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ORIGINAL ARTICLE

Effect of Political Quotas on Attributes of Political Candidates and Provision of Public Goods

Chitra Jogani[1]

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Abstract

This paper provides a comprehensive analysis of the effect of an affirmative action policy on the quality of candidates using political quotas in India. Using the latest data and a regression discontinuity design, I find the caste quotas lead to political candidates with different attributes: lower wealth, lower criminal charges, and increased representation of women, but similar education levels. I find no significant difference in the level of public goods in rural India between quota-bound and non-quota-bound areas. The results suggest an increase in political diversity with no negative effects on the provision of basic facilities.

Keywords Political quota · Affirmative action · India · Regression discontinuity

JEL Classification J15 · J78 · D72

Introduction

Under-representation on the basis of identity exists in many sectors across the world, including education, employment, and politics. To address the under-representation, policymakers often turn to affirmative action policies. But, affirmative action policies are controversial because of the fear that they may lead to candidates or employees of lower qualifications or ability. This controversy has been investigated more widely for affirmative action policies in education and employment opportunities (Bagde et al. 2016; Holzer and Neumark 1999; Francis-Tan and Tannuri-Pianto

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2018).[1] In this paper, I investigate this controversy for a popular form of affirmative action policy in politics – political quotas.

To assess the effect of quotas, I use political quotas in state elections, which have been in place for the past seven decades in the largest democracy, India. Various studies have focused on quotas in the local village council where the assignment of quotas is randomized, unlike the quotas in the state legislature (Chattopadhyay and Duflo 2004a, b; Bardhan et al. 2010; Dunning and Nilekani 2013). The quota in state elections exists for the historically disadvantaged groups, the Scheduled Castes and Scheduled Tribes, who comprise a quarter of India's population. The quotas are implemented by "reserving" approximately a quarter of the total 4,120 electoral districts in India.[2] Reservation of an electoral district for Scheduled Castes (Tribes) stipulates only citizens belonging to the Scheduled Castes (Tribes) can stand for elections (for district's representative in the state legislative assembly) in the district.

Estimating the causal effect of quotas can be challenging as the assignment of quotas is not random, leading to endogeneity issues, such as quotas being correlated with economically poor electoral districts. But, the assignment of reservation status to constituencies by the Delimitation Commission in India provides a suitable empirical setting for tackling the endogeneity problem. The reservation status of an electoral district (or constituency) depends on the population share of the reserved groups. Although there is no explicit population cutoff, I exploit the procedure of reservation after the latest delimitation in a novel way to establish a discontinuous relationship between the share of the reserved population and the reservation status of constituencies.

To understand if caste-quotas affect the qualifications and ability of a candidate, I study the following questions. First, I examine if quotas affect representation of candidates based on other desirable qualifications, such as honesty or competence. As a measure for desirable attributes, I use information on criminal charges, education level, and wealth of all candidates for state elections post the redistricting in 2008. Second, I study if there is a difference in the delivery of village facilities, such as schools, hospitals, and roads, between quota-bound and non-quota-bound areas. Finally, I use the gender of candidates to investigate if caste-quotas displace the other underrepresented group in politics - women.

The primary findings on how quotas affect the attributes of candidates: Candidates standing for election from Scheduled Caste constituencies are less likely to have a criminal charge (4.4 percentage points); have lower assets (0.14 million USD or 76 percent lower); and have similar education levels to candidates in constituencies not reserved for the Scheduled Castes. Comparing the estimates with statistics on attributes for the overall population, the results suggest that the differences observed in the attributes of political candidates do not merely reflect the differences

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[1] Affirmative action policies are also controversial because, by stipulating that minorities must be represented, members of other groups have fewer opportunities to gain admission to prestigious higher education institutions or to assume leadership positions within organizations, for example.

[2] In India, members of the central government are selected in national elections; the representatives of the state legislature are elected through state elections; and representatives at the lower level of government are elected through local elections.

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in attributes of the populations of reserved and unreserved castes. Second, in Scheduled Caste constituencies, more women seek election (5 percentage points more than in non Scheduled Caste constituencies), and more women win (8 percentage points). The effects are larger for candidates affiliated with political parties compared to candidates who contest independently (35 percent of candidates are independents).

Based on the data on facilities in all villages in 2011 and using regression discontinuity, the results do not indicate a significant difference caused by reservation status in the availability of facilities, such as schools, hospitals, roads, and banks across constituencies. The size of the estimates implies any effect greater than a decrease in the availability of facilities in 4 percent of villages in a reserved constituency can be ruled out. Thus, the reserved constituencies are on par with similar constituencies that are unreserved.

This paper relates to several literature. First, this paper contributes to the literature on the effect of affirmative action policies on the quality of candidates. Most studies in the affirmative action literature have focused on the effect of policies in college admissions and employment opportunities (Holzer and Neumark 1999; Bagde et al. 2016; Francis-Tan and Tannuri-Pianto 2018), whereas this paper studies a policy for political candidates who are in a crucial position of managing a state. Although the attributes that define a "good" politician are not clear, to the extent that having criminal charges can be considered a bad attribute and the level of education a good attribute, the reserved constituencies are better off in this respect.[3]

Second, a concern in the affirmative action literature is that affirmative action policies targeting one minority group may displace people from other underrepresented groups (Bertrand et al. 2010). Additionally, the importance of studying the effect of quotas on more than one dimension of identity has received recent attention (Cassan and Vandewalle 2017; Munshi 2019). This question has been studied for gender quotas in local elections in India: Cassan and Vandewalle (2017) show that gender quotas for women in local village councils increase representation of women from lower caste, whereas, Karekurve-Ramachandra and Lee (2020) find the opposite evidence for local bodies in Delhi, India. This paper adds to the above literature by providing causal evidence that caste-quotas in the state legislature lead to more representation of women.

Finally, this paper adds to the few studies on the effect of political quotas in state legislatures on provision of public goods (Jensenius 2015; Min and Uppal 2012). The effect of quotas can change over time, but the null effect obtained in this paper aligns with the findings in Jensenius (2015). Jensenius (2015) uses propensity score method to find no impact of reservation for Scheduled Castes on several

[3] Existing evidence imply that election of criminal politicians affects development negatively (Prakash et al. 2019; Chemin 2012), they under utilize development funds and who have lower attendance rates in meetings (Gehring et al. 2015). Educated leaders can contribute to higher growth (Besley et al. 2011) but may not affect education outcomes (Lahoti and Sahoo 2020). Other papers have pointed out that the effectiveness of a leader may also depend on his other attributes, such as honesty, integrity, and ability (Besley 2005; Besley et al. 2005). Furthermore, one of the aim of affirmative action policies has been to increase diversity in the sector of implementation (Epple et al. 2008), which seems to have been achieved to some extent here.

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development indicators during the period of 1971–2001, when there was a freeze in redistricting. The latest redistricting, which occurred after three decades, corrected for malapportionment within a state. This paper uses new electoral districts and regression discontinuity design to analyze a broader set of village facilities. To the best of my knowledge, this is the first paper using data on new electoral districts and the above identification strategy. It also establishes the null result on reservation for Scheduled Tribes as well, as the literature has found different effects of quotas for Scheduled Castes and Scheduled Tribes.[4]

Institutional Background

Quotas and Elections in India

Quotas are a form of mandated political representation for underrepresented populations.[5] Political quotas in the state elections in India exist for the Scheduled Castes and Scheduled Tribes, which comprise a quarter of the population (16.6 percent and 8.6 percent, Census of India 2011). Such castes and tribes have been historically disadvantaged, with people, sweepers and cobblers, for instance, treated as lower caste or untouchables. The lower castes have faced discrimination and exploitation by the upper castes for generations (Galanter 1984). By contrast, tribal communities traditionally resided in forest areas, which led to their geographical and cultural isolation. Having a history of oppression, members of such castes and tribes have been excluded from the social and political culture (Thorat 2009). Therefore, as a measure of positive discrimination, the constitution implemented political quotas for the Scheduled Castes and Tribes after the independence of India (1947).[6]

Quotas in the state legislative assembly, which exists in the form of reserving electoral districts for the Scheduled Castes and Tribes, guarantee seats for them in the state legislative assembly. The members of the state legislative assembly (known as MLA) are elected in state elections, which occur every five years. The state elections use a "first-past-the-post" system; several candidates run for office in an electoral district, and the candidate with the highest number of votes is the winner or the MLA. There are a total of 4120 electoral districts or assembly constituencies; thus elections from the 4120 districts lead to 4120 MLAs. Reservation of

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[4] For example, Chin and Prakash (2011) find no impact on poverty when the number of assembly constituencies reserved for Scheduled Castes in a state increases, but do find a decrease in poverty on increasing the share of seats reserved for Scheduled Tribe. Whereas, Krishnan (2007) finds leaders from Scheduled Castes improve primary schooling facilities, but finds no significant effect for leaders from the Scheduled Tribes. Pande (2003) finds a positive effect of reservation for Scheduled Tribes on welfare spending, and a positive effect of reservation for Scheduled Castes on job quotas.

[5] There can be various kinds of quotas based on their nature of restriction (candidate list vis-a-vis reserved seats). See (Bird 2014; Htun 2004; UNDP 2012) for details and case studies on political quotas.

[6] Quotas for the Scheduled Castes and Tribes also exist in the local and national government. In state and national elections, electoral districts are reserved, whereas for local elections it is implemented as reservation of seats in the local council. There also exists quota for women in the local elections, but the proposal of quotas for women in state and national government is still under discussion.

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an electoral district for Scheduled castes (or Tribes) mandates that only candidates belonging to the Scheduled Castes (or Tribes) are allowed to run for office from that district. However, voting within reserved districts takes place in the same way voting takes place in all districts; that is, voting is open to everyone, not just to those from reserved groups. Approximately a quarter of the 4,120 districts are reserved; hence reservation means that a quarter of the MLAs in India are represented by members of Scheduled Castes and Tribes.

Seats in the state legislative assembly increase the representation of Scheduled Castes and Tribes in an influential position. The state legislature has significant power over law making, and many matters related to issues, such as agriculture, local governments, and police. It also participates with the central government in decisions related to matters such as education and marriage. The MLAs have an incentive to influence development in their respective constituencies to increase the chances of reelection and they can do so through the following ways. Firstly, MLAs have complete access to the constituency development fund, the MLA-Local Area Development fund (MLA-LAD), which can be spent for building and improving infrastructure, such as schools, roads, street lighting, public toilets.[7] Secondly, MLAs can nominate members for block development committees (Wilkinson 2006) and monitoring committees for welfare schemes, such as the food grain public distribution system (Murray 2015a). Furthermore, MLAs can transfer bureaucrats (Iyer and Mani 2011), and bureaucrats can avoid audits or increase their chances of promotion by working together with the MLA (Gulzar and Pasquale 2017; Nath 2015). Thus, through their influence on the career of bureaucrats, MLAs have been able to attract public projects for their voters or secure public contracts for people from their network. This has been observed for some of the largest public programs in India, the National Rural Employment Guarantee Scheme (Gulzar and Pasquale 2017) and PGMSY, the nationwide rural road construction project (Lehne et al. 2018).

Process of Redistricting and Reservation in India

The Delimitation Commission defines the boundaries of electoral districts (or constituencies) during redistricting. Redistricting or delimitation divides states into equally populous constituencies using data from the latest census and is supposed to occur every 10 years.[8] The first redistricting took place in 1953, followed by the second and third in 1961 and 1971. But, there was no redistricting in the period 1971-2007. Evidence suggests that the freeze in redistricting was not because of any political manipulation (Bhavnani 2015). The reason for the freeze was to not punish states achieving lower population growth with lower representation in the state and national government. Hence, the latest redistricting in 2007 occurred after a gap of

7FL01 [7] The MLA-LAD scheme started in 1994-95. The amount of the MLA-LAD fund varies across states
7FL02 and has changed over the years, usually ranging between 20 million rupees to 40 million Indian rupees.

8FL01 [8] For the national elections, the country is divided into 543 electoral districts known as parliamentary
8FL02 constituencies. A parliamentary constituency is composed of several assembly constituencies. An assem-
8FL03 bly constituency always lies completely within a parliamentary constituency.

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three decades. Figure 9 in the appendix shows the latest redistricting led to a significant change in the boundaries of constituencies.[9]

The Commission also decides the reservation status of constituencies during redistricting. Assembly constituencies are classified according to their reservation status into three groups: unreserved or General (GEN), reserved for the Scheduled Castes (SC), and reserved for the Scheduled Tribes (ST). Figure 1 presents the distribution of constituencies based on their reservation status; a constituency that is either a SC or a ST constituency is labeled as reserved. The reservation procedure forms the basis of my empirical strategy, which I explain in the "Empirical Framework" Section.[10]

Theories and Conceptual Framework

Potential Impact of Political Quotas

Whether political quotas serve the purpose of benefiting the minorities or worsening the situation for the entire constituency remains controversial. One of the direct effects of quotas is that they guarantee representation of politicians of a particular identity, such as gender or caste. Several studies have evaluated the importance of identity of the politician for election or economic outcomes. For example, the gender of the candidate is believed to have favorable development outcomes in interests of the representative gender or the population (Chattopadhyay and Duflo 2004b; Clots-Figueras 2011, 2012; Iyer et al. 2012). But, reserving the position of chief in the local government for women led to a decrease in targeting of resources towards other underrepresented groups (Bardhan et al. 2010). Under caste and tribal quotas at the local level, where the chief of the local government belonged to one of these minorities, the evidence has been mixed; from weak distributive effects (Dunning and Nilekani 2013) to positive benefits (Bardhan et al. 2010; Chattopadhyay and Duflo 2004a; Gulzar et al. 2018). The religion of the political candidate has also been found to be important in influencing health and education outcomes (Bhalotra et al. 2014).[11] These studies are based on citizen-candidate models where the identity of the politician might influence his or her policy position or policy preference.

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[9] Sources of maps for Fig. 9: Old constituencies from Sandip Sukhtankar and Manasa Patnam, New constituencies from Devdatta Tengshe of Datameet. The states of Arunachal Pradesh, Assam, Manipur, Nagaland, Jharkhand, Jammu and Kashmir were not delimited in 2007.

[10] Further details on the process can be found on the website of the Election commission of India https://eci.gov.in/delimitation-website/index/.

[11] Such identity of the politician could potentially influence outcomes through many channels. Examples of such channels include higher complaints by women in presence of women leader about goods they prefer more (Chattopadhyay and Duflo 2004b), and bargaining power of the legislator (Pande 2003). Similarly, having MLAs from the same community can lead to a decrease in the cost of complaining for people from these communities, either directly or through local officials. MLAs have access to funds for development and are in a position to discuss issues that require attention in the state legislative meetings. Furthermore, MLAs themselves can be ministers of different departments, such as health, railway, and education, putting them in greater positions of power.

