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## Do electoral quotas ‘work’ after they are withdrawn? Evidence from a natural experiment in India

Rikhil R. Bhavnani\*

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### Abstract

Do electoral quotas for women alter women’s chances of winning elections after they are withdrawn? I answer this question by examining an unusual natural experiment in India in which randomly chosen seats in local legislatures are set aside for women for one election at a time. Using data from Mumbai, I find that the probability of a woman winning office conditional on the constituency being reserved for women in the previous election is approximately five times the probability of a woman winning office if the constituency was not reserved for women previously. I also explore tentative evidence on the mechanisms by which reservations affect women’s ability to win elections. The data suggest that reservations work in part by introducing into politics women who are able to win elections after reservations are withdrawn and by allowing parties to "learn" that women can win elections.

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\*PhD Candidate, Department of Political Science, Encina Hall West, Room 100, Stanford University, Stanford, CA 94305 (rbhavnani@stanford.edu). Many thanks to David Laitin and Jeremy Weinstein for guidance through the course of this project. Thanks also to Steve Haber for initial discussions, to Jonathan Wand, Jim Fearon, Alberto Diaz-Cayeros, Miriam Golden, Beatriz Magaloni, Irfan Nooruddin, Christina Xydias, Natan Sachs, Leonardo Arriola, participants at the Stanford Comparative Politics Workshop and the MPSA 2008 Annual Conference, three anonymous reviewers and the editorial board of the *Review* for comments on previous versions of this paper. I also thank Steve Wilkinson for discussions. I am particularly grateful to Trivik Bhavnani for help with fieldwork and for organizing and supervising the data entry and coding process, Mrs. Kudva (Liaison Officer, BMC Election Office) for giving me access to the data, and Vilas and Ulhas Kamathe for entering the data.

Electoral quotas, which are used in over 100 countries across the world, increase the representation of target groups in legislatures. But do the beneficial effects of quotas persist after they are withdrawn? Answering this question is important since quotas are often thought of as temporary measures, used to improve the lot of particular groups of people until they can take care of themselves. Target groups could secure representation for themselves after quotas lapse as the constraints that previously prevented their effective political voice are mitigated, either by broad social processes or by quotas themselves. A thorough accounting of the costs and benefits of quotas therefore must investigate whether quotas themselves can continue to boost the representation of target groups in legislatures after they are withdrawn. This question is particularly important since quotas restrict the opportunities available to non-target groups, and might, in fact, cause a backlash against beneficiaries (Weiner 1978; Wilkinson 2000).

Little evaluation of the lasting effects of quotas has been conducted for at least two reasons. First, despite intentions to the contrary, quotas are rarely withdrawn.<sup>1</sup> This makes it difficult to assess what would happen to target groups once quotas have been eliminated. Second, since incumbent politicians have the incentive to implement quotas in areas where target groups would do well anyway, simple comparisons of seats with and without quotas would probably yield biased estimates of the effects of quotas.

I circumvent these problems by examining the results of a unique policy initiative in India that sets aside randomly chosen seats in local governments for women for one election at a time. I use this natural experiment to ask what the effect of "reservations" on the chances of women winning elections after quotas have lapsed is. Using data for Mumbai, I find that the chances of a woman winning office conditional on the constituency being reserved for women previously are approximately five times the chances of a woman winning office if the

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<sup>1</sup>The Indian constitution, for example, originally mandated that seats be set aside in India's national and state legislatures for "scheduled castes" and "scheduled tribes" (so called because these peoples are listed in a schedule or annex to the constitution of India) for ten years, until 1960. The constitution has been repeatedly amended, however, to delay the withdrawal of quotas, which are still in force today. Similarly, although affirmative action programs in the United States were conceived as temporary measures, many of these have been in effect continuously since the 1960s.

constituency was not previously reserved for women. I also explore suggestive evidence on the mechanisms by which reservations might improve women’s ability to win elections. I find that reservations mainly work through introducing into politics a cohort of women that are able to secure party tickets and win office after reservations lapse. This finding speaks to the external validity of my results, and also suggests that the degree to which the beneficial effects of reservations persist will depend on the extent to which the cohort of women that enter politics while reservations are in effect continue to run for office after reservations lapse. Furthermore, since quotas have continuing positive effects on women’s representation after they are withdrawn, the costs of this remedy for inequalities in political representation—in terms of preventing men from running for office—need only be temporary. This finding should provide succor to those that deplore the reverse discrimination (against men, in this case) that permanent quotas institute.

