Contemporaneous and Lasting effects of Electoral Gender Quotas

Swapnil Motghare*

October 15, 2022

Abstract

This paper examines several ways in which electoral gender quotas affect the political system. It uses data on reserved seat quotas for women in village councils in the Indian state of Jharkhand. Village council head positions subjected to gender quotas continue to elect more women even after the quotas are no longer binding. Gender quotas do not have spillover effects on other lower hierarchy positions in the council. They reduce electoral competitiveness, but only in the first round of elections and only at council member position. They do not affect the caste composition of the winning candidates. 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 affirmative action policies addressing other forms of discrimination.

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

*University of Notre Dame. smotghare@nd.edu. I would like to thank Lakshmi Iyer, Price Fishback, Jessamyn Schaller, Tiemen Woutersen, Tauhidur Rahman, Stephen D. O'Connell, Carlo Schwarz, Arundhati Tillu, Shariq Mohammed, Daniel Hicks, Justin Esarey, Varun Karekurve-Ramachandra, and seminar participants at Asian Economic Development Conference 2022, Reserve Bank of India, Young Economists Symposium 2019 and Annual Conference of the Missouri Valley Economic Association for comments and feedback. I would also like to thank Awake Khobragade and Sonam Raut for their excellent research assistance.

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, 2013). A common use of quotas is for women in legislatures, known as electoral gender quotas. 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. They are quite commonly used and some form of them is in effect 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 several ways in which gender quotas affect the political system. I study if electoral gender quotas have lasting effects after they are no longer binding, spillover effects on lower hierarchy positions, anti-competitive effects, and externalities on the representation of other demographic groups. These positive and negative effects frequently arise while discussing gender 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

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

[2] As 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).

Indian state of Jharkhand, spanning two consecutive elections held in 2010 and 2015. These data are well suited for the analysis since the seats subject to quotas were quasi-randomly allocated in each election which the identification exploits.

The primary motivation to study the lasting effects of gender quotas is to test an implicit assumption that temporary gender quotas would remove barriers women face in entering politics, eventually negating the need for such quotas. However, if women do not perform well after getting elected, possibly due to lower education, training, experience and "contacts" to get work done, gender quotas can have negative lasting effects. I find positive lasting effects of quotas: Village councils head positions subjected to mandated reserved seat gender 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 women winning probability in the absence of quotas is less than 1 percentage point and resulted in additional 275 women becoming council heads (occupying around 6% of total positions available). There is not much heterogeneity in these effects by caste and geographic region suggesting that women of all caste groups and geographic regions have similar lasting effects.

Interestingly, I find no lasting effects at the council member position. 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. The next election lasting effects contrast with Beaman et al. (2009) who finds lasting effects only after two elections. This could be because of less rigid voter attitudes that are easier to change in the more recent period of time examined in this study.

Gender quotas at high hierarchy positions may have desirable "trickle-down" or spillover effects on women's representation at lower hierarchy positions. 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. Baskaran and Hessami (2018) finds spillover effect of female mayors on women council candidates in German state of Hesse. Evidence also exists for spillover effects of gender quotas at sub-state level helping females enter politics at state and federal levels (Goyal, 2020a,b; Karekurve-Ramachandra, 2020; Maitra and Rosenblum, 2021; O'Connell, 2020).[3] I find no spillover effects of gender quotas at the council

[3]Gould et al. (2018) documents evidence of spillover effect between female board representation and female executive representation. But Bertrand et al. (2018) does not observe such effects while studying board gender

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 and quotas do not seem to have additional effect on further increasing the numbers.

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 and only at council member position. 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 (20%, an increase of 8.7 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 at council head position and in the second round of elections (2015) when a council member seat subject to gender quotas is less likely to be vacant and equally likely to be 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 the 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. Interestingly, previous research has found contrasting effects on effect of gender quotas on winning probability of high caste candidates. Karekurve-Ramachandra and Lee (2020b) finds that seats subject to gender quotas are more likely to elect candidates from the Hindu upper castes. While Cassan and Vandewalle (2021) finds that gender quotas lead to a marked decline in the

quotas in Norway.

likelihood a high caste candidate winning the village council election.[4] 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. The null effect could be either due to no inter-caste differences in the status of women or due to the presence of quotas for all caste groups in the state I focus on. Nevertheless, this exercise highlights the importance of replicating results in different settings.

I explore the mechanisms for the strong lasting effects observed at the council head position. First, there is no evidence that village council observables such as women's 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. Second, I cannot rule out incumbency advantage as a mechanism as the effect disappears when focusing on non-incumbent women. 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%), which suggests that quotas help introduce "new" women in politics. However, the estimate becomes smaller and statistically insignificant in presence of additional controls. Third, with no spillover effect, I also rule out the possibility of more women council heads in 2015 being a result of more women council members in 2010 who can potentially contest for head positions in 2015. Lastly, the increase in women council heads may have come at the cost of a decrease in women council members as there are fewer women council members when the council head was subject to gender quotas in the previous election.

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. Moreover, quotas do not have an additional effect when women are already winning in significant numbers.

The results improve our understanding of electoral gender quotas which are used by a number of countries around the world. They 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

[4]Cassan and Vandewalle (2021) attributes these opposite findings to a difference in study sample. Karekurve-Ramachandra and Lee (2020b) uses data from the 2017 elections for Municipal Corporation of Delhi, while Cassan and Vandewalle (2021) uses 2005–2006 edition of the Rural Economic and Demographic Survey which provides a nationally representative sample of rural households in India.

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, using a sample size that is larger than many other papers in the literature. This paper complements Beaman et al. (2009) and Bhavnani (2009) by studying the lasting effects of gender quotas in a more recent time and a different social context.

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. 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. The results are pertinent for 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 E.

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 D).[5] 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 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 E). 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.[6] 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.[7] 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.[8]. While the number of seats reserved for SCs, STs are to be in proportion to the group's population in a council's jurisdiction,

[5]In 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.