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But, it has also been argued that the identity of the politician does not matter if political party influence is higher (Jensenius 2015). Likewise, it has been argued that because politicians care about their own interests and careers, even elected officials who are members of the representative castes or tribes are unlikely to pay special attention to their own groups because their incentive is to try to please the majority population and, thus, the voter pool needed for them to remain in power.

Fear of quotas leading to negative effects is based on several hypotheses, such as that quotas could result in candidates who are ill-suited for the responsibilities of being a leader. Such candidates would have less bargaining power, be less effective in attracting resources for their constituencies. Such a situation would result in a worse allocation of resources to all the people in the constituency and would affect development. Another hypothesis put forward is that candidates in a reserved constituency could experience lower competition because people from the unreserved categories are ruled out from standing for elections. The leader from a reserved constituency can also take his powers for granted because the presence of the quota gives him a greater chance of remaining in power.

Similar concerns have been raised about affirmative action policies in education or employment. Critics have argued that such policies might lead to admission of students or hiring of employees who are ill prepared for the position, and this would be detrimental to their careers. However, Holzer and Neumark (1999) find that employees hired under affirmative action had lower educational qualifications but not lower performance. Using affirmative action policy in engineering colleges in India, Bagde et al. (2016) did not find any evidence of a mismatch between students and colleges. In case of political quotas, this question is important, as having people who are incompetent to be politicians may not only be detrimental for their own career but also for citizens of the state.

Apart from identities such as gender, caste, or ethnicity that a person is born with, there has been a recent emphasis on character of the politician. As mentioned in (Besley 2005; Akerlof and Kranton 2000) a politician has many characteristics that identify him and determine his quality. Characteristics such as criminality and level of education of politicians have also been observed to affect development (Prakash et al. 2019; Chemin 2012; Gehring et al. 2015; Besley et al. 2011; Lahoti and Sahoo 2020). Character of the politician is important for political selection of the candidate as well (Besley et al. 2005; Bernheim and Kartik 2014). However, the characteristics that are essential for a "good" politician might be difficult to define. These can be subjective characteristics such as charisma, personality, intelligence, integrity; or objective measures such as education, income, experience (Murray 2015b). In addition, quality of the candidate who is finally in office might be affected by the institutional setting and the method of political selection (Besley 2005). To explore if quotas could lead to politicians of different characteristics, I present a conceptual framework in the next section.

Conceptual Framework

The process of election in India and the final selection of a candidate in office can be understood using the following stages:

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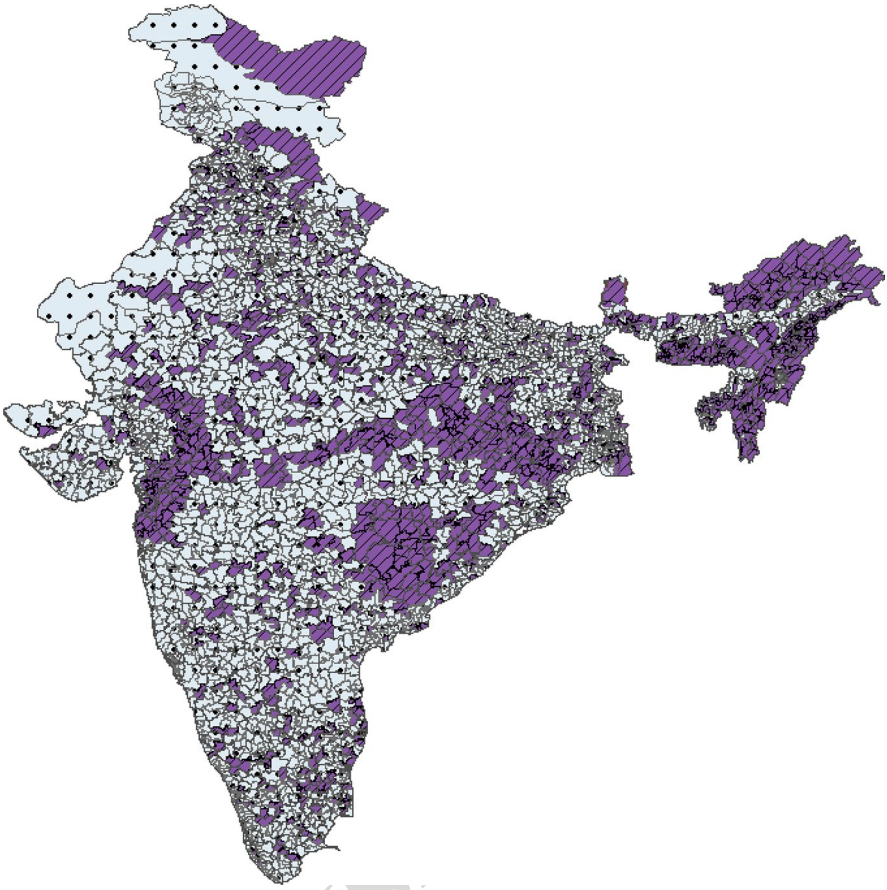

Fig. 1 Assembly constituencies of India. The dotted areas represent the unreserved or general constituencies whereas the striped ones represent the reserved constituencies

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Stage 1: Some citizens of India decide to run for political office from a constituency. The decision of a citizen to run depends on the cost (c_i) and return (R_i) from running.

Stage 2: Parties nominate candidates of type t_i, where $t_i = t(x_1, x_2, x_3, ..)$, a function of different attributes of the candidate $x_1, x_2, ..$ and others. Some examples of the attributes $x_1, x_2, ..$ are wealth, popularity, ability, or education level. A party may require some minimum qualification for a candidate to be eligible, $t_i >= \underline{t}$. A candidate has a value of $V(t_i)^w$ on winning and $V(t_i)^l$ on losing to a party, where the probability of win for the candidate is $p(t_i)$. For the purpose of generality, I am not assuming any restriction on the values of $V(t_i)^l$, and there can be situations in which the values are negative, positive, or zero. Similarly, not making assumptions regarding the relation between $V(t_i)^w$ and $V(t_i)^l$, or for value of the candidate to the party when $t_i = \underline{t}$.

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While selecting candidates, the parties would internalize preferences of the voters, but might also have its own set of desirable characteristics, such as loyalty to the party (Besley 2005). The $\underline{t}$ could be institutional restrictions for contesting elections, but also minimum criteria that a political party may have for the different attributes of a candidate or the $x's$. Once a candidate meets the minimum criteria, the party would want to select a candidate with the maximum expected value, $E(V(t_i))$, where $E(V(t_i)) = p(t_i)V(t_i)^w + (1 - p(t_i))V(t_i)^l$.

Stage 3: Several candidates contest from different political parties in a constituency and voters vote for their preferred candidate.

Finally, the candidate with highest vote is the winner or the Member of Legislative Assembly (MLA) who is responsible for functioning of the state government and for development in the constituency. This framework can also be generalized to other democracies that have a similar process of election.

Given that these stages would determine the outcome of elections for constituencies, if quotas influence the mechanism of an election in one or more of the stages, we can expect that this could lead to politician with different attributes in office. With the implementation of quotas, the difference lies in the fact that some constituencies gain a status of being restricted to citizens only belonging to certain castes or tribes. Several studies have assumed that the cost of contesting or the benefit from winning is different for people from the underrepresented group (Chattopadhyay and Duflo 2004b; Besley et al. 2005). Such restriction could alter the incentive of the agents involved in the above stages. For example, reservation could decrease the cost of contesting elections (c_i), or increase the return from contesting elections (R_i) for a candidate from the reserved group.

Similarly, the decision to contest may depend on being selected by political parties. During selection of candidates by parties, if belonging to the Scheduled Castes or Tribes is one of the x or the attributes for the type of a candidate, then this does not remain an unconstrained parameter in the reserved constituencies anymore. Caste of the candidate can be an attribute for selection by parties because it can also be a determinant of voter's preference. For example, voters could prefer candidates belonging to their own caste. Parties may internalize such preferences during their selection of candidates.

Therefore, whether candidates of similar attributes will emerge from a reserved or general constituency will depend on the distribution of t_i for the population and the reserved groups, or on the distribution of t_i for citizens who want to stand for elections in Stage 1. The selection will also depend on the selection of candidates by parties from the reserved and unreserved constituencies in Stage 2, and ultimately the candidates chosen by voters in Stage 3. Even in absence of quotas, the type of candidate selected could be different based on other factors, such as the population composition of the reserved or unreserved constituencies. Hence, to causally estimate the effect of reservation on otherwise similar constituencies, I use the empirical framework described in the next subsection.

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Empirical Framework

Empirical Strategy: Regression Discontinuity

The procedure of redistricting and assignment of reservation status to constituencies in India provides a quasi-natural experiment setting. The total number of constituencies reserved is proportional to the population share of the reserved group in India. Likewise, the number of reserved constituencies in a state is proportional to the population share of the reserved group in the state. Thus, a state with a higher fraction of the reserved population will have a higher proportion of reserved constituencies.

To maintain geographic heterogeneity of reservation for Scheduled Castes, there is an extra step of allocation of SC constituencies across administrative districts. The number of SC constituencies (or seats) entitled to a district is equal to the total number of SC constituencies allocated to the state multiplied by the relative population share of Scheduled Castes in the district. But, this number can be a fraction and is thus called the predicted number of SC constituencies for the district. Figure 2 shows the rule followed by the commission for final allocation of SC constituencies across districts, which has to be an integer, and is determined as a step function of the predicted number of SC constituencies for the district.

Following the allocation of constituencies, the next step is to determine the reservation status of the constituencies. To do this, the Delimitation Commission reserves constituencies with the highest population share of Scheduled Castes in the district, and highest population share of Scheduled Tribes in the state.

Using the procedure followed by the Commission, I am able to establish a discontinuous relation between the reservation status and population share of the reserved group in the constituency. To achieve this, I rank constituencies based on the population share of Scheduled Tribes within a state and Scheduled Castes within a district in a descending order. A rank of one implies highest population share of the reserved group. The number of constituencies reserved in the district for these castes (and in the state for these tribes) acts as the cutoff rank. Hence, constituencies with rank less than or equal to the cutoff have a reservation status of one. I explain the procedure in the form of an algorithm in "Procedure of Reservation" Section of the data appendix.

Figure 3 shows this for reservation of SC constituencies. Instead of using the discrete variable rank of a constituency, I use the continuous variable population share of Scheduled Castes as the assignment variable, and the population share of Scheduled Castes in the last constituency reserved (one with the cutoff rank) as the cutoff. Hence, all constituencies with percentage of Scheduled Castes population higher than the cutoff have a reservation status of one. I normalize the cutoff to zero. All other points are differences of the population share of Scheduled Castes from the cutoff, which I refer to as the deviation of the percentage of Scheduled Castes population. I follow a similar procedure for reservation of ST constituencies.

Figure 4 presents the relationship between the reservation of a constituency for Scheduled Tribes and the normalized population share of Scheduled Castes. The figure shows the probability of reservation of a constituency for Scheduled Castes

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increases by 0.95 on crossing the cutoff and not one. This arises due to a few exceptional cases. For example, a constituency may be eligible for reservation for both Scheduled Castes and Scheduled Tribes due to a high relative population share of the groups. In such cases, the constituency is reserved for Scheduled Tribes. Additionally, to distribute SC constituencies over the state, the Commission avoids spatially contiguous constituencies for reservation of Scheduled Castes. On observing the map of assembly constituencies, this seems to be an explanation for some cases and I discuss this further with examples in "Procedure of Reservation" Section of the data appendix.

Figure 4 also shows that there are far more unreserved constituencies compared to reserved constituencies, leading to fewer points on the right. Also, there are fewer constituencies with extreme percentages of Scheduled Castes populations. Table 1 provides the first stage estimates for SC reservation and the estimate obtained is 0.95. The estimate remains similar under various specifications, and choice of bandwidths.

As shown in Figure 5, on crossing the threshold for scheduled tribes population, the probability of a constituency being reserved for scheduled tribes jumps from zero to one.

Thus, the treatment effect for ST reservation can be estimated using a sharp regression discontinuity design. But for SC reservation, D_i is not a deterministic function of X_i. There is a discontinuous change in probability of the treatment status (D_i) at the cutoff, that is

$$\lim_{x \uparrow c} Pr[D_i = 1|X = x] \neq \lim_{x \downarrow c} Pr[D_i = 0|X = x] \tag{1}$$

and the change in the probability of treatment is less than one. Thus, the treatment effect for SC reservation is estimated using a fuzzy RD design.

I follow a non-parametric method of estimating the causal effect at the cutoff using local linear regression for all my analyses (Lee and Lemieux 2010). The coefficient of interest β for the fuzzy design can then be estimated by considering only observations close to the cutoff (c) as below:

$$\beta = \frac{\lim_{x \uparrow c} E[Y|X = x] - \lim_{x \downarrow c} E[Y|X = x]}{\lim_{x \uparrow c} E[D|X = x] - \lim_{x \downarrow c} E[D|X = x]} \tag{2}$$

Because the probability of being reserved for Scheduled Tribes jumps from zero to one at the threshold, the jump in the outcome variable is the average treatment effect, that is

$$\beta = \lim_{x \uparrow c} E[Y|X = x] - \lim_{x \downarrow c} E[Y|X = x] \tag{3}$$

To balance the trade off between bias and precision of the estimates, I consider observations within the Calonico et al. (2014) optimal bandwidth (CCT). I report the bias-corrected robust estimates that measure the average treatment effect at the threshold. For the main analysis of the paper, I focus on constituencies reserved for Scheduled Castes.