I proceed as follows. I explore the related literature in section 1, and introduce the context in which I explore the next-election effects of reservations in section 2. I describe the data and empirical strategy in section 3, and present my findings on the next-election effects of reservations in section 4. I explore the channels through which reservations might improve women’s chances of winning elections in section 5, and conclude in section 6.

## **1. Literature review**

This paper contributes to the substantial literature on remedies for inequalities in political representation. Although a large portion of this literature has devoted itself to developing rationales for various remedies for inequalities in political representation (see Mansbridge 2005 for a robust defense of quotas for women, for example), and to explaining the mechanisms by which some of these remedies, such as gender quotas, have come to be used world-over (Krook 2006), there is also a substantial literature on the effects of various remedies for inequalities in political representation. The literature on majority-minority districting, for example, examines the partisan and policy effects of such districting strategies (Cameron,

Epstein and O'Halloran 1996; Shotts 2003; Lublin and Voss 2003), while the literature on quotas examines their effects on the provision of public goods (Chattopadhyay and Duflo 2003, 2004), attitudes towards female politicians (Beaman et al. 2008), the targeting of social expenditures and transfers (Bardhan, Mookherjee and Torrado 2005; Pande 2003), candidate quality (Ban and Rao 2008) and several other outcomes (Ghatak and Ghatak 2002; Jha and Mathur 1999; Singh, S. 2003). While much of this literature examines the effects of remedies for inequalities in political representation while they are in place (while, for example, quotas are in force, or while districts are gerrymandered), I depart from this literature to investigate the effect of quotas for women after quotas are withdrawn.

Insofar as I examine the mechanisms by which quotas affect the odds of women securing political office, this paper relates to an even broader literature that aims to understand the causes of the underrepresentation of various peoples in politics. This literature includes works on the determinants of people's decisions to run for office (Fox and Lawless 2004; Chhibber 2002), the literature on party (Sanbonmatsu 2006) and voter perceptions (Barry, Honour and Palnitkar 2004; Beaman et al 2008; Hajnal 2001) of minority candidates, and the literature on changing social norms (Mackie 1996). This paper contributes to this literature by examining the effects of an exogenous and random shock (the quota) on the election process. By examining the behavior of relevant actors in wards with and without quotas, I am able to improve our understanding of the constraints that women face in being elected.

In terms of methodology, this paper analyzes an atypical natural experiment, where those in the treatment group were chosen through an explicit lottery rather than through an intervention that was "as-if" random. In so doing, the paper joins a spate of recent works by economists that have examined the effects of such lotteries—oftentimes employed by governments to ensure apolitical selection of beneficiaries, rather than to facilitate policy evaluation—on various outcomes (Clingingsmith, Khwaja and Kremer 2009; McKenzie, Gibson and Stillman 2006).