[6]In 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.

[7]The 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.

[8]Statement of Objects and Reasons PR Act

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 G.1 in Appendix G). 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 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 H.1 in Appendix H).

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.[9] 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.

[9]Political 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).

I focus on the first two village council elections in Jharkhand that happened in 2010 and 2015, respectively.[10] There was no system of local governance before 2010.[12] In Appendix C, 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.

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. The SEC does not record the gender of the winning candidate and 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 gender.[13] Data on council head caste and highest qualification for some districts in 2015 comes from 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). Appendix A has more details on what data are available for which districts. 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 database (Indiawater).

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%.[14] Women winning unreserved seats increased from 3 percentage points in 2010 to 9 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, 59% of these were reserved for women, while women won around 64% of them. In 2015, 52% of them were

[10] Jharkhand 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).[11]

[12] The 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.

[13] I 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%.

[14] The 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	787	0.57
Unopposed	166	0.04	166	0.02
Vacant	166	0.03	166	0.06
Reserved for woman	8,683	0.59	16,038	0.52
Woman won	3,679	0.64	12,539	0.57
Unopposed	2,791	0.17	3,473	0.25
Vacant	3,422	0.02	9,448	0.02

(i) The upper half shows data for around 4,400 council head seats. (ii) Data for caste of council head, gender of the deputy council head, proportion of women council members, unopposed and vacant seats is available for a limited number of districts. (iii) The lower half shows data for council member seats.

reserved for women, while women won 57% 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 and 2015 (2%).

4 Empirical Strategy

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

$$Y_s = \beta_0 + \beta_1 reserved\_for\_woman_s + \epsilon_s \tag{1}$$

where Y_s is the outcome of interest on council seat s, $reserved\_for\_woman_s$ 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

$$Y_{s,2015} = \beta_0 + \beta_1 reserved\_for\_woman_{s,2010} + \epsilon_s \tag{2}$$

where $Y_{s,2015}$ is the outcome of interest on council seat s in 2015 election, $reserved\_for\_woman_{s,2010}$ 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 $reserved\_for\_woman$ 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. The process of reserving seats is similar to that in Chattopadhyay and Duflo (2004) and described in Appendix C.

Table 2: Comparison of observables for village councils in 2010

	Not reserved Mean	Reserved Mean	Difference in means 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	

(i) Except total households and total population, all observables are proportions. (ii) t-statistic is for the null hypothesis of equal means. (iii) Data Source: Census of India, 2011

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 I). These observations lends credibility to the assumption of randomized selection of seats reserved

and unreserved for women.[15]

5 Lasting effects

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 ability stereotyping. Since gender stereotypes are something which have a permanent effect, we may see lasting effects of quotas. 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.

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.[16] 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 examine this issue by estimating equation 2 using village council head and member 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

[15] A subtle threat to identification of lasting effects is discussed in Sekhon and Titiunik (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.

[16] Figure A.1 shows that the educational attainment of women winning elections is lower than of men.

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 3: Lasting effects

	Woman win in 2015				
	(1)	(2)	(3)	(4)	(5)
reserved for woman in 2010 (head)	0.136***	0.171***	0.140***	0.135***	0.110***
	(0.011)	(0.014)	(0.014)	(0.015)	(0.023)
Constant	0.033**	0.049*			
	(0.010)	(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
reserved for woman in 2010 (member)	0.015	0.010	0.012	0.012	0.014
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Constant	0.113***	0.121***			
	(0.010)	(0.010)			
District FE			X		
Block FE				X	
Council FE					X
Scheduled areas		X	X	X	X
N	2,692	2,807	2,807	2,807	2,807

(i) Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) The dependent variable is an indicator which equals 1 if seat was won by women in 2015 else zero. (iii) The sample for the upper panel is unreserved council head seats in 2015 while that for the lower panel is unreserved council member seats in 2015. (iv) Controls include demographic, education, labor force and economic status observables shown Table 2. (v) The districts whose village councils are used in estimation are shown in Table A.1.

Table 3 presents the lasting effects of gender quotas at council head (top panel) and member position (bottom panel). The estimates from model 1 in the top panel 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 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.

This 13.6 percentage point increase in women winning probability 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, occupying around 6% of total positions available, because of quotas. In Appendix J, I estimate this effect when the gender quota seat in the previous election was additionally reserved for a caste and find that the increase in women winning probability is similar across castes. The estimate is also unchanged when using different geographical regions. Thus, the results are not driven by women of a particular caste or geographic region. Notably, women of all castes seem to have a similar lasting effect.

I study the persistent effect of quotas at village council member level in the bottom panel of Table 3. 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. The estimates do not change much after adding councils from scheduled areas in model 2. The rest of the models use district, block and council fixed effects such that the seats within the same district, 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%). The null results for members 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. The next election lasting effects contrast with Beaman et al. (2009) who finds lasting effects at council head and member positions in the neighboring state of West Bengal but only after two elections. This is attributed to changing voter attitudes among voters exposed to women council heads. Since I use data from a more recent period of time, it is likely that voter attitudes are less rigid now and hence change faster. Additionally, it may have become easier for women to win elections now with the rise in women's voting in India (Rai, 2011).

6 Contemporaneous effects

6.1 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.[17]

The results for deputy council head are shown in columns 1 through 4 in Table 4.[18] The estimates from model 1 indicate that in 2010, women are 43.4% likely to win the deputy council position if 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 4. The estimates from model 5 indicate that in 2010, the proportion of women council

[17]Council 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.

[18]Since districts are not required to report this information, these results are only available for a few districts that voluntarily reported data on deputy council head.