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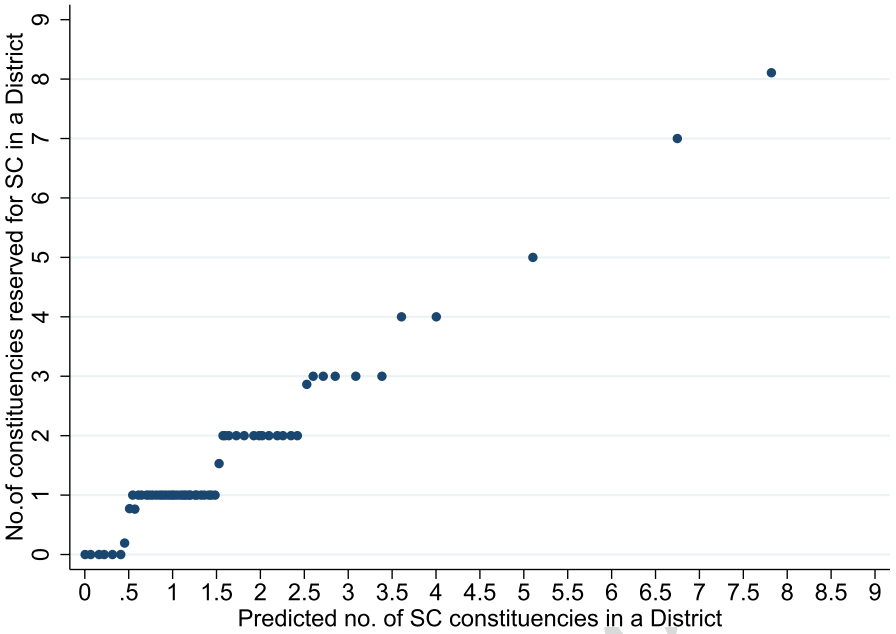

Fig. 2 District-wise allocation of SC Constituencies. The figure plots the number of SC constituencies allocated to districts vis-a-vis the predicted number of SC constituencies that a district was supposed to receive. The figure shows that the rule followed by the Delimitation Commission for the allocation resembles a step function

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Data and Summary Statistics

Redistricting data

I use the delimitation reports for each state to construct a dataset with the population and reservation status of constituencies. These reports from the Election Commission provide an accurate measure of population for the constituency. They contain the total population, the population of Scheduled Castes and Scheduled Tribes, the reservation status, and the administrative area of each constituency. For the analysis, I exclude the following observations from the sample: states that were not delimited in 2008, union territories in India that do not have legislative assemblies, and Delhi (which is a union territory but also the capital of India). This yields 3397 constituencies (of the 4120 possible constituencies) in 21 states. The current identification strategy is made possible by the availability of these delimitation data and can be used for future research.[12]

[12] The population of the constituencies for the earlier delimitations is not made publicly available. The other source of population is the Census of India. However, it is difficult to use the Census to obtain constituency-level populations because the Census provides population data only for administrative divisions.

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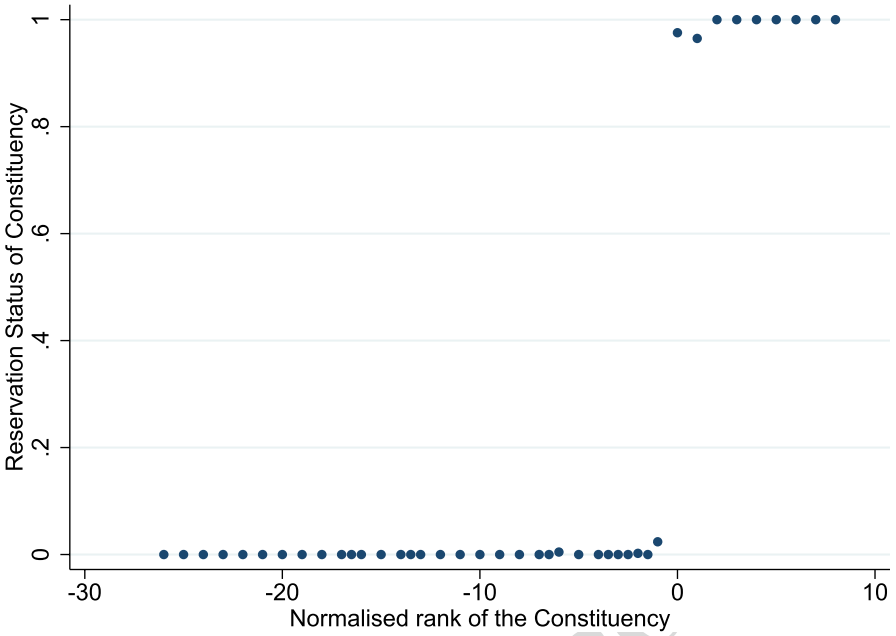

Fig. 3 Reservation Status and Rank of the constituencies. The figure plots the relationship between the reservation status of the constituency and the normalised rank of the constituency based on the percentage of Scheduled Castes population. The no. of SC seats in a district serve as the rank cutoff which has been normalised to 0

Data on Affidavits

To study the effect of quotas on the attributes of candidates, I use data on the candidate affidavits. In the wake of a 2002 Supreme Court ruling, all candidates seeking election to political office in India must file personal affidavits. The affidavits contain information on the gender, education level, criminal charges, and the assets and liabilities of the candidates. According to the Supreme Court order, the candidates are required to report details on i) past convictions ii) and prior to six months of filing, any pending accusations punishable with an imprisonment of 2 years or more, for which charges have been framed or cognizance has been taken.[13] The criminal

[13] Source: ADR affidavit data crawled from Myneta.com and cleansed by Trivedi Centre for Political Data (TCPD). I thank Gilles Verniers, Rajkamal Singh, and the TCPD team for providing the data and am grateful to Shivani Kapoor and the ADR team for answering my queries regarding the data. I add details on incumbents and perform few random checks from the Myneta.com website. For details on the implementation of the Supreme Court order and the veracity of the declaration by candidates, please refer to Bhavnani (2012), Vaishnav (2012), Prakash et al. (2019).

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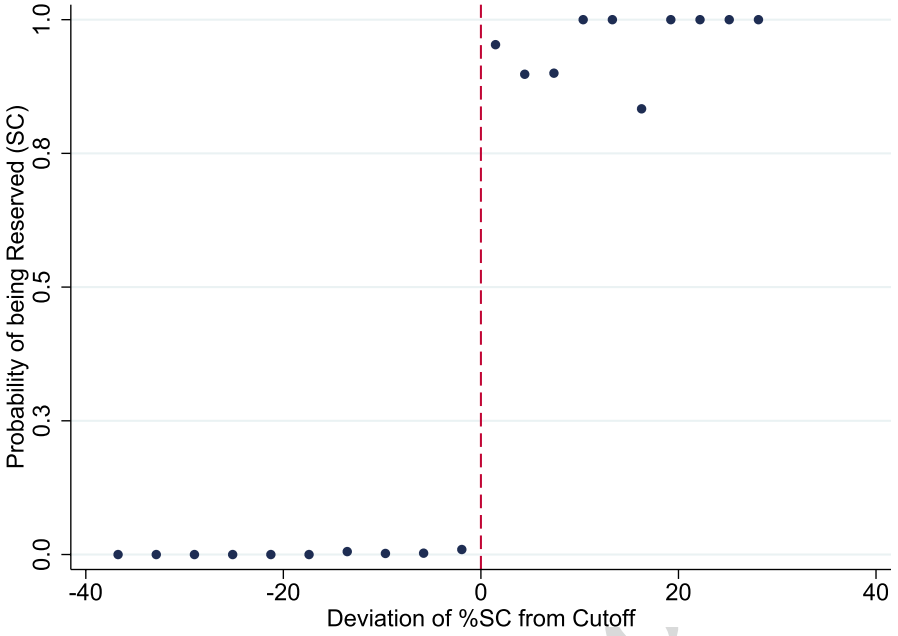

Fig. 4 First Stage: Scheduled Caste. The figure plots the relation between the reservation status of a constituency for Scheduled Castes and its percentage population of Scheduled Castes. The percentage population of Scheduled Castes corresponds to the number of constituencies to be reserved acts as the cutoff for this figure. The running variable has been normalized to have the cutoff of percentage population of Scheduled Castes as 0 and thus all other points are differences of the percentage population from the cutoff. The figure shows the probability of being reserved increases by 95 percentage points on crossing the threshold

Table 1 First stage estimates for SC Reservation

Variables	(1) Reserved for SC
RD estimate	0.941***
	(0.0150)
Observations	1,667
Bandwidth	CCT
Control	% of SC Population

The number of observations is the number of constituencies within the optimal CCT bandwidth (5.1). The standard errors are clustered at the district level. The estimates remain similar for different selection of bandwidths

Standard errors in parentheses

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

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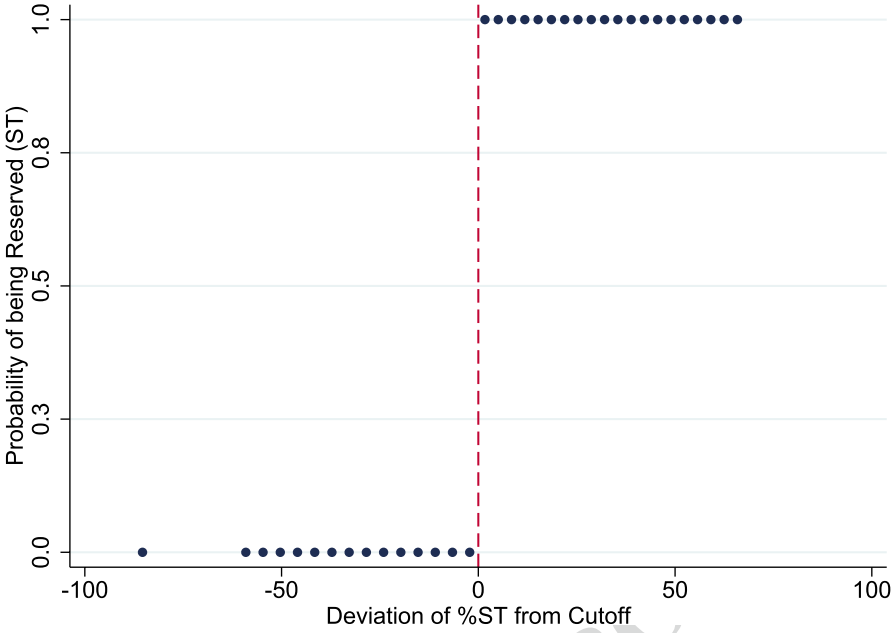

Fig. 5 First Stage: Scheduled Tribe. The figure plots the relation between the reservation status of a constituency for Scheduled Tribes and its percentage population of scheduled tribes. The percentage population of Scheduled Tribes corresponding to the rank cutoff acts as the cutoff for this figure. The running variable has been normalized to have the cutoff of percentage population of Scheduled Tribes as zero and thus all other points are differences of the percentage population from the cutoff. The figure shows the probability of being reserved is one on the right of the threshold

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charges include minor offenses, such as verbal abuse and civil disobedience, as well as serious criminal charges, such as rape, murder, kidnapping[14]. The pending criminal charges are not convictions, but not mere allegations either, that is, candidates disclose only charges for which a judge has determined enough evidence for a trial, hence, similar to an indictment in the US (Vaishnav 2012).

Table 2 summarizes the data on affidavits.[15] The table shows that political candidates from the reserved and unreserved constituencies differ significantly on most attributes. Candidates from general or unreserved constituencies have approximately thrice the assets compared to candidates from the reserved constituencies. The number of criminal charges including serious charges is higher on average for candidates from general constituencies, and there is no significant difference in the education

[14] The complete criterion for classification can be found in https://adrindia.org/content/criteria-categorization-serious-criminal-cases.

[15] Out of the sample of 3,397 constituencies, the data could be matched for 3,378 constituencies. I have considered affidavits of candidates for state elections from 2009 to 2014 for all the states in my sample that had at least one election after the redistricting. Recent data are available for some states that had a second round of elections after 2014; these data, however, do not have all the variables included in the previous data. The estimates for the common variables remain similar when including the recent data.

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level of candidates from the two types of constituencies. Representation of women in all constituencies in state elections is strikingly low; males represent 90 percent of candidates from reserved constituencies, and 94 percent of the candidates from unreserved constituencies.[16] Finally, fewer contestants view for office in reserved constituencies.

Voters Survey: To understand voters' preference about politicians and public facilities, I use the Daksh voter participation survey of 2014. The survey was conducted in 28 states and union territories of India and has 238,694 respondents. These data are unique for both the sample size and the extensive set of questions used.[17] The respondents provided their opinions on the performance of the leader, and the factors that influence their voting decisions. I summarize the responses of individuals by the caste of the respondent in Table 3. Panel A of Table 3 shows the characteristics of a political candidate that survey respondents consider to be important. People from the unreserved groups consider the caste or religion of the candidate more important compared to respondents from the reserved groups, and also value distribution of gifts by the candidate which is illegal.

Panel B of Table 3 summarizes information on how voters ranked the importance of different public goods and services, such as education, health, and agriculture. Participants indicated whether they considered certain services to be of high, low, or medium importance.[18]The table shows that approximately half of the respondents thought these were of high importance. The difference between the opinion of people from the reserved and unreserved group was significant, especially given the large sample size. More people from the Scheduled Castes and Tribes considered basic facilities of education, health, agriculture, and electricity to be of high importance in comparison to people from general castes. The table shows the system of job reservation which exists for the Scheduled Castes and Tribes in India, was of lesser importance to people from the general caste, who do not benefit from it.

Census Data: As a measure of public good provision, I use the 2001 and 2011 Census data, which contain information on facilities for all villages in India. This exercise required linking several datasets. This process was not straightforward. First, mapping administrative divisions to constituencies in India has been a challenge in the past, and several studies have followed different approximation methods.[19] Some papers have recently used mapping between villages and the old

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16FL01 [16] A positive correlation between the percentage of female candidates and the reservation status of con-
16FL02 stituencies, specifically after the 1990s, has also been observed in Jensenius (2016).

17FL01 [17] Daksh India conducted the survey, and I obtained the data from Datameet, a community of Data
17FL02 Science and Open Data enthusiasts. The survey was conducted in 490 parliamentary constituencies in
17FL03 28 states and union territories. The survey was regarding the Member of Parliaments (MPs) instead of
17FL04 MLAs. Nevertheless, the survey provides evidence to some extent about the perception of politicians.

18FL01 [18] The Daksh voter perception survey included many questions under each category. For example, under
18FL02 the category of agriculture, the questions addressed the importance of agriculture loans, prices of agri-
18FL03 culture commodities, irrigation, subsidies for fertilizers, and so on. To summarize the information, I cre-
18FL04 ate a dummy indicating "High importance" for each variable and find the average for the entire category.
18FL05 I followed the same procedure for the other categories.

19FL01 [19] For example, Blakeslee (2018) aggregates the values at the subdistrict level and maps these to Parlia-
19FL02 mentary constituencies.