Lastly, this paper will address a weakness of the literature on institutions. This litera-

ture highlights the effects of exogenous factors—such as colonialism, diseases and wars—on institutions and, in turn, their effect on politics and economics. While this research agenda helps identify important effects, it provides little room for human agency and policy advice: we cannot recommend that states acquire colonial subjugators or new geographies, or that they engage in wars. I therefore focus on trying to specify the effect of a deliberate policy (reservations) on a social institution (discrimination).<sup>2</sup>

## 2. Context

Inspired by India’s pre-colonial history of local self-government and Mahatma Gandhi’s vision of an India made up of self-sustaining “village republics,” the Indian constitution of 1950 directed the state to work towards the establishment of vibrant local governments. Most of these governments—particularly at the village, block and district levels—existed on paper since the 1950s, constituted without elections and bereft of substantial powers. The 73<sup>rd</sup> and 74<sup>th</sup> constitutional amendments, passed in 1992, directed India’s state governments to conduct elections at local levels, devolved powers of expenditure and oversight to these bodies, and mandated the reservation of one-third of the seats in these local bodies for women.<sup>3,4</sup> Since only female candidates can run for election in wards reserved for women, only women are elected from these seats.

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<sup>2</sup>The norm of discrimination against women in India is an institution in the sense that it is a commonly known “rule of the game” that guides people’s behavior.

<sup>3</sup>These amendments also reserve seats for members of the scheduled castes and tribes. I restrict my analysis to the effect of reservations for women, however, because data on castes of voters and candidates in non-reserved seats are unavailable, because the fact that caste identification can be fluid makes it difficult to isolate the impact of caste-based reservations on the political process, and because seats reserved on the basis of caste are chosen on a non-random basis.

<sup>4</sup>A natural question that arises is why the overwhelmingly male political class, which stood to lose its near-monopoly on representation, agreed to reservations for women in the first place? The answer might partly lie with the strength of the women’s movement in India (Barry, Honour and Palnitkar 2004), although this is disputed (Sen 2000, for example, argues that the women’s movement had little to do with the introduction of quotas), and can also probably (I’d hypothesize) be traced to the fact that seats were to be reserved for women in local—rather than in state or national—legislatures. Since most of these bodies were moribund until the early-1990s, politicians probably did not perceive reservations for women to be a threat to their future job security (whether this has proved to be the case is an interesting, researchable question). This explanation is consistent with the fact that although reservations for women in local bodies were mandated in 1992, a bill mandating reservations for women in state and national level legislatures has been repeatedly scuttled for want of political support.

A silent revolution in local governance has followed. Two to four elections have been held for more than an estimated two million seats in over 220,000 local government bodies across the country since 1992.<sup>5</sup> Women's representation, which had ranged between 3 and 9 percent of house strength in India's state and national legislatures, now stands at over a third of seats in local bodies.

Seats reserved for women are randomly chosen and change from election to election. This ensures that the process is fair, to the extent that every seat has an equal chance of being "reserved," and that men in reserved constituencies are not permanently excluded from office.

I consider the impact of reservations for women on local politics in Mumbai. Mumbai is located on India's west coast, in the state of Maharashtra. With a population of approximately 13 million, it is India's largest city and one of the largest in the world. Its municipal corporation was established in 1888, and elections for its "corporators" or members have been conducted—on a first-past-the-post basis, for single member districts—more or less every five years since. Through its executive wing, the Brihanmumbai (Greater Mumbai) Municipal Corporation (BMC) is responsible for the provision of most of the city's essential services, including roads, water, sanitation, education and health. It raises approximately \$2.5 billion in revenues every year for these purposes, which makes it the largest local government in India. As in the case of many local governments in India, however, the deliberative wing of the BMC is weak.

I trace the impact of reservations in 1997 on electoral outcomes in 2002. While one-third of the seats in the city's municipal corporation were reserved for women in 1997 and 2002 per the constitutional amendments described above, the city's experience with reservations started earlier, in 1992, when 30 percent of the seats were reserved for women under a state election law that was subsequently superseded by the national constitutional amendments. My analysis, however, will be restricted to a comparison of 1997 and 2002 election results

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<sup>5</sup>The number of elections held for local bodies varies across India as different regions follow different election schedules.

for reasons that I detail in the next section.