Table 4: 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	-0.087	0.021	0.008	-0.001	-0.001	0.006	0.006
	(0.058)	(0.063)	(0.051)	(0.053)	(0.017)	(0.017)	(0.006)	(0.006)
Constant	0.434***		0.402***		0.622***		0.568***	
	(0.042)		(0.037)		(0.013)		(0.005)	
N	289	263	380	375	154	153	787	710
R sq.	0.002	0.117	0.000	0.134	0.000	0.207	0.001	0.244
Controls	No	Yes	No	Yes	No	Yes	No	Yes
Number of districts	2	2	2	2	1	1	5	5

(i) Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) 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. (iii) The sample is council head seats in 2010 and 2015. (iv) Controls include demographic, education, labor force and economic status observables shown Table 2. (v) The districts whose village councils are used in estimation are shown in Table A.1.

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 close to 60%.

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 >57% at council member positions). So, there is no marginal effect of gender quotas in increasing these numbers further.

6.2 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.[19]

The results for vacant seats are shown in columns 1 through 4 in Table 5 at council head (top panel) and member position (bottom panel).[20] In the top panel, the estimates from model 1 indicate that a council head seat is 1.3% likely to be vacant if it is *not* subject to gender quota. This probability increases by 3.3 percentage points (=4.6%) if the seat is subject to gender quota. Both these estimates are statistically insignificant and they remain so after controlling for block fixed effects (model 2), and using data for 2015 (model 4 and 5). In the bottom panel, the estimates from model 1 indicate that a council member 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. Model 2 uses council fixed effects such that the seats within the same council, which are more likely to be similar, are compared. The increase in vacancy probability is now 1.4 percentage points. Model 3 and 4 use data for 2015. Estimates from model 3 suggest that in 2015, a seat is 0.8% likely to be unfilled. This probability decreases by 0.6% (=0.2%)if the seat is subject to gender quota. The results are similar in model 4 that uses council fixed effects. Thus, there is no effect of gender quotas on vacancy at council head position while at the council member position, quotas increase the probability in 2010 and decrease in 2015.

Table 5: Electoral competitiveness

	Vacant				Won unopposed			
	(1) 2010	(2) 2010	(3) 2015	(4) 2015	(5) 2010	(6) 2010	(7) 2015	(8) 2015
reserved for woman (head)	0.033	0.028	0.045	0.065	0.021	0.026	-0.001	-0.004
	(0.027)	(0.031)	(0.037)	(0.037)	(0.029)	(0.026)	(0.024)	(0.026)
Constant	0.013		0.037		0.025		0.025	
	(0.019)		(0.026)		(0.021)		(0.017)	
N	166	151	166	151	166	151	166	151
Block FE + Controls	No	Yes	No	Yes	No	Yes	No	Yes
reserved for woman (member)	0.013**	0.014**	-0.006***	-0.006***	0.087***	0.084***	0.028	0.024
	(0.005)	(0.004)	(0.001)	(0.001)	(0.014)	(0.014)	(0.015)	(0.014)
Constant	0.012**		0.008***		0.113***		0.239***	
	(0.004)		(0.001)		(0.011)		(0.011)	
N	3,420	3,418	9,025	9,023	2,791	2,789	3,471	3,471
Council FE	No	Yes	No	Yes	No	Yes	No	Yes
Number of districts	2	2	4	4	2	2	2	2

(i) Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) 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. (iii) The sample for the upper panel is council head seats in 2010 and 2015 while that for the lower panel is council member seats in 2010 and 2015. (iv) Controls include demographic, education, labor force and economic status observables shown Table 2. (v) The districts whose village councils are used in estimation are shown in Table A.1.

Results for unopposed seats are shown in columns 5 through 8 in Table 5 at council head (top

[19]I use these measures over the typical measures of the winning margin and the effective number of candidates because I do not have data on the number of candidates or votes received by them.

[20]Since districts are not required to report this information, these results are only available for a few districts that voluntarily reported data on vacancy and seats won unopposed.

panel) and member position (bottom panel). In the top panel, the estimates from model 1 indicate that a council head seat is 2.5% likely to be unopposed if it is *not* subject to gender quota. This probability increases by 2.1 percentage points (=4.6%) if the seat is subject to gender quota. Both these estimates are statistically insignificant and they remain so after controlling for block fixed effects (model 6), and using data for 2015 (model 7 and 8). In the bottom panel, the estimates from model 5 indicate that a council member seat is 11.3% likely to be unopposed if it is *not* subject to gender quota. This probability increases by 8.7 percentage points (=20%) 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 8.4 percentage points. Models 7 and 8 use data for 2015. Estimates from model 7 suggest that in 2015, a seat is 23.9% likely to be unopposed if it is *not* subject to gender quota. This probability does not change if the seat is subject to gender quota. The results are similar in model 8 that uses council fixed effects. Thus, there is no effect of gender quotas on seat being won unopposed at council head position while at the council member position, quotas increase the probability in 2010 but not in 2015.

These results show that gender quotas decrease electoral competitiveness as measured by the increase in the probability of a 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 and only at the council member position. In the second round, seats subject to gender quotas are less likely to be vacant and equally likely to be won unopposed. Likely, the 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 the unavailability of candidates. A favorable policy environment can be used to incentivize women to contest elections.

6.3 Effect on the caste structure

Gender quotas may affect 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 6: 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 (head)	-0.029*	-0.023	-0.002	-0.001	0.020	0.011	0.012	0.013
	(0.012)	(0.013)	(0.017)	(0.013)	(0.017)	(0.021)	(0.022)	(0.021)
Constant	0.055**		0.032*		0.516***		0.397***	
	(0.013)		(0.013)		(0.065)		(0.068)	
N	456	406	456	406	456	406	456	406
Block FE + Controls	No	Yes	No	Yes	No	Yes	No	Yes
reserved for woman (member)	0.013	0.011	0.015	0.004	0.017	0.018	-0.038	-0.027
	(0.015)	(0.014)	(0.009)	(0.018)	(0.021)	(0.030)	(0.025)	(0.029)
Constant	0.065		0.042		0.433*		0.399*	
	(0.028)		(0.023)		(0.077)		(0.114)	
N	820	816	820	816	820	816	820	816
Council FE	No	Yes	No	Yes	No	Yes	No	Yes

(i) Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) In model 1, the dependent variable is an indicator which equals 1 if SC candidate won in 2015, else 0. (iii) The sample for the upper panel is council head seats in 2015 while that for the lower panel is council member seats in 2015. (iv) SC = Scheduled Caste, ST = Scheduled Tribe, OBC = Other Backward Castes, OPEN = Everything else. (v) Controls include demographic, education, labor force and economic status observables as shown in Table 2. (vi) The districts whose village councils are used in estimation are shown in Table A.1.

