneity in effects of quotas are robust to adding controls. The coefficients on the interaction terms indicate the differential effects of woman quotas by caste group. As suggested by Figure 8, the coefficients on the OBC and ST interaction terms have different signs and are statistically significant at the 10% level of confidence. The OBC interaction term coefficient indicates that women are less likely to get elected on an unreserved seat if the seat was previously reserved for an OBC-woman *as compared to it being reserved for Open-woman*.

Table 13: Caste Heterogeneity

	(1)	(2)	(3)	(4)	(5)
reserved for woman in 2010	0.122*** (0.022)	0.122*** (0.025)	0.122*** (0.025)	0.108* (0.035)	0.097** (0.032)
reserved for woman x SC in 2010	0.015 (0.036)	0.019 (0.049)	0.019 (0.049)	0.014 (0.057)	0.019 (0.054)
reserved for woman x ST in 2010	0.135 (0.071)	0.133 (0.066)	0.133 (0.066)	0.137 (0.065)	0.116* (0.052)
reserved for woman x OBC in 2010	-0.053* (0.023)	-0.053* (0.018)	-0.053* (0.018)	-0.056* (0.023)	-0.041 (0.022)
reserved for SC in 2010	0.014 (0.025)	0.016 (0.040)	0.016 (0.040)	0.034 (0.052)	0.029 (0.047)
reserved for ST in 2010	0.036 (0.065)	0.035 (0.060)	0.035 (0.060)	-0.008 (0.092)	0.026 (0.077)
reserved for OBC in 2010	0.001 (0.015)	-0.005 (0.019)	-0.005 (0.019)	0.014 (0.017)	0.001 (0.018)
Constant	0.029* (0.009)				
District FE	No	No	No	No	No
Block FE	No	Yes	Yes	Yes	Yes
Controls	No	No	No	Yes	Yes
Scheduled areas	No	No	No	No	Yes
N	1,102	1,102	1,102	1,011	1,936
R sq.	0.070	0.189	0.189	0.217	0.215

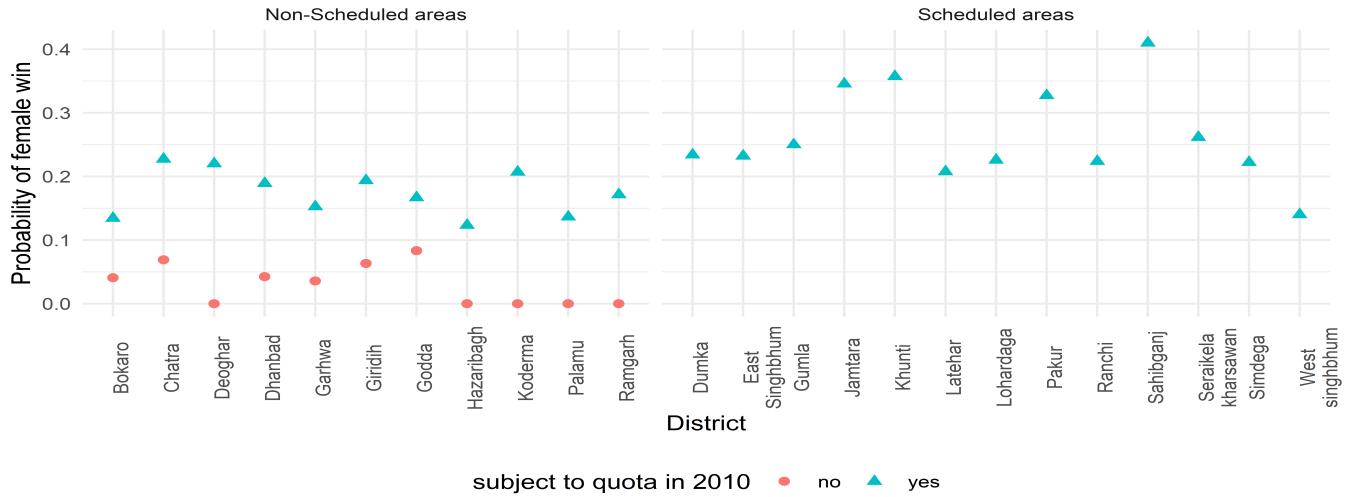
Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The dependent variable is an indicator which equals 1 if women won in 2015, else 0. The sample is unreserved seats in 2015. Standard errors (clustered by district) in parentheses. Open is the omitted category. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