Local elections in India are an appropriate choice to study whether reservations have a sustained impact on the ability of women to win office due to the confluence of two unique factors. First, although quotas are rarely withdrawn once they are introduced, the fact that seats reserved for women in India change in each election means that quotas are, in fact, withdrawn in some instances. Second, since seats are reserved for women through a randomized process, comparisons of wards that were reserved and not reserved do not suffer from selection effects that would be endemic to such comparisons in other contexts.

While an identical analysis could, in principle, be conducted using data from other regions in India, the places that we could examine are surprisingly limited, for three reasons. First, few local election authorities maintain detailed historical election data. I managed to retrieve detailed 1997 and 2002 election data for Mumbai from the BMC after much effort. Second, the analysis would probably have to be limited to city elections since conducting such an analysis for rural areas would involve the examination of too large a geographic area (encompassing many small villages, since each village has few legislators) for comparisons to be meaningful. Third, the electoral systems in many Indian cities have changed multiple times in the past two decades, rendering comparisons between electoral outcomes over time difficult. Mumbai therefore offers us an unusual opportunity to identify the effects of randomized quotas.

### **3. Data and empirical strategy**

In order to test whether reservations for women affected the probability of women winning subsequent elections, I collected data from the Maharashtra State Election Commission and BMC. The data collected were, in a mix of Marathi and English and for the 1997 and 2002 elections, official “result sheets” for each of Mumbai’s electoral wards, Maharashtra gazette notifications of ward boundaries, the reservation status for various seats and candidate lists, and internal documents of the Election Office of the BMC. For each ward, I coded

the names, sex, party, incumbency status and vote tallies for every candidate in the 1997 and 2002 elections. This yielded 2,725 and 2,065 records for the 1997 and 2002 elections, respectively. I also coded, for each ward, the reservation status and the total number of eligible voters: this yielded 221 records for the 1997 elections, and 227 records for the 2002 elections.

The empirical strategy of this paper is straightforward since seats reserved for women were randomly chosen. More specifically, the reservation process proceeded as follows. First, constituencies (also called seats or wards) with the highest concentration of Scheduled Castes (SCs), Scheduled Tribes (STs) and Other Backward Classes (OBCs) were reserved for SCs, STs and OBCs, respectively.<sup>6</sup> The proportion of seats reserved for these groups was set equal to the proportion of these groups in the city’s population. Second, within the four groups created by the previous step (the fourth group contained seats that were open to all regardless of caste or class), 33 percent of the seats were randomly reserved for women—independently, and with equal probability—in 1997 and 2002. Table 1 summarizes the reservation status for all the BMC wards in the three elections. It shows that the result of this process was that 33 percent of the wards were reserved for women through randomized, stratified and independent draws in 1997 and 2002.

That such randomization really did occur is evidenced by the fact that reserved and unreserved wards in 2002 were statistically indistinguishable from one another in terms of a number of 1997 election-related characteristics, including their reservation status in 1997, their track record of electing women to office and their party affiliation (see Appendix Table 1 for details). I could not conduct such an analysis to verify that the 1997 reservations were orthogonal to 1992 election characteristics due to changed ward boundaries between the elections. However, similar tests comparing the socio-economic characteristics of reserved and unreserved wards across a number of different locales and election years in India have shown that reserved and unreserved wards are statistically indistinguishable from one another

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<sup>6</sup>While people are defined as being OBC if they meet certain caste, education and income criteria, in practice and for elections, only the caste criterion is used to determine whether a candidate is an OBC.



(Chattopadhyay and Duflo 2003; Pande 2003).

Further, qualitative evidence for the probity of the randomization process comes from the fact that the 2002 BMC elections saw the reservation of the seats of the sitting male Mayor and Deputy Mayor, and 18 other male BMC incumbents (Naik and Lokhande 2001). The reservation of their seats, and the norm that representatives be resident of the ward from which they are running for office, meant that these politicians were barred from running for local political office in 2002, which is an outcome that we may safely assume they would have prevented if they could have. Given their inability to do so, we may assume that the reservations process was not tampered with.<sup>7</sup>

While the contemporaneous, within-election effects of reservations on political outcomes can be estimated by comparing reserved and open wards in 1997 and 2002, the challenge lies in devising a way to estimate the next-election effects of reservations. In order to do this, I restrict my analysis to wards in 2002 that were not reserved or "open," and compare those that were reserved in 1997 (the treatment wards,  $n=37$ ) with those that were not reserved in 1997 (control wards,  $n=81$ ). In comparing these wards, I use difference in proportions tests for dichotomous data, and difference of means tests ( $t$ -tests) for continuous data.