Table 6 shows the effect of gender quotas on caste composition at council head (top panel) and member position (bottom panel). In the top panel, estimates from model 1 indicate that a council head seat is 5.5% likely to be won by SC candidate if it is *not* subject to gender quota. This probability decreases by 2.9 percentage points (=2.6%) 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. In the bottom panel, estimates from model 1 indicate that a council member seat is 6.5% likely to be won by SC candidate if it is *not* subject to gender quota. This probability unaffected if the seat is subject to gender quota. Controlling for village council fixed effects in model 2, 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 Karekurve-Ramachandra and Lee (2020b), 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. Another explanation could be that caste groups do not differ in terms of status of women in the state I focus on. Nevertheless, this exercise highlights the importance of replicating results in different settings.

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

$$\begin{aligned} woman\_win\_2015_{s,2015} = \beta_0 + \beta_1 * X_{2010} + \beta_2 * reserved\_for\_woman\_2010_{s,2010} + \\ \beta_3 * reserved\_for\_woman\_2010_{s,2010} * X_{2010} + \epsilon_s \end{aligned} \tag{3}$$

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 7 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 7: 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**	0.047*	0.033*	0.030*	0.050**
	(0.010)	(0.017)	(0.011)	(0.011)	(0.015)
X		-0.022	0.014	0.019	-0.025
		(0.023)	(0.024)	(0.021)	(0.015)
reserved for woman in 2010	0.136***	0.141***	0.118***	0.119***	0.101***
	(0.011)	(0.024)	(0.020)	(0.023)	(0.017)
reserved for woman in 2010 x X		-0.031	0.036	0.022	0.052
		(0.052)	(0.029)	(0.038)	(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

(i) Standard errors (clustered by district) in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) The dependent variable is an indicator which equals 1 if seat was won by women in 2015 else zero. (iii) 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.[21] 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 prevalance of repeat winners, Table 8 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 women incumbency. If anything, it reduces women incumbency. Comparing rows 5 and 6, suggests that seats reserved in both rounds have higher women incumbency 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 strong candidates that win election again. Interestingly, the seats twice reserved do not have a higher incumbency rate than raw incumbency rates (Row 2). 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%. 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.

[21] In 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).

Table 8: 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

(i) incumbency rate = 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. Table 9 shows estimates of equation 2 but with the dependent variable as $non\_incumbent\_woman\_2015_{s,2015}$, 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. However, the estimate is insignificant. 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 where one would expect strong stereotypes, and such effects have been found in the literature.[22]

[22]Beaman 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.

Table 9: Lasting effects - non-incumbent women

	Non-incumbent woman win in 2015				
	(1)	(2)	(3)	(4)	(5)
reserved for woman in 2010	0.027	0.041**	0.027*	0.023	0.015
	(0.014)	(0.011)	(0.013)	(0.013)	(0.016)
Constant	0.025*	0.033*			
	(0.009)	(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
R sq.	0.005	0.005	0.046	0.159	0.175

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

7.3 Upward mobility of women council members

With the no spillover effect, I can rule out another mechanism for lasting effects at the council head position - the upward mobility of 2010 council members. If gender quotas in 2010 at council head positions induce more women to become council members, and these women have upward mobility aspirations, this can increase the pool of candidates for council head positions in 2015, making it more likely that women win in 2015. Since I do not observe a higher number of women council members in 2010 when the council head is subject to gender quotas, I rule out this increased supply and upward mobility mechanism.

7.4 Substituting from council members to council head positions

One mechanism that can explain the increased number of women becoming council heads in 2015 could relate to women becoming council heads instead of council members. To study this mechanism, Table 10 shows the effects of gender quotas at council head positions on the proportion of women council members in the next election - lasting spillover effects. The estimates from model 1 indicate that this proportion of women council members in 2015 is 58.2% when the council head position was not reserved for a woman in 2010. Interestingly, this proportion is lower by 2.2% (=56%) when the council head position was reserved for a woman in 2010. Model 2 controls for block fixed effects and village council observables and finds a larger effect of gender quotas that is significant at 95% confidence level. This result, along with lasting effects at the council head position, suggests that some women who in 2015 may have contested for council member positions, likely shifted to contesting council head positions instead, after being exposed to gender quotas at council head in 2010. Thus, the increase in women council heads may have come at the cost of a decrease in women council members. These increased aspirations of women are consistent with the results of

Beaman et al. (2012) who find that exposure to women leadership influences adolescent girls' career aspirations.

Table 10: Lasting spillover effects

	Proportion of women council members in 2015	
	(1)	(2)
council head reserved for woman in 2010	-0.022*	-0.032**
	(0.009)	(0.010)
Constant	0.582***	
	(0.007)	
N	374	334
R sq.	0.016	0.305
Block FE + Controls	No	Yes

(i) Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) The dependent variable is a ratio of number of women council members to total council members. (iii) The sample is unreserved council head seats in 2015. (iv) Controls include demographic, education, labor force and economic status observables shown Table 2. (v) The districts whose village councils are used in estimation are shown in Table A.1.