Table 2 Attributes of candidates by reservation status of constituencies

	GEN	SC	ST
Total assets	21.57	6.68	7.51
Movable assets	7.10	1.54	2.20
Immovable Assets	14.47	5.14	5.32
Liabilities	3.39	0.72	0.74
Net wealth	18.18	5.96	6.77
No. of criminal cases	0.50	0.26	0.25
No. of serious criminal Charges	0.30	0.16	0.18
Has a criminal charge	0.19	0.13	0.12
Males	0.94	0.90	0.90
Age	44.68	44.57	44.89
No. of Candidates	13.44	11.43	8.37
College and Above	0.40	0.40	0.38
N	29,183	4,785	2,018

Information for candidates contesting state elections post 2008. The asset holdings are provided in million of Indian rupees (1 million rupees = 15,000 US dollars) and illustrates the average amount of assets held by a candidate from a constituency type

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447 constituencies (Jensenius 2015; Asher and Novosad 2017). But, with new bounda-
448 ries of constituencies, the villages have to be mapped to the new constituencies.[20]
449 Second, the Census 2001 and 2011 data use different village codes. After several
450 rounds of matching and cleaning, the final sample of 2,801 constituencies is used for
451 the analysis on public goods.
452 The Census data provides information on facilities available to the population liv-
453 ing in the villages of India. The data contain information on whether a village has
454 a facility, such as a primary school, a middle school, or a health center. I define
455 aggregate variables based on the different facilities. For example, the variable "Mid-
456 dle School or higher" in Table 4 is a dummy variable that takes the value of one if
457 a village has a middle school, or a secondary school, or a senior secondary school;
458 otherwise, the value is zero. I follow a similar strategy for other variables. I then
459 aggregate the data at the constituency level to find the percentage of villages in a
460 constituency with a facility.
461 Table 4 compares the average level of village facilities by reservation status of the
462 constituencies; 57.6 percent of the villages in a general constituency have a middle
463 school or above and 36.2 percent of the villages have a health center or a hospital.[21]

20FL01 20FL02 20FL03 20FL04 20FL05 [20] I sincerely thank Raphael Susewind for sharing the 2011 mapping between villages, and the new constituencies. The data are protected under the Open Data Commons Open Database license. I followed several procedures to check the consistency and correctness of the data, comparing them with other publications of the Delimitation Commission. See "Mapping Villages to Constituencies" Section of data appendix for details on the cleaning and modifications of the data.

21FL01 21FL02 [21] In the 2011 Census, almost all villages (approximately 95 percent) report having a primary school after the government's effort to ensure universal primary education in India.

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Table 3 Voters Opinion in India by Caste of the Respondent

	GEN	SC	ST	Gen versus SC	Gen versus ST	SC vs. ST
Panel A: Importance of characteristics of candidates						
Candidate	0.369	0.444	0.413	0.000	0.000	0.000
Party	0.245	0.249	0.298	0.136	0.000	0.000
Caste/Religion	0.206	0.091	0.109	0.000	0.000	0.000
PM candidate	0.222	0.185	0.188	0.000	0.000	0.437
Gifts distribution	0.098	0.052	0.063	0.000	0.000	0.000
Panel B: Importance of facilities to the voters						
Electricity	0.426	0.453	0.470	0.000	0.000	0.000
Health	0.446	0.486	0.502	0.000	0.000	0.000
Agriculture	0.401	0.419	0.436	0.000	0.000	0.000
Education	0.431	0.475	0.495	0.000	0.000	0.000
Transport	0.460	0.474	0.488	0.000	0.000	0.000
Job Reservation	0.394	0.416	0.429	0.000	0.000	0.004
Employment	0.474	0.474	0.485	0.868	0.001	0.001
Defence/Safety	0.394	0.395	0.403	0.511	0.001	0.010
N	81,818	41,325	18,985			

The table summarizes the responses of individuals in the Daksh Voter Perception survey by caste of the respondent. Panel A represents the percentage of respondents who think the mentioned characteristic of the candidate to be very important, whereas Panel B represents the percentage of respondents who considered the indicated facility to be very important. The last three columns represent the p-values testing statistical difference between columns 1 and 2, 1 and 3, and 2 and 3

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The reserved constituencies have a lower level of the public goods, but the difference between a general and a SC constituency is small. There has been convergence in the level of facilities, and the gap between the general and reserved constituencies has reduced in comparison to data from earlier Censuses (Banerjee and Somanathan 2007; Blakeslee 2018).

Regression Discontinuity Assumptions

The RD analysis is valid under certain assumptions: there must be no manipulation of the treatment variables around the cutoff; the covariates are balanced across the cutoff; and the assignment variable is continuous (Lee and Lemieux 2010). I provide evidence to support that each of these assumptions is satisfied.

Manipulation of the treatment variable would imply changing the percentage of the Scheduled Castes or Scheduled Tribes population relative to the cutoff to affect reservation status for some constituencies. This is unlikely for several reasons. Firstly, the process of delimitation happens after the population Census has been recorded and published. Redistricting is performed by the Delimitation Commission which has no connection to the Census Division of India. The population numbers are used for many other purposes apart from reservation of constituencies,

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Table 4 Level of village facilities by reservation status (2011)

Variables	GEN	SC	ST
Middle school or higher	0.576	0.554	0.499
Hospitals/Health Centres	0.362	0.328	0.314
Transport	0.626	0.575	0.473
Electricity	0.851	0.838	0.656
Credit facilities	0.313	0.270	0.152
Tap	0.643	0.595	0.495
Recreation facilities	0.518	0.536	0.471
Phone/Post Office	0.919	0.915	0.846
N	2048	490	263

The table presents the percentage of villages in the constituency having several public goods or facilities for the entire sample of 2801 constituencies by reservation status. In some cases the difference between the means are significant, but we can see that the gap even if significant is not large

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thus suspecting that they will be changed for the purpose of determining reservation status is far fetched.

Second, manipulating the variable for the population share of a Scheduled Caste or Tribe would be difficult, requiring perfect manipulation of the reserved population or the total population. Moreover, accomplishing this would also require manipulating the variable relative to the population of other constituencies to address the relative ranking of constituencies and, hence, their reservation status. Another way in which there could be manipulation would be through manipulating the electoral boundaries or gerrymandering. There has been evidence for the latest redistricting to be mostly politically neutral (Iyer and Reddy 2013; Bardhan et al. 2018) and the Delimitation Commission would not receive suggestions regarding the location of reserved constituencies (Jensenius 2013). To draw the boundaries for constituencies in a district, the commission proceeds in a zig-zag manner starting from the north, proceeding northwest and then turning south.[22] Additionally, the shape of constituencies as seen in Figure 1 reduces suspicions about gerrymandering.

The second assumption requires that constituencies do not differ in other characteristics discontinuously around the cutoff. I test for whether covariates (such as population size, population of other castes, average number of households, and the facilities) were balanced in the pre-period using data from the Census of 2001. Figure 10 in appendix presents the discontinuity plots for the covariates. The plots do not show any significant discontinuities around the cutoff for any of the variables. The final assumption of the assignment variable being continuous holds true because the percentage of the population of Scheduled Castes and Tribes is continuous in nature.

22FL01 [22] For more detail, please refer to https://eci.gov.in/files/file/6980-procedure/.

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Empirical Results

Effect of Reservation on Characteristic of Candidates

Figure 6 presents the RD plot for the attributes of candidates based on affidavits declared before the state elections. The figure shows that candidates running for office from SC constituencies have a lower level of total assets in comparison to candidates from non-SC constituencies. Candidates from SC constituencies are less likely to have a criminal charge, and they have fewer number of serious criminal charges against them. There does not seem to be a significant difference in the level of education between the candidates from these constituencies. The plot for the number of candidates shows there are fewer political candidates seeking office from SC constituencies.[23]

Table 5 presents the RD estimates. The assets are in millions of rupees (1 million rupees = 15,000 US dollars). It is clear that SC reservation causes candidates with lower total assets to stand for elections; assets are 76 percent lower, representing a magnitude of 9.7 million rupees (0.14 million USD).[24] Candidates from reserved constituencies are less likely to have a criminal charge (4.4 percentage points), 0.16 lower number of criminal cases and 0.13 lower number of serious criminal charges (33 percent and 43 percent lower compared to the mean of the control). The estimates imply that there is no difference in the level of education among political candidates from reserved or unreserved constituencies, which is in contrast to the overall statistic, where the levels of literacy and education are lower for the Scheduled Caste population. On average there also seems to be two fewer candidates contesting from SC constituencies, but the number of females contesting from the reserved constituencies is higher by 5 percentage points.[25]

Hence, restricting only people from Scheduled Castes to stand for elections from the SC constituencies led to candidates with lower criminal charges, lower assets, and increased the representation of females.[26] Jensenius (2017) performs a comparison of the MLAs (or the winning candidates) for elections between 2003–2007

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23FL01 [23] I present the analysis for SC reservation only. The results for ST reservation remain similar, but due to
23FL02 a smaller number of ST constituencies, the estimation is imprecise (results available upon request). Also,
23FL03 here the comparison is between constituencies reserved and not reserved for Scheduled Castes (but can
23FL04 be reserved for Scheduled Tribes).

24FL01 [24] The coefficient obtained on estimating the regression for logarithm of the total assets is -0.57 which
24FL02 translates to 0.76 on using $\exp^{beta} - 1$. There were around 850 cases in the entire sample with total assets
24FL03 reported as zero. The coefficients change slightly if I substitute for zero total assets with a value of one,
24FL04 or a number between zero and one, before taking the logarithm. The estimates in Table 5 exclude candi-
24FL05 dates with very high assets; candidates in the top 0.1 percentile.

25FL01 [25] For Table 5, I consider the bandwidth of equal length on the left and right of cutoff. However there
25FL02 are far more observations from unreserved constituencies than reserved. The estimates do not change if I
25FL03 consider unequal bandwidths (for example smaller bandwidth for to the left of the cutoff).

26FL01 [26] I also perform the analysis for candidates in national elections, in which case Parliamentary constitu-
26FL02 encies are reserved. I follow similar strategy of using the algorithm for reserving Parliamentary con-
26FL03 stituencies, and use an instrumental variables strategy to identify the effect. The analysis, provided in
26FL04 "Quotas in National Elections" Section of the appendix, shows the same relationship between reservation
26FL05 and attributes of candidates.

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(before delimitation) for 16 states using a sample of matched constituencies. For winners between SC and non-SC reserved constituencies, the author finds: almost no difference in the education profile, the SC constituencies have lower percentage of MLAs with criminal charges and they have lower wealth. However, SC politicians had lower educational level in the earlier period (Galanter 1984; Jensenius 2017), thus the results can change over time. I perform the analysis only for winners below for elections after the redistricting. Magnitude of the effect obtained in this paper is larger than the difference obtained in Jensenius (2017).

To investigate any heterogeneity in the results, I analyze the different sub-samples of candidates based on their party affiliation, whether they were winners, and their incumbency status.

Party Affiliation

Candidates can seek election in India either independently or through affiliation with a political party. To account for any difference between independent and party-affiliated candidates, I estimate the regression for the samples separately. Candidates may choose independent status if they were not selected by a party, or if they chose not to join a party because they did not find a party that aligns with their interests. Candidates with party affiliation from SC constituencies have lower asset holdings (13.17 million rupees/0.2 million U.S. dollars lower, on average); they are less likely (by 6 percentage points) to have a criminal charge than party-affiliated candidates from non-SC constituencies. The estimates remain negative for the sample that includes only independent candidates; estimates are lower by approximately 50 percent and are insignificant for the asset and criminality variables, although imprecisely estimated. The estimates however are negative and significant for the number of males and number of candidates. Thus, the difference is more pronounced for candidates that are selected by parties. The difference is also significantly higher for candidates selected by major parties.[27]

Incumbents and Winners

Incumbents may have a different probability of winning or value to the party, such as they can be expected to have some incumbency advantage.[28] Additionally, assets of a politician could grow as he is in office (Bhavnani 2012) and thus incumbents from constituencies can be expected to have higher assets. Thus, I also perform the

[27] Results for independent candidates and major parties are available upon request.

[28] There has been mixed evidence regarding incumbency advantages in India. Some papers have found that incumbency provided an advantage before 1991 but a disadvantage later (Linden 2004; Anagol and Fujiwara 2016; Uppal 2009). However, recent research shows that after mandating declaration of the affidavits in 2002, also led to incumbency advantage because worse candidates chose not to run for office (Fisman et al. 2016). Thus, the long-established incumbency disadvantage of politicians in India may be reversing now as winners of last election may not want to contest again if they have low chance of winning and were involved in corruption as they have to declare their assets if they decide to recontest.

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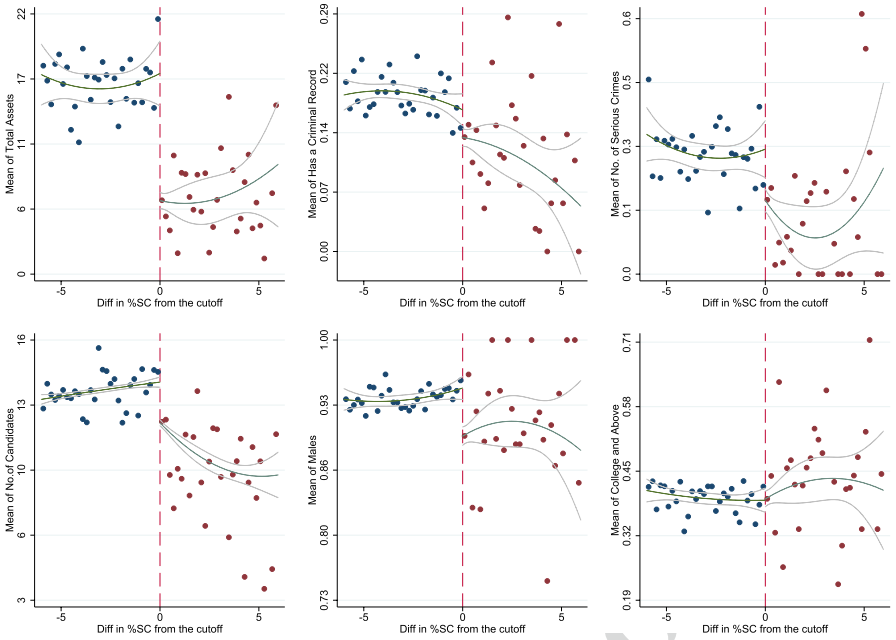

Fig. 6 Quotas affect the attributes of Candidates. The figure plots the asset holding and criminal charges of candidates based on self-declared affidavits. The figure shows that the candidates contesting elections from SC constituencies have lower assets and lower criminal charges against them. There is not a significant difference in the proportion of college graduates among the political leaders on average

analysis for only the non-incumbents who would not have an incumbency advantage. The table shows that the results hold for non-incumbents as well.

Winners by definition can be considered to be the strongest candidate in both the reserved and unreserved constituencies. To explore whether the difference is observed for even the strongest candidates from both constituencies, I perform the analysis for winners only. With respect to winners, who are also the elected official or the MLA, the effect is much larger.