In order to make the experimental set up clearer, consider the "transition matrix" in Figure 1, which notes the reservation status of reserved and unreserved wards in 1997 and 2002. The matrix shows that there were 81 wards that were randomly declared "open" in 1997 and 2002 (the control group), and 37 wards that were randomly reserved for women in 1997 and were open in 2002 (the treatment group). Comparing these wards allows me to test my central question—whether the 1997 reservations increased the probability that

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<sup>7</sup>Further, the electoral redistricting process was conducted just before the 1997 elections and substantially changed electoral boundaries. This will have made any strategic tampering of the reservations process difficult.

women win elections in 2002.<sup>8,9</sup>

Randomization addresses the concern of controlling for heterogeneity in the baseline characteristics of treatment and control groups by ensuring that assignment to the reserved wards group is orthogonal to ward characteristics that might dispose wards to elect women. If reservations were not randomized, political parties would have the incentive to run female candidates in wards that would have elected women in the absence of reservations, in which case the estimated effect of reservations on women's chances of winning subsequent elections would be attenuated. The randomization of reservations addresses such concerns.

I do not incorporate the results from the 1992 or the 2007 BMC elections in my analysis since electoral wards from these years are not comparable to wards from other years. That this is the case is not surprising since the ward boundaries were substantially revised in 1997 and in 2007 in order to take into account the new population figures from the 1991 and 2001 censuses, respectively.<sup>10</sup> I also do not use the 1992 data because the secondary literature (Sankaran 1992) and my discussions with BMC officials suggest that the reservations process was not random in 1992.<sup>11</sup> I employ data from 1997 and 2002 for my analysis instead since

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<sup>8</sup>As Figure 1 indicates, I restrict my attention to the 173 of 221 (78 percent) of wards whose boundaries remained largely unchanged between 1997 and 2002. A slight redrawing of boundaries was conducted just before the 2002 elections for reapportionment purposes, by bureaucrats, without political interference, and only took into account differences in the draft and final 1991 census results. By restricting our attention to wards whose boundaries remained unchanged between elections, I am assuming that these wards are representative of all wards. That this is a reasonable assumption is supported by the fact that the mean election-related characteristics of the wards whose boundaries remained the same and those that changed are statistically indistinguishable from one another (results available upon request).

<sup>9</sup>That the reserved wards were independently chosen in 1997 and 2002 is reflected in the size of the treatment and control groups. Note that if reservations are perfectly random, we would expect that treatment wards to number  $\Pr(\text{a ward is reserved for women in 1997}) * \Pr(\text{a ward is not reserved for women in 2002}) * \text{number of wards that have nearly identical boundaries in 1997 and 2002} = \frac{1}{3} * \frac{2}{3} * 173 \approx 38$  (as compared with the actual 37 treatment wards). Similarly, we would expect the control wards to number  $\Pr(\text{a ward is not reserved for women in 1997}) * \Pr(\text{a ward is not reserved for women in 2002}) * \text{number of wards that have nearly identical boundaries in 1997 and 2002} = \frac{2}{3} * \frac{2}{3} * 173 \approx 77$  (as compared with the actual 81 control wards). I am also unable to reject the hypothesis that the reservations processes in 1997 and 2002 were independent using a chi-squared test.

<sup>10</sup>The 1992 ward boundaries differed substantially from wards in subsequent years also because the size of the BMC's legislative wing was increased from 170 corporators in 1992 to 221 corporators in 1997.