7.5 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

This paper examines several ways in which gender quotas affect the political system, using newly compiled data on reserved seat quotas for women in village councils in the Indian state of Jharkhand. Women are five times more likely to win council head position if it was subject to gender quotas in the previous election. Some of this increase is likely due to women shifting to becoming council heads instead of council members after being exposed to gender quotas. There is also suggestive evidence that incumbency advantage gained through gender quotas might play a role. Gender quotas do not have spillover downstream effects on other lower hierarchy positions in the council. Gender quotas reduce electoral competitiveness, but only in the first round of elections and only at council member positions. Nor do they affect the caste composition of the winning candidates. Overall, positive effects of gender quotas are observed without large negative effects.

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A Data availability

Table A.1 shows the data availability by districts used in models relating to four main findings of the paper. For spillover effects, anti-competitive effects and caste effects, data are only available for some districts. This is because it is difficult to extract data from scanned documents into a machine-readable format or the data is not required to be reported. So, I have focused on districts that provided more easily manageable scanned documents or voluntarily reported data.

Table A.1: Data availability matrix

	Lasting	Spillover				Anti-competitive				Caste	
		DeputyHead		PropMembers		Vacant		Unopposed			
District	2015	2010	2015	2010	2015	2010	2015	2010	2015	2010	2015
Council head											
bokaro	116				245						84
chatra	73			154	154						54
deoghar	90		193		194						99
giridih	172										31
godda	95										78
hazaribagh	118										29
koderma	51										10
ramgarh	60										21
dhanbad	121	223									
lohardaga	31	66									
garhwa	90		187								
dumka	98										
east singhbhum	112										
gumla	77										
jamtara	57										
khunti	42										
latehar	54										
pakur	64										
palamu	137										
ranchi	143				28						
sahibganj	78				166	166	166	166	166		
seraikela kharsawan	65										
simdega	45										
west singhbhum	104										
Council member											
bokaro							2957				463
chatra	712					1522	1986				41
deoghar	919					1897	2016	1500	1402		175
sahibganj							2066		2069		137
dhanbad	1061										
ranchi	115						420				
giridih								1290			

The table shows the number of observations by district used in the analysis. There are a total of 24 districts.

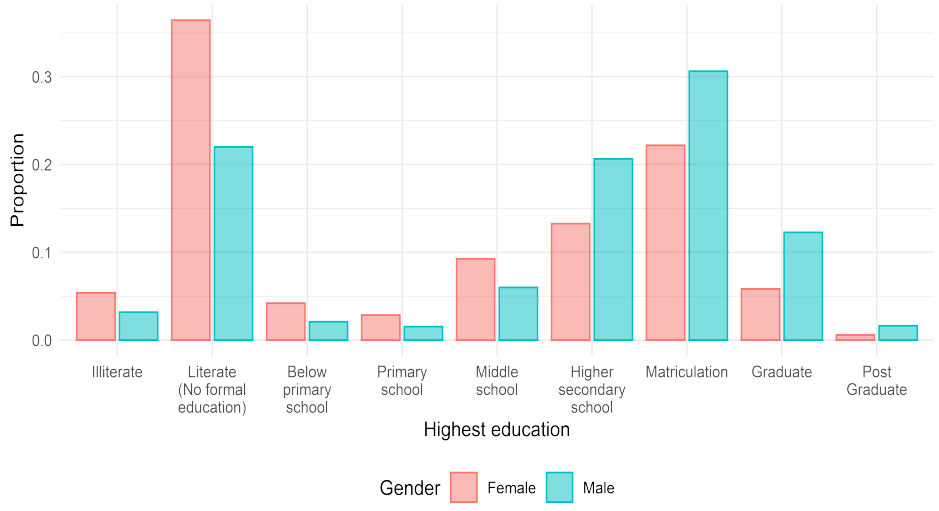
Table A.2 shows that the main results are similar when focusing on four districts which is the smallest subset containing all the outcomes. Some estimates lose significance with this smaller sample. But those that are significant are consistent with results using the larger unbalanced sample.

Table A.2: Main results for the smallest subset containing all outcomes

	Lasting	Competition - Vacant		Competition - Unopposed		SC win	ST win	OBC win	OPEN win	Spillover-DeputyHead		Spillover-PropMembers	
	(1) 2015	(2) 2010	(3) 2015	(4) 2010	(5) 2015	(6) 2015	(7) 2015	(8) 2015	(9) 2015	(10) 2010	(11) 2015	(12) 2010	(13) 2015
reserved for woman (head)	0.17***	0.03	0.05	0.02	-0.00	-0.05	-0.00	-0.05	-0.05	-0.02	0.04	-0.00	-0.01
	(0.04)	(0.03)	(0.04)	(0.03)	(0.02)	(0.03)	(0.02)	(0.03)	(0.03)	(0.07)	(0.07)	(0.02)	(0.02)
Constant	0.09**	0.01	0.04	0.03	0.02	0.07**	0.01	0.07**	0.07**	0.45***	0.42***	0.62***	0.63***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.05)	(0.05)	(0.01)	(0.01)
N	362	166	166	166	166	153	153	153	153	223	193	154	154
R sq.	0.043	0.009	0.009	0.003	0.000	0.012	0.000	0.012	0.012	0.001	0.001	0.000	0.001
reserved for woman (member)	0.01	0.01**	-0.00	0.10***	0.03	0.02	0.00	0.05	-0.06				
	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)	(0.02)	(0.03)	(0.05)	(0.05)				
Constant	0.11***	0.01**	0.00**	0.11***	0.24***	0.02	0.06**	0.38***	0.49***				
	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)	(0.01)	(0.02)	(0.04)	(0.04)				
N	2,692	3,419	6,068	1,500	3,471	356	356	356	356				
R sq.	0.000	0.002	0.000	0.015	0.001	0.004	0.000	0.002	0.004				

(i) Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. (ii) The sample for the upper panel is council head seats while that for the lower panel is council member seats from four districts.

Figure A.1: Educational attainment of women and men winning village council elections in 2015.