One of the reasons for obtaining the above results could be that people from the reserved groups are more honest or have lower wealth in general, and therefore candidates from these groups have the same attributes too. But, that does not seem to be the case. This is also intuitive as it is unlikely that politicians are a random draw from the population. Unfortunately, lack of data prevents verifying this hypothesis by determining the level of criminal charges or asset holdings for the entire population. I instead provide some other statistics to infer the characteristics of the population. For example, 3.7 percent of Scheduled Castes older than 15 years have an educational qualification of "graduate and above"; the comparable figure for people belonging to non-reserved categories is 10.6 percent.[29] But, there is no difference

[29] Source: NSS report on Employment and Unemployment, 2011-2012. The numbers are reported using the classification of SC, ST, Other Backward Castes (OBCs), and "others" in these reports. The percentage of graduates and above: from the SC (3.7 percent), ST (3.1 percent), OBCs (6.2 percent), and others (15 percent). People from the "others" category have the highest educational qualifications.

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Table 5 Quota affects attributes of candidates

Variables	(1) All candidates	(2) Party candidates	(3) Winners	(4) Non incumbents	(5) Mean
Total assets	− 9.726***	− 13.175***	− 39.471***	− 8.071***	16.05
	(1.846)	(1.995)	(10.064)	(1.823)	(0.44)
Immovable assets	− 7.182***	− 9.145***	− 29.076***	− 6.060***	11.64
	(1.582)	(1.357)	(6.436)	(1.607)	(0.33)
Has a criminal charge	− 0.044***	− 0.060***	− 0.138***	− 0.042***	0.19
	(0.012)	(0.015)	(0.048)	(0.012)	(.003)
No. of criminal cases	− 0.159***	− 0.208***	− 0.885**	− 0.141***	0.48
	(0.048)	(0.066)	(0.371)	(0.044)	(.01)
No. of serious charges	− 0.129**	− 0.164**	− 0.678**	− 0.114**	0.29
	(0.050)	(0.067)	(0.275)	(0.047)	(.01)
No. of candidates	− 2.086***	− 2.103***	− 1.469***	− 2.109***	13.48
	(0.654)	(0.559)	(0.466)	(0.666)	(.04)
Males	− 0.056***	− 0.063***	− 0.084**	− 0.059***	0.94
	(0.009)	(0.011)	(0.037)	(0.009)	(.002)
College and above	− 0.006	− 0.031	− 0.058	− 0.001	0.4
	(0.016)	(0.021)	(0.055)	(0.017)	(.004)
Age	0.019	− 0.652	− 3.519***	0.260	44.7
	(0.425)	(0.503)	(1.251)	(0.437)	(0.0895)
Observations	20,280	13,118	1,768	19,363	15,752

Column 5 is the mean of the control group for all candidates. All the specifications include the percentage of Scheduled Castes population in the constituency and states as control. The estimates obtained are based on Calonico et al. (2014) which implements robust bias corrected local polynomial RD point estimators and an equal bandwidth of 6 for both sides has been considered. Candidates with total assets above the 999th quantile have been dropped to confirm the results are not being driven by candidates with exceptionally high assets. The results hold on excluding candidates in the top 1 percentile as well, but the estimates decrease slightly. The optimal CCT bandwidth was approximately equal to six for all variables. The number of observations indicate the sample within a bandwidth of six and for linear polynomial. The estimates remain similar for different polynomial specifications and selection of bandwidths

Standard errors in parentheses

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

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582 in the level of education of the political candidates. Similarly, the rate of rural pov-
583 erty is 31.5 percent for the Scheduled Castes population and 22.7 percent for those
584 in non-reserved categories. Thus, the rate of rural poverty is 38 percent higher for
585 members of the Scheduled Castes populations. The magnitude of the difference
586 between urban poverty is similar. This suggests that the magnitude of difference we
587 observe among political candidates from reserved and unreserved constituencies is
588 not driven solely by the difference in characteristics of the population.[30]

30FL01 [30] Although in a general constituency, people from all castes can seek election, candidates from the
30FL02 higher castes dominate (Pande 2003; Nath 2014).

The results suggest strategic selection by parties in Stage 2 of the conceptual framework, since the estimate is significantly larger for party-affiliated candidates than for independents. One major difference between general and reserved constituencies is that in the reserved constituencies *all* the candidates belong to the Scheduled Caste; hence, the competition is not on the basis of Scheduled Caste status, and there is no possibility of choosing someone from the other unreserved castes. But, in the general constituencies, there might be a preference of politicians from the same caste or higher caste. So, parties speculate whether they can win on the basis of the caste of the candidate even if the candidate is a criminal. Strategic nomination might also encourage a party to nominate criminal candidates if other opposing parties are doing so; party leaders may believe that they need someone equally "powerful"; or because criminality could be effectively neutralized as a dimension for voters to make their choices if candidates of opposing parties had criminal charges.[31]

Finally, following the overall pool of candidates who have different attributes, the estimates for winners in Stage 3 show a similar result. Selection of and winning by criminal candidates in India has received significant attention. Nevertheless, how or why candidates with serious criminal charges win elections has remained an interesting question. There can be different scenarios under which criminal candidates manage to win elections. First, voters may not be aware of criminal charges against a politician; if informed they would not prefer such candidates (Banerjee et al. 2011, 2014; Ferraz and Finan 2008). Second, the voter may be aware of criminal charges but does not consider them to be true, or voters perceive it as normal for political candidates to have such charges, and the charges are of no consequence to them. Alternatively, criminal charges may signal that the candidate is someone powerful, and thus capable of protecting the citizens of the constituency from other powerful "criminals" (and politicians) (Vaishnav 2012). Furthermore, voters may not be able to judge a candidate on the basis of criminality if other strong candidates also have criminal charges.

In open or unreserved constituencies voters may choose candidates with criminal backgrounds if they prefer other characteristics of the candidate, such as the candidate's caste. Using data from the voter perception survey, I find that people from the unreserved castes cared more about the caste or religion of the candidate; in all, 20 percent of the respondents from the general caste considered the caste or religion of the candidate to be very important; this compares to 9 percent of respondents from the reserved castes. Such caste-based voting can lead to the election of people of lower quality (Banerjee and Pande 2007). It is possible that, because people in reserved constituencies effectively cannot vote based on caste, they may be interested in finding out other attributes, or they may care more about the other attributes

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[31] Correlation between party affiliation, criminality, and availability of assets has been observed in the past (Duraisamy and Jérôme 2017; Vaishnav 2012; Dutta 2015). Candidates with high assets are strongly preferred by parties because such candidates can provide additional funding to parties for elections or for any emergency (Dutta 2015; Besley 2005; Mukhopadhyay 2014). Parties may select candidates with a criminal past to intimidate the voters from opposing parties (Aidt et al. 2011) or if the criminal candidates have an electoral advantage in constituencies where the party faces strong competition (Dutta 2015; Mukhopadhyay 2014).

of a person as they cannot vote based on caste. By contrast, in unreserved constituencies, the median voter may have more preference of selecting someone from high caste and not make the effort to be informed about other attributes of a person.

Effect of Reservation on Provision of Public goods

Figure 7 presents the RD plots for the presence of schooling, health, and transportation facilities, and for electricity availability based on data from the 2011 census.[32] The plots show that there is no significant difference in the level of facilities between SC and non-SC constituencies that are close to the cutoff. The RD estimates for the variables are provided in Table 6. The top row represents estimates without state-fixed effects, whereas the bottom row represents estimates on including state-fixed effects. The estimates are small, and they decrease with the inclusion of state-fixed effects. The estimates become negative for all the three variables, but remain insignificant. The standard errors have been clustered at the district level, and the null result obtained is precise.

The largest effect can be observed for the variable "Middle School or higher" with state-fixed effects. The estimates imply that on being reserved for SC, percentage of villages that have a middle school or higher decreases by 2.3 percentage points. Considering the standard errors, any effect larger than a decrease of 4.2 percentage points can be ruled out. The average number of villages in a SC constituency is 150, and thus we can expect three to four villages to be affected. This would amount to a maximum of 5,000 people to be affected.[33]

The RD analyses for credit, recreation, drinking water, and communication facilities are presented in Figure 8. Although there is no significant difference in the facilities, the graph shows a decrease in the availability of credit facilities as one move towards constituencies with higher percentage of Scheduled Castes population. Table 7 provides the estimates for the above variables; the largest effect is observed for the variable "Credit facilities". The null result obtained is precise, and any effect greater than 4.6 percentage points can be ruled out. The results obtained for ST reserved constituencies using the sharp regression discontinuity design also lead to insignificant results. The results are provided in Figures 11 and 12 in the appendix.

The regression discontinuity results indicate that the level of village facilities in a reserved constituency is similar to the level in a comparable unreserved constituency in 2011. It is important to note that the result is for the overall effect of a quota or reservation status. The main channel through which quotas can affect provision of public goods is through the politician or leader. But, there can be other channels, too, through which quota might affect development. For example, the central government might want to direct more resources towards the reserved population, in which case they could direct resources to constituencies labeled as reserved.

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32FL01 [32] I have restricted my analysis to districts with at least one SC constituency.

33FL01 33FL02 33FL03 [33] Considering that 70 percent of India's population is rural, this amounts to 0.83 billion people in 600,000 (0.6 million) villages. Therefore, one can estimate that, on average, 1,383 people reside in a village. This implies a maximum of 5,000 people living in three to four villages.

Usually, the effects of quotas have been used interchangeably with the effects of the leader; however, it is difficult to rule out offsetting heterogeneous effects or complementariness between these channels.

There can be several possibilities for the null result. First, based on the leader channel, and in line with previous findings, it is possible that the influence of the party is higher, and that the MLA is taking actions based on party decisions. Moreover, the intentions of a leader from the reserved or unreserved constituencies may not be very different; both leaders might cater to people from the reserved communities and provide the basic facilities to gain their votes. But, in the alternative scenario - that is, in absence of reservation –there is a higher chance of having a politician from the unreserved groups, even in the current reserved constituencies. Thus, most likely there will be lower representation of leaders from the reserved groups. Also, if we hypothesize that leaders from reserved groups are puppets in the hands of the party, it is difficult to know if leaders from unreserved groups in a similar constituency would avoid being puppets in the hands of the party, or rule without fear of losing due to a weak opposition. Second, this is the situation as of 2011, and convergence in these constituencies with respect to the facilities in villages has been observed.

Robustness Checks and Additional Analysis

A possible caveat in the analysis for public goods is that the new reservation status was effective in state elections after the redistricting in 2007. Some states held elections only a year prior to the 2011 census, and, thus, the new reservation status had been in effect for a shorter time. To address this, I rerun the analysis by restricting the sample to states that had elections at least two years before the 2011 census. The results are presented in Table 8 in appendix. There is no change in the nature of results obtained. Some areas have been in a reserved constituency for a longer time than others. However, the boundary changes of constituencies make it difficult to perfectly control for the duration of reservation status of constituencies. Nevertheless, these changes should not affect the nature of the results to a great extent. Moreover, Jensenius (2015) obtains similar insignificant results on development in observing the effect of the reservation status over a longer time horizon of three decades, during which no change in boundaries or reservation status took place.

I also examine if any change occurred in the intensive margin of the village facilities; whether the number of such facilities in the villages changed. The census provides information on the number of village facilities for all the items under each category, such as number of middle schools, number of secondary schools, and so on. But, aggregating these variables to have a total number for the entire category is difficult because of possibilities of double counting. I perform the analysis for the disaggregate variables; the results do not change with regard to the discontinuity. Finally, I test whether any change occurred in the growth of the village facilities using a panel of villages in 2001 and 2011. Doing so was difficult because the boundaries of constituencies had changed due to the latest redistricting. I obtain

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Table 6 No difference in village facilities between SC and non-SC constituencies

Outcome	(1) Middle school or Higher	(2) Health centers	(3) Transport	(4) Electricity
Reserved for SC	−0.0123	0.0163	0.0083	0.032
	(0.0287)	(0.0272)	(0.0379)	(0.0348)
Observations	1490	1530	1673	1887
Reserved for SC	−0.0234	0.00087	−0.0139	−0.0133
	(0.0190)	(0.0172)	(0.0147)	(0.0191)
Observations	1345	1373	1456	1525

The estimates obtained are based on Calonico et al. (2014) which implements robust bias corrected local polynomial RD point estimators. Estimates with and without controlling for states are included in the bottom and top panel, respectively. The estimates remain similar for different polynomial specifications and selection of bandwidths. The number of observations indicate the sample within the optimal CCT bandwidth (which is approximately 5 for all variables)

Standard errors in parentheses

$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

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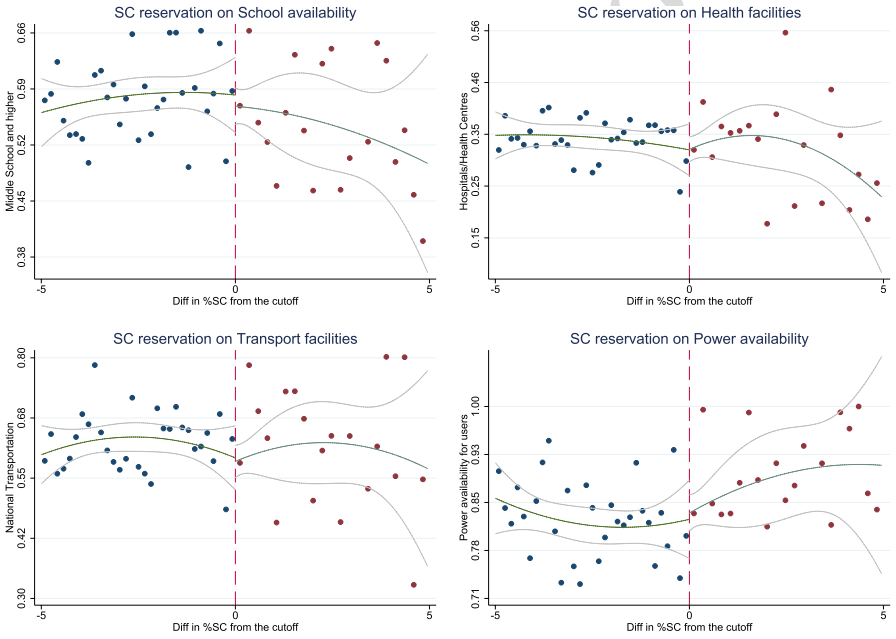

Fig. 7 No difference in level of village facilities. The insignificant results remain similar on different polynomial specifications or choice of bandwidth

similar null results and the analysis is provided in "Growth in Facilities" Section of the appendix.