<sup>11</sup>Specifically, Sankaran (1992) suggests that the seats reserved were ones where women were "in a majority" (189). I was unable to verify that this was the assignment rule for reservation status from another source, however. In discussions, BMC officials suggested that the reservations process in 1992 followed a complicated, non-random formula, the specifics of which were not known to them at the time.

ward boundaries in these years were comparable to one another, and because seats were randomly chosen to be reserved in these years.

While the randomized manner in which quotas were implemented maximizes the internal validity of my analysis, the results should be externally valid as well. My investigation of the mechanisms through which reservations might boost women’s chances of winning office in subsequent elections (in section 5, below) hints at the conditions under which the effects of reservations are likely to persist and to hold elsewhere. I discuss these conditions in the concluding section of the paper.

To confirm that reservations were indeed implemented in practice, consider Table 2, which shows the contemporaneous, within-election effects of reservations in 1997 and 2002. The first row of the table indicates that reservations had their primary intended effects: women became corporators in all the seats set aside for them. In comparison, women won 3.4 and 8.6 percent of the open seats in the 1997 and 2002 elections, respectively.<sup>12</sup> The difference in average outcomes between the reserved and open wards is statistically significant at the 1 percent level using a one-sided difference of proportions test. This is not surprising given that only women were eligible to run for office in reserved wards. Similarly, and consistent with the previous result, the number and percentage of female candidates in reserved seats (rows 3 and 5), and the total and average percentage of votes received by female candidates (rows 6 and 7), are higher to statistically significant degrees (using one-sided difference of means tests) in reserved than in open seats. Although reserved constituencies are also somewhat less competitive than open constituencies (rows 4 and 9), they are still competitive.

These results suggest why we might expect reservations to have effects on subsequent elections. The elections in reserved seats were real, rather than sham, elections. For the first time, because of reservations and in wards with reservations, a stream of viable female candidates entered politics, the city’s leading parties nominated female candidates, voters came

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<sup>12</sup>Since compliance with the reservation policy is perfect, the calculated effects of the treatment are—unusually for an experimental study—average treatment effects, and are not the more usual intention-to-treat effects.

out in substantial numbers to vote for women, and seats were won by women. Reservations were perfectly implemented in the sense that only women were allowed to run for office in reserved seats, and women were elected in all seats reserved for them. Moreover, that the percentage of open in seats in which women won elections increased from 3.4 percent in 1997 to 8.6 percent in 2002 (this increase is statistically greater than zero at the five percent level) indicates the possible next-election impacts of the 1997 reservations, which is what the rest of my paper analyzes.<sup>13</sup>

#### 4. The next-election effects of reservations

Table 3 details the result of the natural experiment central to this paper. It tests for the continuing effects of the 1997 reservations on various aspects of the 2002 elections. The first row reveals the main result of this paper: while approximately 21.6 percent of wards that were reserved for women in 1997 but were open in 2002 (treatment wards) were won by women, only 3.7 percent of wards that were open in 1997 and 2002 (control wards) were won by women. Women's chances of winning ward elections are therefore more than quintupled by the 1997 reservations. The increase in the chances of a woman winning an election is statistically significant at the one percent level.<sup>14</sup>

A number of other indicators are consistent with this result. As row 2 of Table 3 indicates, the percentage of treatment wards where at least one woman ran for office (73.0), for example, is double the percentage of control wards where at least one woman ran for office (35.8). The average number (row 3) and percentage of female candidates (row 5) that ran for office in treatment wards is also double the figure in control wards. Remarkably, while female candidates were competitive in 43 percent of treatment wards, they were competitive

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<sup>13</sup>While a naive estimate of the effects of the 1997 reservations might be the difference between these two figures, this estimate is biased upwards to the extent that women have been gradually increasing their participation in local politics, and is biased downwards to the extent that not all open wards in 2002 were previously reserved for women.