B Summary of findings

Table B.1: Summary of findings

What has been found in the literature?	What this paper finds and relation to the literature
• Beaman et al. (2009) finds lasting effects only after two rounds of elections • Bhavnani (2009) finds lasting effects at council member position.	**Positive lasting effects** • Lasting effects are observed in the next election. • Lasting effects are not observed for council member seats.
• No papers study spillover effects in village councils. • Positive spillover effects in politics (Baskaran and Hessami, 2018; Campbell and Wolbrecht, 2006).	**No spillover effects** • Gender quotas at council head positions do not affect the proportion of women council members or the likelihood of women deputy council head.
• No papers that study the likelihood of a seat remaining vacant or contested by a single candidate. • Auerbach and Ziegfeld (2020) find that gender quotas reduce the effective number of candidates, increase vote shares for independent candidates, and decrease vote shares for major parties.	**Positive anti-competitive effects** in the first round of elections and only at council member position. • Gender quotas increase the likelihood of seats remaining vacant or contested by a single (women) candidate in the first round of elections and only at the council member position.
• Cassan and Vandewalle (2021) find that gender quotas lead to a decline in the likelihood of winning for high-caste candidates. • Karekurve-Ramachandra and Lee (2020b) show that seats subject to gender quotas are more likely to elect candidates from the Hindu upper castes.	**No externalities on representation of caste groups** • Gender quotas do not affect the likelihood of winning for high-caste candidates.

C Randomization

C.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

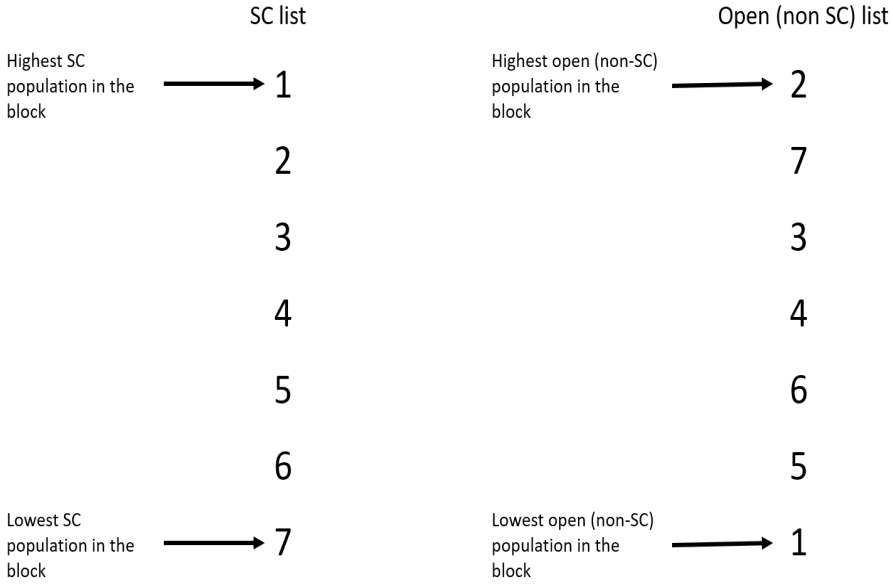
Say there are 7 village councils in a non-scheduled block. For simplicity, I will assume that there is only one caste group for which seats are to be reserved: Scheduled Castes (SC).[23] Also, say the SC constitute 3/7 of the population in the block, which implies 3 village council seats are to be reserved 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 C.1.

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

[23]This can happen if the block has a negligible population of STs and OBCs

Figure C.1: Ranked lists



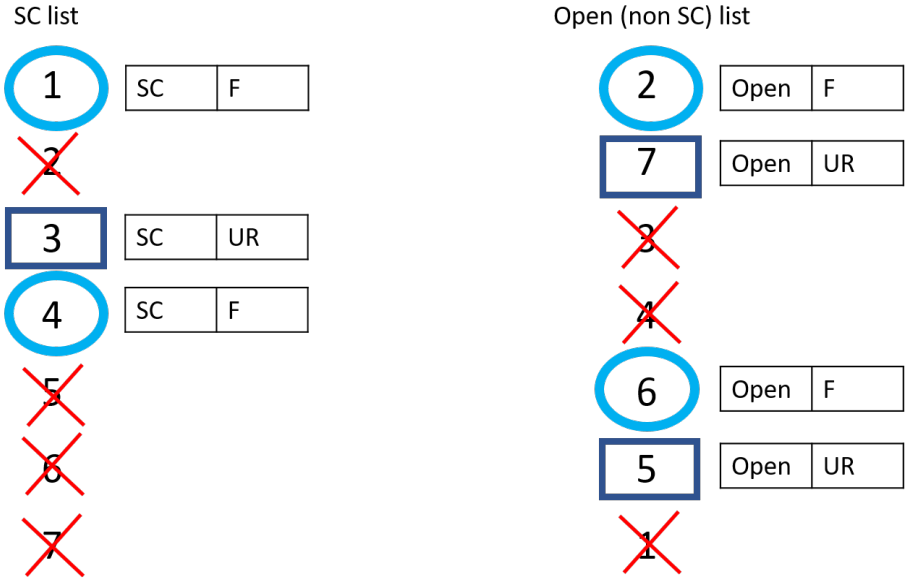
woman or kept unreserved in iterations such that (i) in each iteration, one seat is reserved for SC and kept open respectively and (ii) in odd iterations seats are allotted to women of the respective group. This is how the allocation would work in our example (VC = village council)

- Iteration 1: VC1 from the SC list is reserved for an SC woman (SC-F) in Figure C.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 C.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 C.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 C.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).[24] 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).