Table 7 No difference in village facilities between SC and non-SC constituencies

Outcome	(1) Credit facilities	(2) Recreation facilities	(3) Tap	(4) Phone/Post Office
Reserved for SC	−0.0140	−0.0007	0.0326	0.0071
	(0.0298)	(0.0305)	(0.0448)	(0.018)
Observations	1540	1866	1948	1840
Reserved for SC	−0.0269	0.0069	−0.0147	0.0018
	(0.0190)	(0.0189)	(0.0178)	(0.0127)
Observations	1285	1514	1522	1560

The estimates obtained are based on Calonico et al. (2014) which implements robust bias corrected local polynomial RD point estimators. Estimates with and without controlling for states are included in the bottom and top panel, respectively. The estimates remain similar for different polynomial specifications and selection of bandwidths. The number of observations indicate the number of constituencies within the optimal CCT bandwidth (which is approximately 5 for all variables)

Standard errors in parentheses

$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

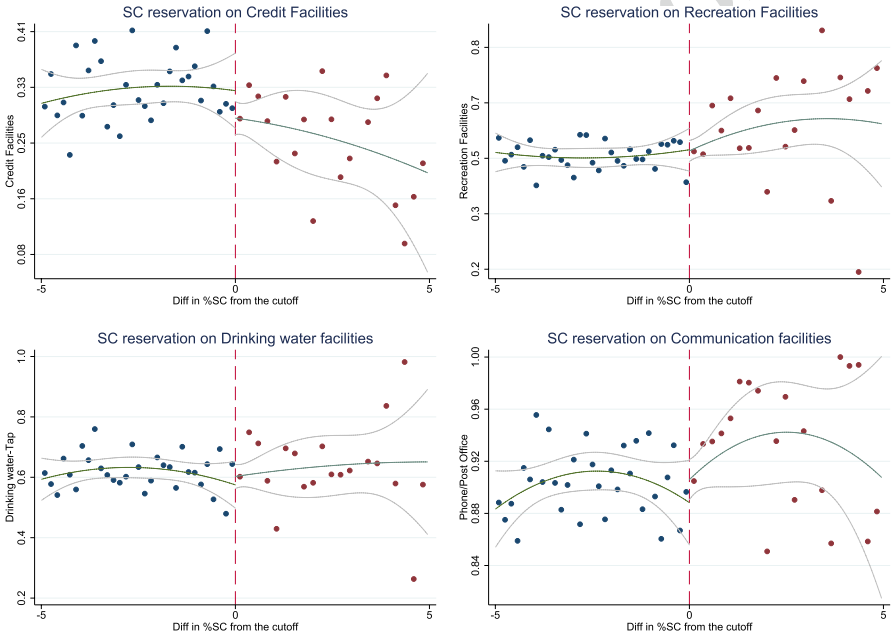

Fig. 8 No difference in level of village facilities. The insignificant results remain similar on different polynomial specifications or choice of bandwidth

Village Level Analysis: To address the fact that aggregation of village-level facilities might average out effects faced by individual villages, I examine the change in facilities for individual villages that were affected by the latest redistricting. For this, I use the change in boundaries due to the redistricting as an exogenous shock. This

led to villages changing constituencies and, in some cases, also reservation status. The analysis for the same is provided in "Village Level Analysis" Section of the appendix. I find similar insignificant results. Additionally, earlier papers in the literature have analyzed the effect of reservation of constituencies at the district level, that is, how having an assembly constituency reserved affects districts. "District Level Analysis" Section in the appendix provides discussion of carrying out a similar analysis in the recent setting.

Conclusion

Affirmative action policies are widely practiced to increase the opportunities available to minorities, but they remain controversial. In politics, around a hundred of countries across the world use political quotas to guarantee representation for the minorities. This study examines the effect of quotas on the attributes of political candidates and on the provision of public goods. Using latest data from India and regression discontinuity, I find that candidates from reserved constituencies (bound by quotas) differ in characteristics from the unreserved regions (not bound by quotas). In particular, the system of political quotas has given rise to a selection of candidates who have lower financial assets and who are less likely to have criminal charges. Education levels of candidates are similar, regardless of whether quotas are in place. Quotas designed to ensure the representation of Scheduled Castes and Tribes have increased the representation of women, even though this was not the stated intent. There is also no significant difference in the level of public goods currently available in rural India between constituencies that are reserved and not reserved.

It is worth mentioning that there might be other unmeasured or psychological gains of having political leaders from reserved categories of castes and tribes. Such candidates may act as a role model, and they make people from the reserved groups more comfortable in approaching political authorities, who could also perhaps understand their problems better. The fraction of political candidates and winners from the reserved groups and women are significantly low in the unreserved constituencies. This may imply it is unlikely for people from the minorities to gain representation in absence of quotas.

Quotas in the form of mandated political representation continue to exist in India, and there have been several demands for extending them to people from other categories. Understanding the current relevance and different impacts of quotas that were implemented several decades ago (since 1951) would help in creating and revising effective policies. Additionally, understanding the defining attributes of a "good" politician remains an open question. Precise knowledge of the desired attributes could help in determining appropriate eligibility requirements for political candidates. Policies to increase voter awareness regarding the characteristics of candidates could lead to candidates with undesirable characteristics losing their electoral advantage. Furthermore, knowledge of the complementariness between different

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attributes and performance of a politician might help to better understand the different channels of influence of various institutional policies.

A Appendix

A.1 Additional Figures and Tables

Figures 9, 10, 11, 12.

Table 8.

Fig. 9 Change in boundaries of constituencies due to latest Redistricting. A sample of the boundaries of assembly constituencies before and after the latest redistricting which occurred after a gap of three decades. There seems to be a significant change in the boundaries of the constituencies

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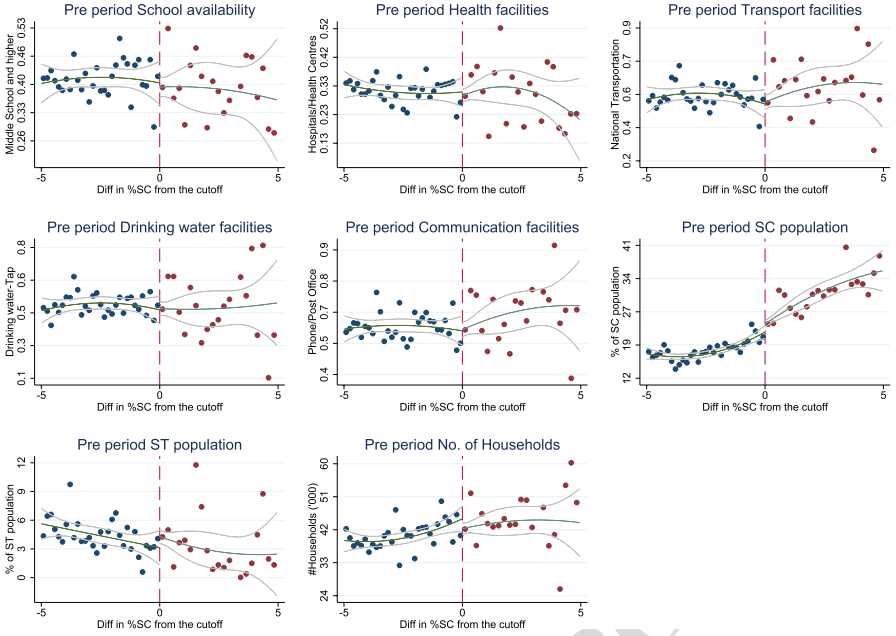

Fig. 10 Covariates balance test for RD validity. Data from Census 2001 is used to calculate the pre-period covariates. The plot shows absence of discontinuity at the cutoff for any of the covariates

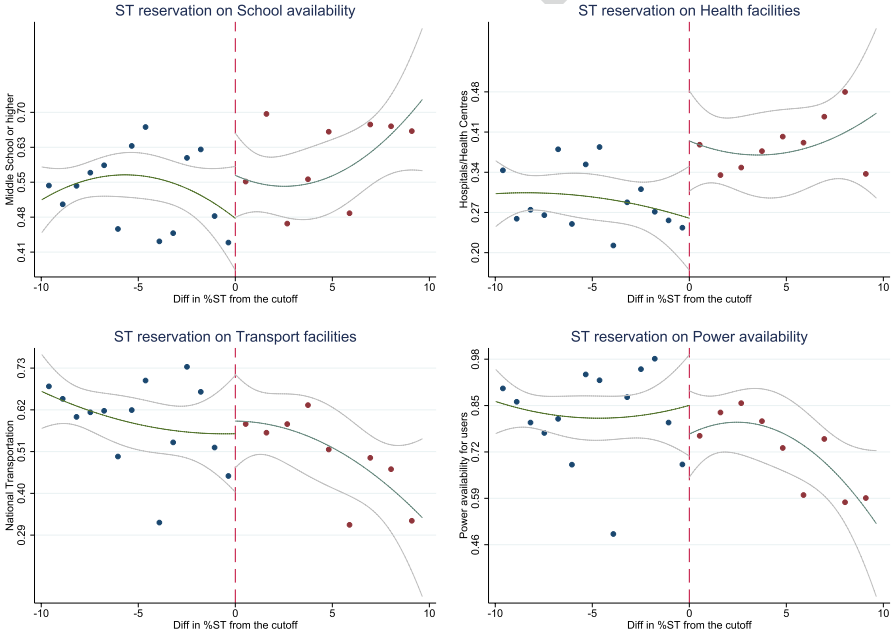

Fig. 11 Effect of ST reservation on Level of Village Facilities. The confidence intervals are large due to small number of constituencies reserved for scheduled tribes. There does not seem to be a difference across reservation status of constituencies. Some positive effect on health facilities seems plausible

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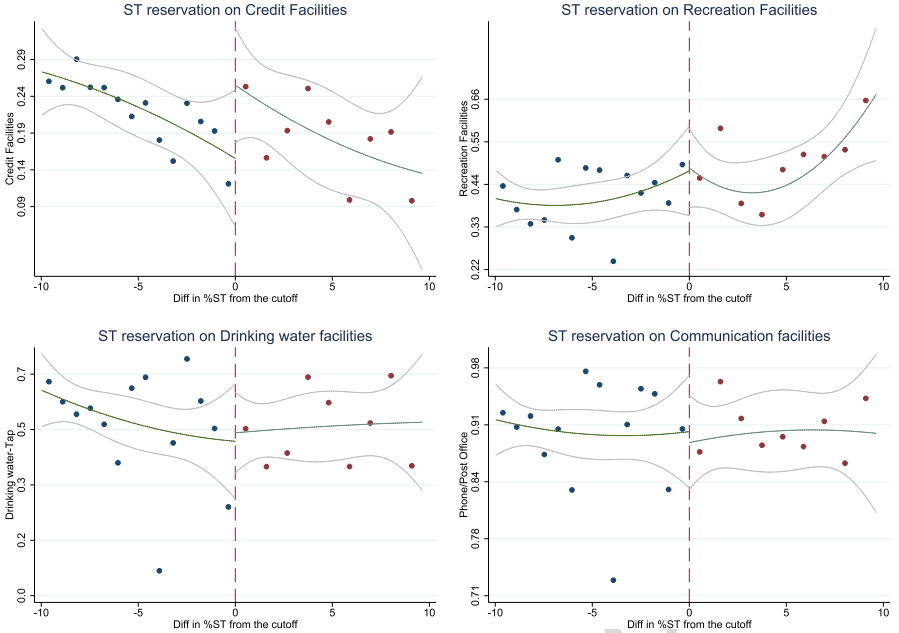

Fig. 12 Effect of ST reservation on level of village facilities. The figure does not suggest a difference between the levels of recreation, drinking water and communication facilities across unreserved and reserved constituencies. However, not many villages seem to have credit facilities and the availability decreases for constituencies with higher percentage of Scheduled Tribes population

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Table 8 Controlling for number of years from elections to Census

Variables	(1) middle school or higher	(2) Health centers	(3) Transport	(4) Electricity	(5) Credit facilities	(6) Recreation facilities	(7) Tap	(8) Phone/Post Office
Reserved for SC	−0.029	−0.019	−0.033	−0.001	0.023	−0.015	−0.046	−0.013
	(0.035)	(0.039)	(0.056)	(0.016)	(0.047)	(0.056)	(0.059)	(0.016)
No. of observations	530	549	532	550	501	534	537	550

The table presents estimates for constituencies which had a gap of more than 2 years from the state elections to the Census. The results remain similar and insignificant. The number of observations indicate the number of constituencies within the optimal CCT bandwidth

Robust standard errors in parentheses

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

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B Data Appendix

B.1 Procedure of Reservation

The total number of assembly constituencies (ACs) in India has remained constant at 4,120. The number of reserved constituencies depends on the relative share of the reserved group and may change with the population growth. The total number of constituencies reserved for Scheduled Castes (SC) or Scheduled Tribes (ST) can be derived using the below formula:

$$\text{Total No. of ACs reserved for SC (ST)} = \frac{\text{Total Population of SC (ST) in India} * 4120}{\text{Total Population of India}}$$

The number of constituencies allocated to a state depends on the population share of the state:[34]

$$\text{No. of ACs in a State} = \frac{\text{Population of state} * 4120}{\text{Total Population of India}}$$

and the number of constituencies reserved in each state is based on the population share of the reserved group, that is

$$\text{No. of ACs reserved for SC or ST in a State} = \frac{\text{State Population of SC or ST} * \text{No. of ACs in the State}}{\text{Total Population of the State}}$$

For example, consider the state of Madhya Pradesh. The population numbers according to the 2001 census is as below:

2001 Population= 60 million

2001 SC Population= 9 million

2001 ST Population= 12 million

The total number of ACs allocated to the state is 230 out of 4120. No. of ACs reserved for SC in a State $= \frac{9*230}{60} = 34.89 = 35$.

Likewise, the number of ACs reserved for ST in a State is 41.

The Delimitation Commission divides the state into constituencies with similar population levels.

To maintain geographic heterogeneity for SC constituencies within a state, there is allocation of SC constituencies (seats) across districts. The number of predicted SC constituencies for a district can be derived using the following formula:

[34] But, the 2001 population was not used to allocate constituencies across states. Thus, the number of constituencies allocated to states remained the same in the latest delimitation.

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$$\text{Predicted No. of SC seats in a District (X)} = \frac{\text{District Population of SC} * \text{No. of SC seats in the State}}{\text{Total Population of SC in the State}}$$

From the formula above, the predicted number of constituencies, or X, can be a fraction. Since the number of constituencies cannot be a fraction, the Commission uses the following criteria to obtain the number of SC constituencies for a district:

Range of X	SC seats
0–0.5	0
0.5–1.5	1
1.5–2.5	2
2.5–3.5	3

To illustrate further, the state of Madhya Pradesh has 48 districts and 35 SC constituencies. Let us consider the district of Sheopur in Madhya Pradesh: Sheopur has approximately one percent of the SC population of the state, hence the predicted number of SC constituencies for Sheopur = $.01 * 35 = .35$. Since $.35 < .5$, the number of SC constituencies allocated to Sheopur is zero.