I.2 Regional heterogeneity of effect

Figure 9: Regional heterogeneity of effect



The figure shows the probability of woman winning an unreserved seat in 2015 by the reservation status of the seat in 2010 across different districts. The red circles represent the probability of woman winning an unreserved seat in 2015, if the seat was not reserved for woman in 2010. The blue triangles represent the probability of woman winning an unreserved seat in 2015, if the seat was reserved for woman in 2010. The horizontal lines indicate the average probabilities for all districts. The error bars show the 95% confidence interval of the estimate.

To further examine if the effects are driven by certain districts, I estimate the coefficients for all districts separately, which shows the probability of woman winning an unreserved seat in 2015 depending on whether the seat was reserved in 2010. I plot the coefficients in Figure 9.²⁹ The scheduled areas (always reserved for ST and where all the seats were in treated group), are shown to the right of the figure. The probability of female winning an unreserved seat in these areas seem to be higher than in non-scheduled areas. While there is some heterogeneity across districts, the effects are not much different suggesting that the effects are not driven by some districts. For five districts (Deoghar, Hazaribagh, Koderma, Palamu and Ramgarh), women win an unreserved seat *only* if it was reserved in the previous election. In other words, women do not win seats if it was not reserved in the previous election.

²⁹ Corresponding regression results are presented in Table 14 in Appendix I.2. The coefficients on the interaction terms indicate the differential effects of woman quotas by district.

Table 14: Regional Heterogeneity

	(1)
reserved for woman in 2010	0.094 (0.059)
reserved for woman in 2010 x chatra	0.065 (0.095)
reserved for woman in 2010 x deoghar	0.126 (0.089)
reserved for woman in 2010 x dhanbad	0.053 (0.083)
reserved for woman in 2010 x garhwa	0.023 (0.093)
reserved for woman in 2010 x giridih	0.037 (0.076)
reserved for woman in 2010 x godda	-0.010 (0.092)
reserved for woman in 2010 x hazaribagh	0.030 (0.083)
reserved for woman in 2010 x koderma	0.113 (0.106)
reserved for woman in 2010 x palamu	0.043 (0.081)
reserved for woman in 2010 x ramgarh	0.078 (0.101)
Constant	0.041 (0.045)
District FE	No
Block FE	No
Controls	No
Scheduled areas	No
N	1,102
R sq.	0.055

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The dependent variable is an indicator which equals 1 if women won in 2015, else 0. The sample is unreserved seats in 2015. Standard errors in parentheses. Bokaro is the omitted category. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

J Caste and gender interaction

For around 1556 village councils spread across 20 districts, I have information about the caste of the council head in 2015. In Table 15, I show the summary statistics for these councils. Almost half (50%) of these positions are won by ST candidates, followed by OBC candidates (28%). A small number of these seats are won by open candidates (12%) and by SC candidates (9%).

Table 15: Summary Statistics for caste winners in 2015

	Obs	Count	Mean	Std. dev.	Min.	Max.
SC winners	1,556	145	0.09	.291	0	1
ST winners	1,556	781	0.50	.5	0	1
OBC winners	1,556	440	0.28	.45	0	1
Open winners	1,556	190	0.12	.328	0	1

Village councils

I use four village council level observables to create the indicator variable X: women literacy, women population, women labor force participation, and prevalence of electricity in the council and use a median split to define “high” and “low” values of the observable. Table 16 shows the summary statistics of indicator variables thus created. 480 or 47% of village councils are those with high women literacy, 261 or 26% of village councils have high women population, 364 or 36% of village councils have high female labor force participation, and 512 or 50% of village councils have high electricity proportion.

Table 16: Summary Statistics for village council observables - Unreserved in 2015

	Obs	Obs=1	Mean	Std. dev.	Min.	Max.
High women literacy	1,014	480	0.47	.5	0	1
High women proportion	1,014	261	0.26	.437	0	1
High female labor force participation	1,014	364	0.36	.48	0	1
High electricity proportion	1,014	512	0.50	.5	0	1

Since the median is calculated using all village councils, and these summary statistics are for a subset of unreserved village councils, the percentage of village councils classified as “high” can be different than 50%.