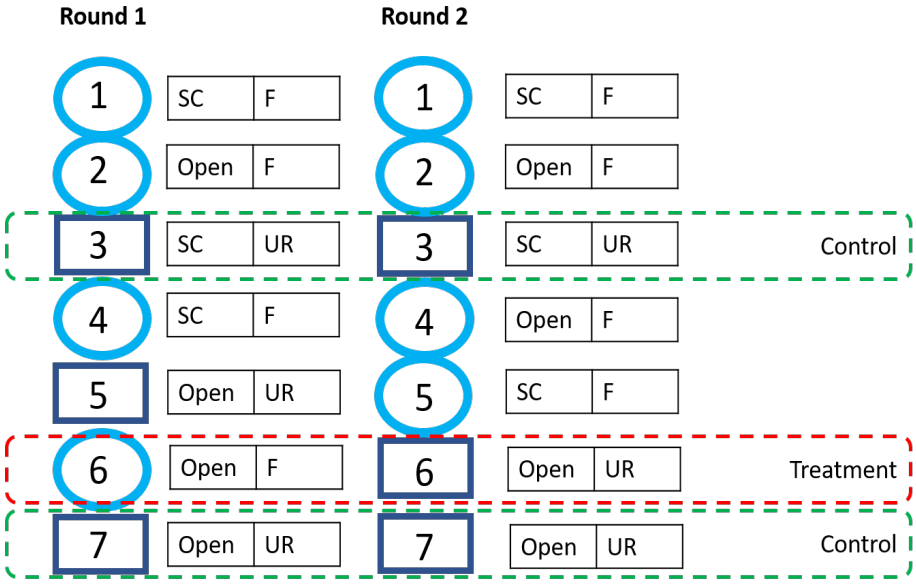
The reserved seats can be higher than the mandate of 50%. If there are odd number of seats reserved for a caste group, ensuring that seats reserved for women of that caste group is at least 50% may lead to a higher proportion of seats reserved for women.

[24]Only one-third of seats are reserved for women

C.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 C.3: Defining treatment and control groups



The figure shows the treatment and control groups in the numerical example. Village council 6 make up the treatment group, while 3 and 7 make up the control group.

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

Figure C.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.

C.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.

D 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.

E 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.[25] 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.[26] 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 panchyats 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 E.1 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.[27]

[25] Much of the content here comes from `http://pesadarpan.gov.in/en_US/legislations`

[26] most likely depending on changing population of tribals in these areas

[27] These are the cases when there are odd numbered village councils in a block and to ensure that seats reserved for woman do not fall below 50%, in the second round one odd numbered seat is reserved for female in addition to

Table E.1: 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

all even numbered seats. This leads to some odd numbered seats getting twice reserved.

F 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 provison of Other Backward Caste (OBC) reservation.[28] 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.

[28] Kumar (2001)

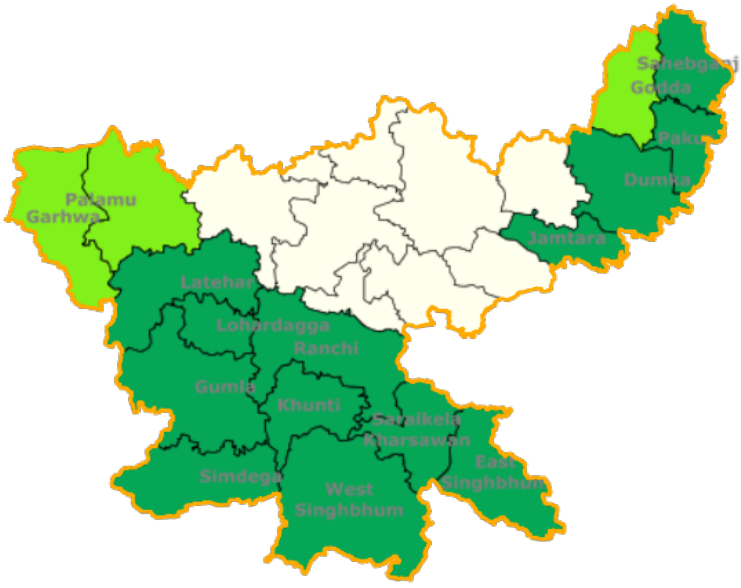
G Location of Jharkhand state

Figure G.1: 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.)

H Scheduled areas in Jharkhand

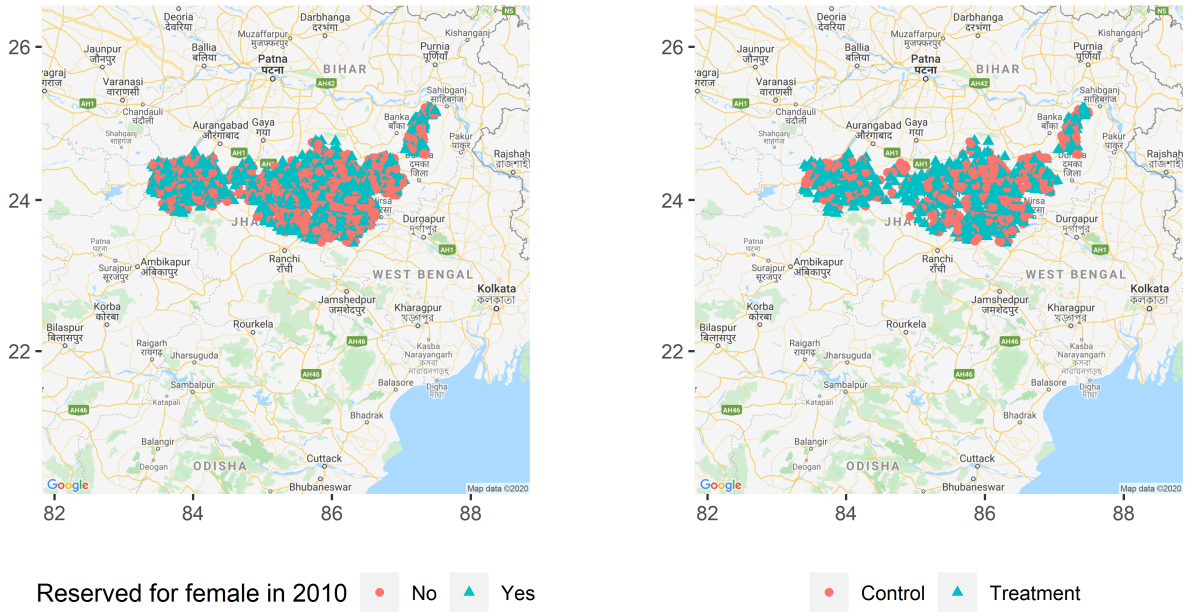
Figure H.1: Scheduled areas in Jharkhand