But, the district Morena has 3.6 percent of the SC population of the state, hence the predicted number of SC constituencies for Morena = $.036 * 35 = 1.28$. Since $1.28 < 1.5$, the number of SC constituencies allocated to Morena is one. For the district Sagar, the predicted number is 1.59 which is greater than 1.5. Therefore, the district Sagar is allocated two constituencies as reserved for SC. Figure 2 represents the underlying step function used for allocation of SC constituencies to districts.

After the allocation of SC constituencies to a district, the Commission reserves constituencies with the highest SC population in the district. Hence, out of the six constituencies in the district Morena, the constituency Ambah with the highest SC population is reserved. Whereas, for the district Sagar, the constituencies Naryoli and Bina, with the highest and second highest SC population are reserved. For ST reservation, there is no extra step of allocation across districts. Thus, the Commission reserves the 41 ACs with the highest ST population in Madhya Pradesh for ST.

Some exceptional cases leading to Fuzzy RD for SC reservation

When a constituency is eligible for both SC and ST reservation: An example of this is the constituency of Habibpur in the state of West Bengal. It has the highest Scheduled Castes population in the district of Maldaha, but because of its high scheduled tribe population in the state, the district received reservation for such tribes. Another situation is when a district is not assigned any reserved seat for scheduled castes, even though, according to the rule, it must receive one. This can happen if the total number of seats a state should receive is less than the sum of the individual entitlements of the districts. For example, based on the population share of Schedule Castes relative to other states, the state of Haryana has an allocation of 17 scheduled caste seats. But, the number of districts in the state is 19. Based on the rule for assignment within districts, each of the 18 districts should receive one scheduled caste constituency. Thus, the district of Mahendragarh with the lowest

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Fig. 13 Skipping a spatially adjacent constituency for SC reservation. Source of the figure: http://www.cmsir.com/tdp/mla-profiles/. The figure has been modified slightly for presentation

scheduled caste population share does not receive any such seat. I have excluded districts with no scheduled caste seats; hence, these districts will not cause the fuzziness we see in the RD. But if a constituency was not reserved for similar reasons when a district should receive more than one reserved AC, it was included.

Skipping spatially adjacent: As shown in the below figure, in the state of Andhra Pradesh, the constituency Addanki although eligible for reservation, did not receive reservation status. This decision was made because Addanki is adjacent to Santhanuthalapadu, which has the highest percentage of Scheduled Caste populations in the Prakasam district. As a result, Santhanuthalapadu was reserved, Addanki was skipped, and Yerragondapalem was reserved instead. Yerragondapalem had the second-highest percentage of Scheduled Caste populations in the Prakasam district among the unreserved constituencies, and constituency Parchur had the highest. But, Parchur was spatially adjacent to Santhanuthalapadu as well (Fig. 13).

Mapping Villages to Constituencies

The census data on village facilities do not provide the constituency a village belongs to. Thus, I required a mapping between the villages and constituencies to obtain the provision of public goods for the constituencies. Since, I compare outcomes before and after the latest redistricting too, I needed the mapping of villages to both the old and new constituencies. For this, I use data from two different sources.

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Mapping Villages to Old constituencies

I use the data submitted on the American Economic Journal website Jensenius (2015). I would like to acknowledge the source of this data. See Jensenius (2015) for details of the data. I use this data to determine if a village belonged to a different constituency before and after the redistricting or experienced a change in reservation status. I also use the data for some robustness checks.

Mapping Villages to New constituencies

To study the effect of quota on provision of public goods, I find the level of village facilities in 2011 for the new constituencies. The mapping between the villages in 2011 and the new constituencies was shared generously by Raphael Susewind. The data is protected under the Open Data Commons Open Database license. This dataset was created using proprietary data of the village location coordinates and shapefiles of the new constituencies. Some of the mappings were incorrect because the shapefiles used were not accurate enough for a large-scale analysis. The villages in this data had the village codes of Census 2001.

To verify the consistency and accurateness of the data, I use information on the administrative areas of the constituencies. The Delimitation Commission has reports of the redistricting process that specify the administrative areas of the constituencies. The administrative areas of the constituencies specified are district, blocks, sub-blocks (Revenue Inspection circles and Patwari Circles). Unfortunately, the villages that comprise a constituency are not provided. I use this information on the extent of the constituencies as a starting point for verifying and updating the data provided by Raphael Susewind. The information on the extent of the constituencies was also compiled by S Anand and shared on Datameet. But, this data did not have the census codes for most of the administrative divisions. Hence, I had to match by names of the administrative divisions.

Methodology followed for checking the accuracy of the data

The lowest level of administrative unit in the delimitation report for the extent of the constituencies was not consistent across all states. For example, some constituencies reported the extent in terms of sub-blocks, but not others. To maintain consistency I considered extent of the constituencies in terms of blocks, which was available for all states. I aggregate the data to have constituency-block pairs. This would provide the correct composition of the constituencies. Similarly, I aggregate the mapping data of villages and new constituencies to have constituency-block pairs. I match these two data sets to single out constituency-block pairs in the mapping data that do not exist in the original delimitation reports. The above process was helpful to weed out some villages that were mapped incorrectly.

Another way to spot the erroneous cases was that the wrong constituency-block pairs would have very few villages. I used this procedure to filter the correct cases from the incorrect or doubtful ones. I could not match all constituency-block pairs across these two data sets due to matching using strings. I updated the correct constituency names for the incorrect pairs manually from the delimitation papers. I was able to do so for approximately 99 percent of the villages. I also used another incomplete mapping between villages and constituencies shared by the state of Madhya Pradesh to update the constituencies for some of the villages in it.

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Public goods data at the village level for 2001 and 2011

Having established the mapping between villages of 2001 and the new constituencies, the next step was to map this to the 2011 data. The village codes are different for 2001 and 2011. To link the data I requested the directory of the census codes from the Census division of India. There were few villages that split, or, merged with other villages between 2001 and 2011. To tackle this issue I aggregate the 2011 village facilities at the 2001 census level. This results in public good variables for 2001 and 2011 corresponding to villages that existed in 2001.

C Additional Analyses

C.1 Quotas in National Elections

In this section, I explore whether there is difference in attributes of candidates for the national elections due to reservation of parliamentary constituencies. A parliamentary constituency (PC) is the relevant electoral unit for national elections. Delimitation defines boundaries of PCs and there are 543 PCs. The national elections are first past the post system; candidate with the highest vote in the PC is a Member of Parliament. The Delimitation Commission also reserves PCs for the Scheduled Castes and Scheduled Tribes using a similar algorithm as for the assembly constituencies. I use a similar strategy of establishing a discontinuous relation between the proportion of reserved population and reservation status (Figs. 14, 15)

Reservation of PCs for Scheduled Castes includes similar exceptions as reservation of assembly constituencies for Scheduled Castes, such as maintaining heterogeneity in the geographic distribution of SC constituencies. As shown in the figure below, the probability of reservation for SC increases by approximately 50 percentage points on crossing the threshold. Since, the number of PCs is much smaller compared to assembly constituencies, there is a higher proportion of PCs affected due to the exception for SC reservation (Tables 9, 10).

There are no exceptions to reservation of PCs for Scheduled Tribes. As shown in the figure below, a PC is reserved with a probability of one on crossing the population cutoff for Scheduled Tribes.

For PCs too, these imply a fuzzy and sharp regression discontinuity design. But, the sample size is insufficient to find non-parametric second-stage RD estimates. Instead, I use two-stage least-squares method with a specification similar to that of fuzzy RD design and obtain parametric estimates. I restrict the sample to a bandwidth of ten percentage points. I use affidavits of candidates for national elections after the latest redistricting, that is in 2009 and 2014. The table below presents the results for the effect of reservation of a PC on attributes of candidates. Candidates from SC reserved constituencies have lower criminal charges and total assets. The result is same on controlling for incumbents. The estimates for total assets are negative but insignificant due to high standard errors.

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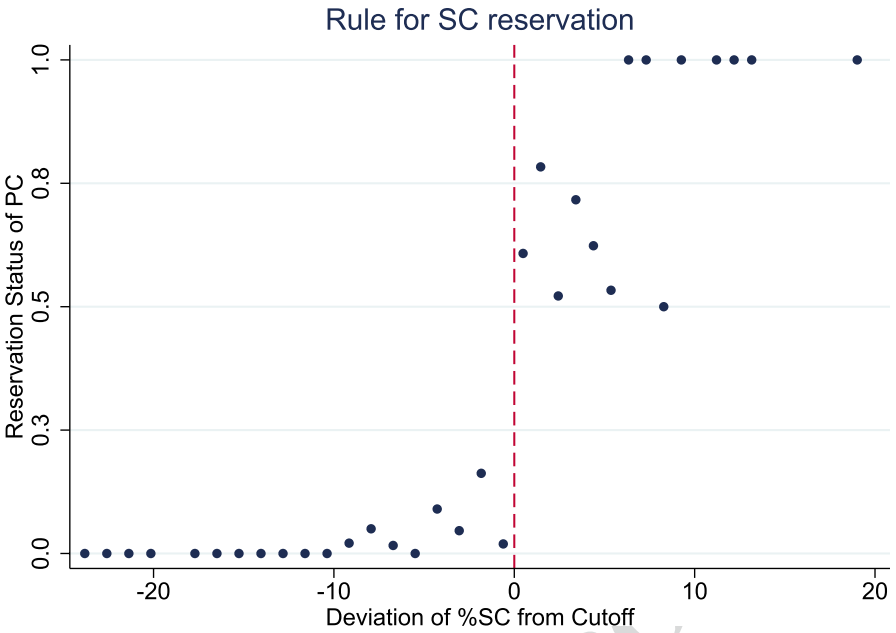

Fig. 14 Reservation of parliamentary constituencies for SCs. The percentage population of scheduled castes corresponding to the last PC reserved acts as the cutoff for this figure. The running variable is normalized to have the cutoff as zero. All other points are differences of the percentage population from the cutoff

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Table 9 Reservation of PCs

	(1)
Variables	Reserved for SC
RD estimate	0.522***
	(0.105)
Observations	2521
BW	CCT
Control	% of SC Population

The number of observations is equal to the number of candidates within a bandwidth of 5.3 percentage points around the cutoff of zero. The estimates remain similar for different bandwidths. Percentage of Scheduled Castes in the PC has been used as control

Standard errors in parentheses

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

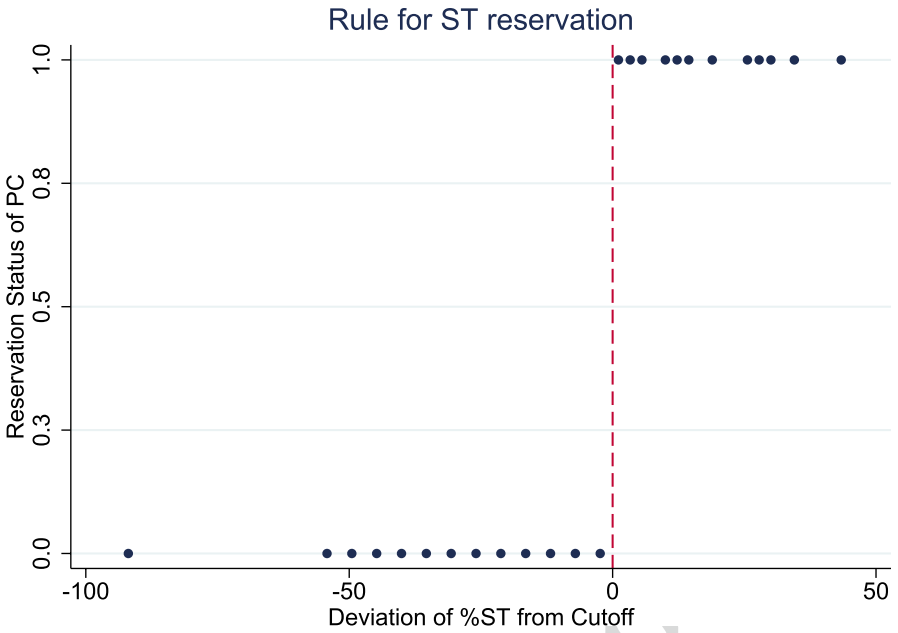

Fig. 15 Reservation of parliamentary constituencies for ST. The cutoff is normalized to zero and thus all other points are differences of the percentage population from the cutoff

Table 10 Effect on SC reservation on attributes of candidates

Variables	(1) Has a criminal charge	(2) Total assets	(3) No.of criminal cases
Reserved for SC	−0.119***	−7.299	−0.363**
	(0.0389)	(4.720)	(0.152)
Constant	0.127***	33.45***	0.270
	(0.0400)	(5.198)	(0.170)
Observations	5611	5548	5610
R-squared	0.036	0.105	0.023
Control	Y	Y	Y

The number of observations imply the number of candidates within a bandwidth of ten percentage points, cutoff normalized to zero. The nature of the estimates remain similar for different bandwidths. The regressions control for percentage of Scheduled Castes and include state fixed effects

Robust standard errors in parentheses

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

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C.2 Growth in Village Facilities

The new constituencies formed have different composition of villages than those in 2001. I calculate the level of public goods for the new constituencies in 2001 with their current composition of villages. This provides a hypothetical estimate of what would have been the level of public goods in these constituencies if they had existed in their current form in 2001. I only consider variables that were present in both the Censuses, and aggregate the variables in a way to make them comparable. This is an approximation because some of the villages that are now mapped to the new constituencies experienced a different administration in 2001.

The figure below shows that while there has been an increase in facilities in the 2001-2011 period, the reserved constituencies have not gained differentially compared to the unreserved. In an ideal scenario the analysis would be to compare constituencies that were hundred percent similar, in terms of composition of villages and reservation status. However, for constituencies that did not face a huge change in their composition of villages (that is, they did not experience a major change in their boundaries) or a change in reservation status, this should be a reasonable method of approximation (Fig. 16).