<sup>14</sup>The effect of reservations on women's representation might be biased downwards if there are positive spillover effects of reservations from treatment to control wards. Positive spillovers might, for example, stem from the "demonstration" that women are competent legislators.

in just 14 percent of control wards (row 10).<sup>15</sup>

Interestingly, the women who won elections in treatment wards did so equally across the four stratification layers (open wards, and wards reserved for Other Backward Classes, Scheduled Castes and Scheduled Tribes) that the 1997 reservations were randomized within. A chi-squared test comparing the distribution of treatment seats in 2002 by stratification layer, and treatment seats where women won in 2002 by stratification layer, is unable to reject the possibility that the distributions are equal.

That the 1997 reservations affected the 2002 elections is corroborated by a comparison of wards that were reserved in 1997 and 2002 with wards that were not reserved in 1997 and were reserved in 2002 (results available upon request). This analysis reveals that the effects of reservations in 1997 are noticeable five years after even if we restrict our attention to wards that were reserved in 2002. For example, the number of female candidates in wards that were reserved in 1997 (7.4) was higher than the average number of female candidates in wards that were open in 1997 (6.5).

It is important to note that since the reservation status of wards in 1997 and 2002 was random, the effect of the reservations in 1992 will have equally "shown up" in constituencies that are open and reserved in 1997 and 2002. The estimated impact of the 1997 reservations on electoral outcomes in 2002 is accurate then, but is conditional on there having been reservations in 1992.

So far I have presented striking evidence on the fact that quotas improve the chances of women winning elections even after quotas are withdrawn. A natural question that arises from such analysis, however, is what are the possible mechanisms through which reservations impact subsequent elections? I turn to exploring this question next.

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<sup>15</sup>Competitive candidates are defined as those that received five percent or more of their constituency's vote.

## 5. Mechanisms through which reservations ‘work’

In order to structure the exploration of how reservations have their next-election effects, consider the steps that women have to go through in order to be elected to office. Women must first decide whether they wish to run for office or not. Those who decide to run for office approach the decision-makers within their household (usually the men—husbands or fathers-in-law) in order to gain their assent. If this is granted, they may approach the political party of their choice for the party’s nomination (known as the party "ticket") for the ward in which they reside. Alternatively, parties might approach prospective candidates to run for office (possibly based on the recommendations of local party cadres—although the ultimate decision on whether a candidate runs for office vests with the party’s leadership), in which case prospective candidates would confer with their families after being approached by parties. Parties can nominate a maximum of one candidate for each electoral ward. Candidates who secure party tickets compete with one another at the polls, where incumbents might have an advantage and voters choose between candidates. The candidate who garners a plurality of votes wins office. Corporators may try to use their time in office to build an incumbency advantage. Five years later, elections are held again. Although this is a radically simplified representation of a complex election process, it captures its essential features.

In light of this stylized representation of elections, we may discern four hurdles that women face in their path to power. These might occur as women face entrenched male incumbents, or as they face opposition to their candidacies from people in their households, from parties and among voters. I explain how reservations might improve the performance of women at each of these stages, and provide preliminary tests of these conjectures below.

Briefly, I find that reservations largely work by introducing into politics a group of female candidates who are able to run for and win elections even after reservations lapse, and by allowing parties to "learn" that women can win elections.

This analysis is not as straightforward as the analysis presented previously since while the reservations policy ensures that only women run for office (and are therefore elected)

from reserved seats, the policy does not directly manipulate variables such as the number of female candidates or voter registration by ward, both of which, as discussed below, might be intermediate mechanisms through which reservations influence elections. The impact of such intervening variables, however, might be causal to the degree that they are determined temporally prior to the election of women, and might influence the probability of women winning office. In order to deal with the challenge of observational data, I supplement the difference in proportions and means tests used above with multivariate regressions. Although this analysis does not produce definitive results, it provides us with a starting point with which to think about the mechanisms through which quotas affect subsequent elections, and indicates the conditions under which we might expect the effects of reservations to hold and persist.