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)

I Spatial distribution of village councils

Figure I.2: 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)

J Heterogeneity

J.1 Caste heterogeneity of effect

A seat reserved for women may also be reserved for a caste group. I now explore how caste and gender reservations affect the lasting effects. If caste identities are strong, we can expect the lasting effect to differ by caste groups. In equation 2 I interact $reserved\_for\_woman_s$ with indicator variables that turn 1 if the seat is reserved for caste group and estimate the model using Open as the omitted category. Estimates presented in Table J.1 indicate little caste heterogeneity in lasting effects of quotas. Estimates from model 1 indicate that the probability of women winning an unreserved seat in 2015 when the seat was *not* reserved for any caste group (or was "open") is 2.9%. This probability does not vary if the seat was reserved for any particular caste group. The probability of a woman winning an unreserved seat in 2015 increases by 12.2 percentage points if the seat was reserved for a woman but not for any caste in 2010. This increase in probability is similar if the seat was additionally reserved for caste groups in 2010. If the seat was reserved for OBC women, the increase is smaller. Thus, the lasting effects do not vary by caste of the women.

Table J.1: Caste Heterogeneity of lasting effects - Council head position

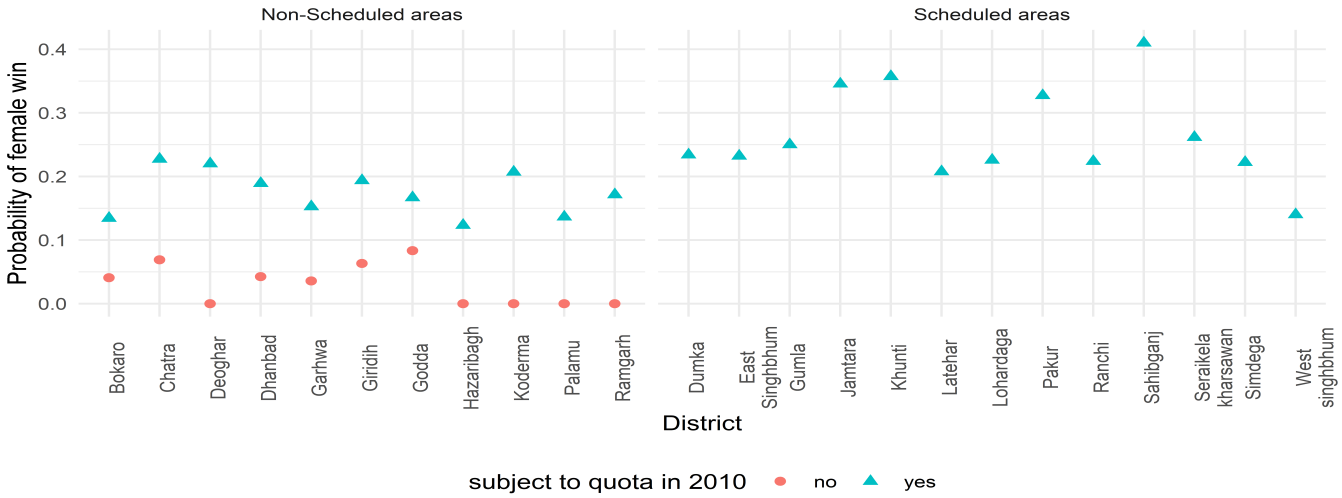
	Woman win in 2015				
	(1)	(2)	(3)	(4)	(5)
reserved for woman in 2010	0.122***	0.122***	0.122***	0.117***	0.117***
	(0.022)	(0.021)	(0.021)	(0.024)	(0.024)
reserved for woman x SC in 2010	0.015	0.018	0.018	0.024	0.024
	(0.036)	(0.038)	(0.038)	(0.047)	(0.047)
reserved for woman x ST in 2010	0.135	0.036	0.036	0.081	0.081
	(0.071)	(0.070)	(0.070)	(0.053)	(0.053)
reserved for woman x OBC in 2010	-0.053*	-0.045	-0.045	-0.048*	-0.048*
	(0.023)	(0.022)	(0.022)	(0.018)	(0.018)
reserved for SC in 2010	0.014	0.017	0.017	0.017	0.017
	(0.025)	(0.028)	(0.028)	(0.038)	(0.038)
reserved for ST in 2010	0.036	0.132	0.132	0.100	0.100
	(0.065)	(0.075)	(0.075)	(0.070)	(0.070)
reserved for OBC in 2010	0.001	-0.005	-0.005	-0.004	-0.004
	(0.015)	(0.014)	(0.014)	(0.018)	(0.018)
Constant	0.029*				
	(0.009)				
District FE		X	X		
Block FE				X	X
Controls					X
Scheduled areas		X	X	X	X
N	1,102	2,092	2,092	2,092	2,092
R sq.	0.070	0.081	0.081	0.198	0.198

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

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.

J.2 Regional heterogeneity of effect

Figure J.1: 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 J.1.[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 sugegsting that the effects are not driven by some districts. For five districts (Deoghar, Hazaribaghm, 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 J.2 in Appendix J.2. The coefficients on the interaction terms indicate the differential effects of woman quotas by district.

Table J.2: 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. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

K Incumbency

Figure K.1 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 K.1: Incumbent and non-incumbent women