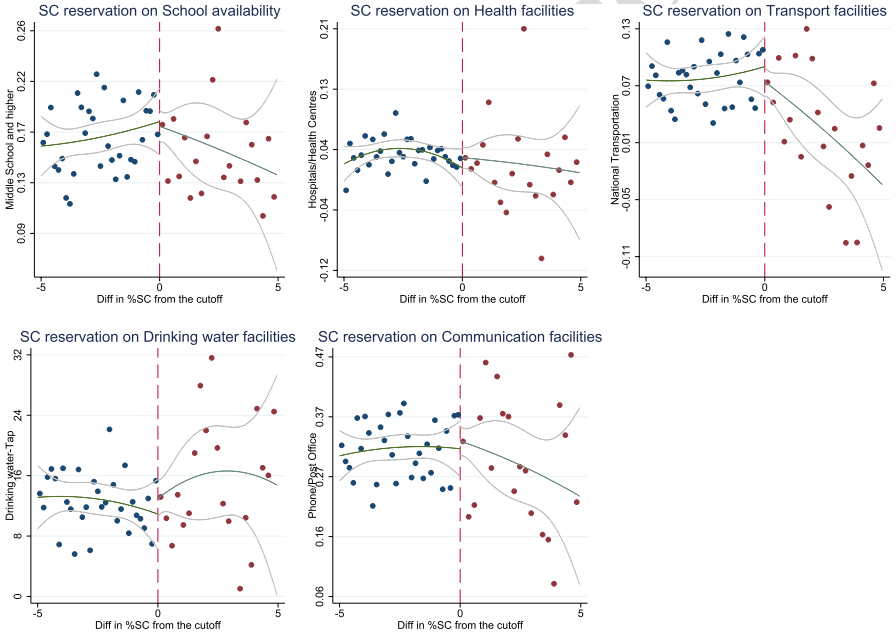

Fig. 16 Effect of SC reservation on growth of village facilities. The outcome variables represent the growth in the level of village facilities from 2001 to 2011. The variables have been restricted to those that could be found in both the Censuses. There has been a positive increase in all the facilities, but the SC constituencies seem to be falling behind in case of transportation facilities.

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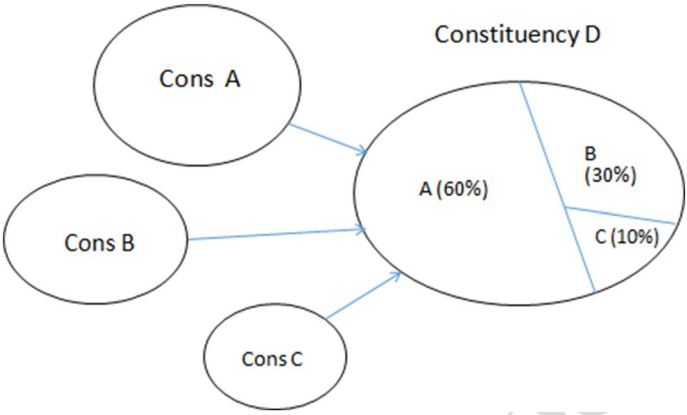
To understand size of the change in the boundaries before and after the delimitation, I overlay geocoded maps of the old constituencies on the new constituencies and find the overlap percentage using the software ArcGIS. For every new constituency, I find the old constituency with the largest area in the new constituency. The diagram below illustrates this:



The new constituency D comprises of 60 percent of the old constituency A, 30 percent of B, and 10 percent of C. The old constituency approximately similar to new constituency D is A. In case of a 100 percent overlap, this would imply that the old and new constituencies are the same. Else, I find the constituency that is most similar to the new constituency. Despite significant boundary changes for many constituencies, the median overlap percentage between the old and new constituencies is 60 percent.

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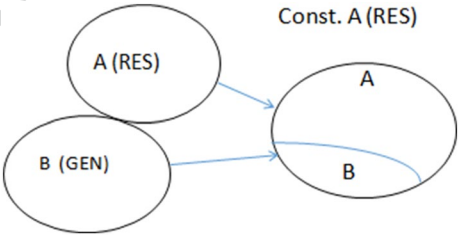
C.3 Village Level Analysis

The strategy can be better understood using the following picture:



Let us assume the old constituencies A and B form the new constituency A. A was a reserved constituency both before and after the redistricting, whereas B was not. The villages in B that now belong to A, faced a change in constituency as well

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as a change in reservation status (of the constituencies they belong to). To identify villages that experienced the change, I need to know the villages that belonged to the old and new constituencies. I acquire the mapping between the villages and the old constituencies from the data used in Jensenius (2015). Raphael Susewind shared the mapping of villages with the new constituencies and I update the data wherever required. I combine both datasets and construct dummy variables for: whether a village experienced a change in constituency, and whether the village experienced a change in reservation status.

Thus, based on whether a village experienced a change in boundary or reservation status, all the villages can be classified as shown in the following table.

	Reservation status change		
Boundary change	Gained reservation	Lost reservation	No Changers
Yes			
No			

The reservation status of a village could change because it switched constituencies, or because the reservation status of the constituency it belonged to changed.[35] I estimate the change in the level of public goods in a village because of the change in reservation status of the constituency using the following specification:

$$\Delta Y_i = \alpha + \beta_1 SW_i + \beta_2 BC_i + \beta_3 SW_i * BC_i + \Delta Pop_r + \lambda_c + \varepsilon_i \quad (4)$$

$$SW_i = \begin{cases} 1 \text{ if General to Reserved} \\ 0 \text{ if General to General} \end{cases} \quad (5)$$

where ΔY_i is the change in the level of village facilities from 2001 to 2011, SW_i=1 implies village i is reserved after the redistricting and earlier was not, BC_i indicates if the village changed constituencies.[36] The coefficient of interest is β_3 for the interaction term $SW_i * BC_i$ which captures the effect of the change in reservation status from general to reserved for villages that changed constituencies. ΔPop_r is the growth in the reserved population comprising of Scheduled Castes and Scheduled Tribes in the village from 2001 to 2011. The specification includes the old constituency fixed effect denoted by λ_c and the errors are clustered at the constituency level.

Result from the above regression is presented in the table below and the estimates obtained are insignificant and negative. The coefficients imply that on gaining

[35] I use the initial sample of 2,801 constituencies and the 401,431 villages that comprised them. There were 14,410 villages for which the sample did not have the old reservation status and 2,166 observations for which it was unclear if the villages changed constituencies. This leads to a final sample of 384,855 villages used in this analysis.

[36] This implies that the control group in this case are villages which were unreserved before and after the redistricting. I also estimate a specification using all villages that did not change reservation status including those that were reserved both before and after the redistricting as control group. The results do not change significantly.

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Table 11 Effect on individual villages

variables	(1) Middle school or higher	(2) Tap	(3) Phone/Post Office	(4) Hospitals/ Health Centers	(5) Transport
Interact	−0.0156	−0.0151	−0.0178	0.00375	−0.00685
	(0.0123)	(0.0225)	(0.0221)	(0.0145)	(0.0137)
GEN to reserved	0.00676	0.0198	0.000884	0.00271	0.00307
	(0.0115)	(0.0178)	(0.0186)	(0.0104)	(0.0106)
Boundary change	0.00410	−0.0156*	0.00290	0.000725	−0.00816*
	(0.00393)	(0.00804)	(0.00824)	(0.00478)	(0.00470)
Constant	0.129***	0.178***	0.371***	0.0130	0.0498
	(0.0242)	(0.0455)	(0.0601)	(0.0261)	(0.0418)
Observations	348,862	347,207	347,200	342,502	346,297
R-squared	0.017	0.048	0.033	0.022	0.014
Control	Y	Y	Y	Y	Y
Fixed effects	Y	Y	Y	Y	Y

All the specifications include constituency level fixed effects and the growth in reserved population as control. The standard errors have been clustered at the constituency level. The estimates of interest are presented in the first row of the table

Robust standard errors in parentheses

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

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a reservation status, percentage of villages that have a middle school or higher decreases by 1.6 percentage points. Incorporating the confidence interval, this implies any negative effect of greater than 2.8 percentage points can be ruled out. This is not very different from the estimates obtained from the regression discontinuity estimation for constituencies (Table 11). [37]

There are two possible concerns with the above analysis. Firstly, the outcomes measured are public infrastructure, they may require more time to be built or for the change in the numbers to be reflected in the data. Second, as mentioned earlier, the boundaries were effective after 2007, hence, there were few years between the state elections and the 2011 Census. The Village Census is the most comprehensive dataset for villages in India, but in future it would also be interesting to use the above setup and another suitable dataset from a recent period as a measure of public goods. I had explored various options, but was unable to find something suitable during the time period of this project.

C.4 District Level Analysis

An analysis of the effect of reservation of assembly constituencies on a district may help to account for any spillovers between constituencies and internalize any friction

[37] I also validate results by considering SC and ST reservation separately, the results do not change significantly.

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due to change in boundary of the constituencies. The assembly constituencies are never split between districts and contained in one district. The below figure presents the map of districts in India and assembly constituencies in a sample district:

The question now relevant is slightly different, what is the effect of an increase in the number of reserved constituencies in a district. I use two methods to analyze this question. Figure 2 shows that the number of constituencies reserved for Scheduled Castes in a district will change depending on if the predicted number of constituencies is greater than the 0.5 thresholds (that is 0.5, 1.5, 2.5 and so on). I stack all the thresholds and normalize them to be zero such that observations with predicted number of seats between zero to 0.5 are on the left of the cutoff Figs. (17, 18) (Table 11).

This leads to a RD setup as shown in the above figure, where the number of SC seats or constituencies is a discontinuous function of the predicted number of SC seats. The first stage estimation for the relation is presented in the table below:

But, due to a small sample size, it is challenging to obtain precise estimates for a given bandwidth. The RD plots for the second stage does not show any significant effect.

For the district level, I also explore another variation. Due to the latest redistricting, there was a change in the number of assembly constituencies in a district and also a change in the number of reserved assembly constituencies. So, some districts gained or lost the number of reserved assembly constituencies. I construct a panel setup and estimate it using the following specifications:

$$Y_{it} = \alpha + \alpha_1 SCG_i + \alpha_3 \text{Post}_i + \alpha_4 \text{Post}_i * SCG_i + \varepsilon_i \quad (6)$$

where SCG_i: increase in number of SC seats in district i and $Post_i$=1 for 2011

Another alternative specification would be as follows:

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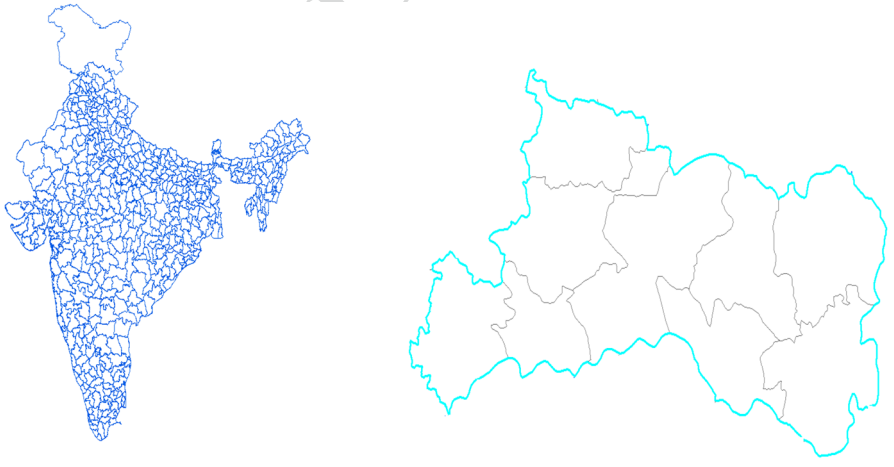

(a) Districts (b) ACs in a District

Fig. 17 Districts and Assembly Constituencies in India

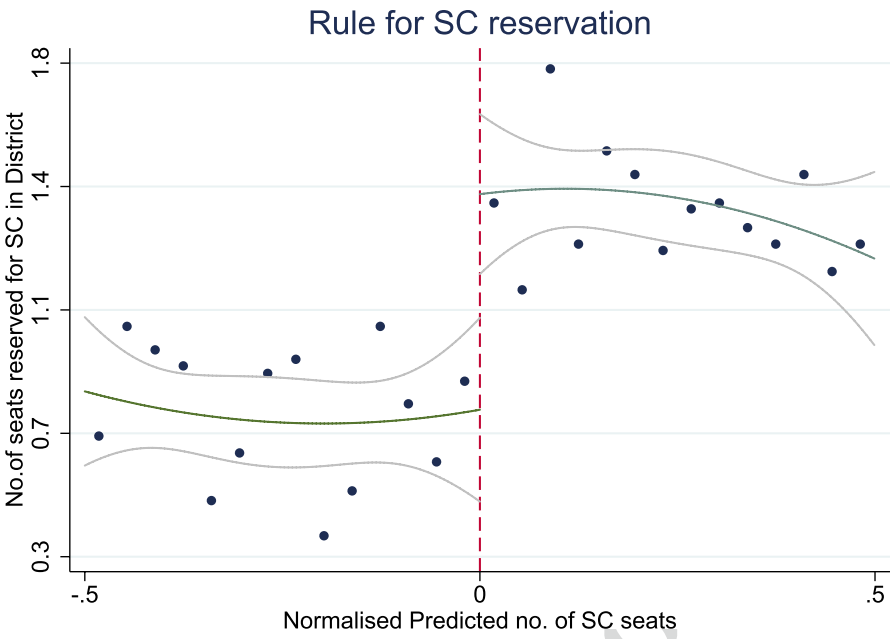

Fig. 18 Allocation of SC constituenciss to districts

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Table 12 First stage estimates

Variables	(1)	(2)
	#SC seats	#SC seats
RD estimate	0.426**	0.480***
	(0.204)	(0.178)
Observations	452	452
Band Width	.17	.35

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

The table shows that the probability of getting one more SC seat increases by 0.43 for a district on crossing the cutoff. The optimal bandwidth is estimated using the CCT procedure and is 0.17

$$Y_{it} = \alpha + \alpha_1 SCG_i + \alpha_2 SCL_i + \alpha_3 \text{Post}_i + \alpha_4 \text{Post}_i * SCG_i + \alpha_5 \text{Post}_i * SCL_i + \varepsilon_i \quad (7)$$

where SCG_i: increase in number of SC seats in district i, SCL_i: decrease in number of SC seats in district i, and $Post_i$=1 for 2011

The results remain insignificant and do not differ significantly in either of the specifications.

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D Other Notes

1. At the state level, for majority of the states, the legislatures are composed of the Governor and only one house called the legislative assembly or Vidhan Sabha. The states of Bihar, Jammu and Kashmir, Karnataka, Maharashtra, and Uttar Pradesh have an additional house called the legislative council or Vidhan Parishad, similar to the Rajya Sabha at the national level. Andhra Pradesh and the newly formed state Telangana have been on the legislative council since 2007 and 2014. Among the union territories, only Delhi and Pondicherry have legislative assemblies, thus other union territories are excluded from my analysis.
2. State legislators are also responsible for appointing members of the upper house of Parliament of India called Rajya Sabha along with the President of India. (Source: rajyasabha.nic.in)
3. To give an idea about how assembly constituencies overlap with the administrative divisions, there are 35 states and union territories, 593 districts, 5,143 blocks in India according to Census 2001, and 4,120 assembly constituencies.
4. The Representation of People's Act, 1951 bars convicted citizens from contesting elections, but there is no law against candidates with criminal charges. The Act of 1951 has some criticisms as there might be bias in prosecuting the elites or the powerful with charges against them to prevent or delay conviction making them eligible to stand for elections. An amendment to this Act has been proposed, but has not been implemented yet (Dutta 2015).

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