K Comparison of observables - lasting effects

Table 17 compares the village councils in the preferred model (only the unreserved seats in 2015 in non-scheduled areas). Here too, the means for village councils are similar.

Table 17: Comparison of observables for the estimation sample - only the unreserved seats in 2015

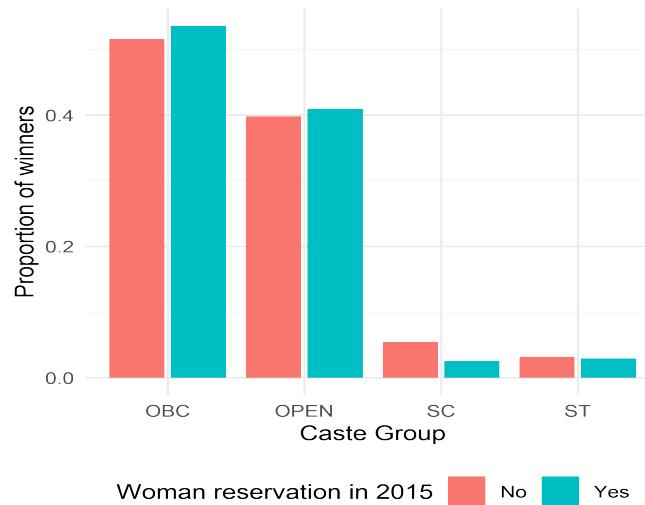
	Control	Treatment	Difference in means	
	Mean	Mean	Diff.	t-stat
Number of households	1,040	1,069	-29	-1.29
Total population	5,841	5,927	-86	-0.69
Proportion of women	.48	.49	-.00036	-0.55
Proportion SC	.18	.19	-.013	-1.67
Proportion ST	.11	.14	-.025*	-2.40
Proportion under age 6	.18	.18	.000021	0.01
Proportion literate - women	.4	.4	-.00047	-0.09
Proportion literate - males	.61	.61	.003	0.62
Women labor force participation	.3	.31	-.005	-0.58
Male labor force participation	.52	.52	.0019	0.63
Main source of drinking water is well	.29	.29	-.00027	-0.01
Main source of drinking water is handpump	.27	.28	-.0018	-0.10
Lighting source - Electricity	.2	.19	.0084	0.41
Lighting source - Kerosene	.43	.43	.0024	0.09
Cooking fuel - firewood	.4	.42	-.021	-0.76
Have radio	.12	.1	.014	1.94
Have bicycle	.39	.34	.045	1.87
N	408	604	1,012	

The control group is composed of village councils that were not reserved for women in 2010. The treatment group is composed of village councils that were reserved for women in 2010. Except total households and total population, all observables are proportions. The F statistic for the regression where the dependent variable is a treatment indicator and all the observables are controls is less than 2, suggesting that these observables, even jointly do not have much strength in predicting treatment.

L Caste distribution on seats not reserved for any caste group

In Figure 10, I show that on seats not reserved for any caste group, the caste distribution of winning candidates on seats reserved for women is similar to those not reserved for women. Regression estimates are shown in Table 4. I study if the the caste of winning candidate is affected if the council seat is subject to gender quota. I estimate 1 with different four dependent variables: An indicator that turns one if the seat was won by candidate belonging specific caste group (SC, ST, OBC and neither) else zero. Due to data limitations, estimate models using data for village council head seats for select districts in 2015. The estimates in row 2 implies that the probability of SC, ST, OBC and OPEN candidate winning an unreserved seat when the seat was *not* reserved for women is 5.1%, 3%, 52% and 40% respectively. These probabilities are unaffected if the seat is reserved for a woman.

Figure 10: Winners by caste groups on seats reserved and not reserved for women



M Inc incumbency

Figure 11 shows the number of incumbent and non-incumbent woman winners in the treatment and control groups. In the treatment group, out of 111 women winning on unreserved seats, 77 are incumbents while 34 are non-incumbents. In the control group out of 15 women winning on unreserved seats, 4 are incumbents and 11 are non-incumbents. Thus, in the treatment group, a higher proportion of woman winners are incumbents as compared to the control group suggesting gender quotas provide women incumbency advantage.

Figure 11: Incumbent and non-incumbent women