**Incumbency hurdle:** Six of the eight women who won elections from treatment wards in 2002 were incumbents. The results in Table 4 corroborate this finding. I first use a logistic model, with a dummy for whether or not the winners in the 2002 elections were women as the dependent variable and with observations restricted to wards that were not reserved in 2002, to replicate the main result of the paper. Regression 1 shows that quotas for women in 1997 (the treatment) are a significant predictor of the dependent variable. Consistent with the main result of the paper, the coefficient of 1.970 on the treatment dummy means that having a ward reserved for women in 1997 increased women's chances of winning the election by 18 percentage points, from 4 to 22 percent in 2002. Regression 2 adds dummies for whether a male or a female incumbent corporator ran for office to the base logistic regression. The dummy for whether a female corporator ran for office yields a positive and statistically significant coefficient. Together, these figures indicate that whether a female incumbent ran for office explains much of the dependent variable.

Despite these results, it would be incorrect to conclude that an incumbency advantage explains the improved election prospects of women, for at least two reasons. First, compar-

isons of incumbents and non-incumbents probably suffer from a selection bias. Incumbents, for example, might do better than non-incumbents because they have superior abilities rather than because of their status as incumbents. Second, we, in fact, have reasons to believe that incumbents in BMC elections suffer from an incumbency disadvantage,<sup>16</sup> a pattern which has been shown to hold in the case of India’s national and state elections (Linden 2004; Uppal 2005).<sup>17</sup> In light of this, perhaps women suffer less of an incumbency disadvantage than men? This possibility too is not sustained by the data.<sup>18</sup>

All this suggests that reservations mainly work through selecting a group of female winners in 1997 that are able to win office in 2002 after reservations have lapsed. The number of women who would have been able to win office in the absence of reservations appears to have been so low that the mere introduction of a group of female candidates into politics under the 1997 reservations policy—regardless of their propensity to develop an incumbency advantage or disadvantage—increased the proportion of women that won office in 2002.

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<sup>16</sup>For the 2002 BMC elections, only 55 percent of the incumbents from 1997 (who were not prevented from running for office by reservations) ran for office, of which only 56 percent won. In comparison, 88 percent of incumbent legislators in the United States—where incumbents have a well-documented advantage—ran for office again, of which 90 percent were reelected (Uppal 2005).

I am unable to precisely estimate whether BMC legislators suffer from an incumbency disadvantage or not because the state-of-the-art technique for determining the extent of incumbency disadvantage, which controls for selection effects, is to use regression discontinuity design to compare the electoral performance of winners and near-winners of elections over time. This technique reduces the dataset to too small a size to yield statistically meaningful results.

<sup>17</sup>Although the presence of an incumbency disadvantage is somewhat surprising—particularly for scholars of U.S. politics—we can imagine several theoretical reasons why incumbents could be disadvantaged. Chhibber (1999), for example, argues that incumbents may be disadvantaged in India due to the absence of secondary associations which could help incumbents mobilize and lock-in votes. This explanation is consistent with Fenno’s (1992) understanding that U.S. Congressmen secure an incumbency advantage through creating a feeling of solidarity between themselves and their constituents, a feeling which secondary associations might foster. Linden (2004) and Uppal (2005), on the other hand, argue that the disadvantage that incumbents face in India stems from intense political competition, which makes investing in incumbency advantage unprofitable for incumbents since election results are not predictable.

<sup>18</sup>While 47 percent of male incumbents from 1997 ran for office in 2002, only 38 percent of female incumbents ran in the 2002 election. Of these, while 55 percent of male incumbents won office in 2002, 60 percent of female incumbents won office in 2002. The differences in these figures by sex are small and are probably statistically insignificant.



**Individual and familial hurdles:** Women’s underrepresentation in politics may be caused by a dearth of female candidates. Women may not run for office for a number of reasons, including because they do not view themselves as being qualified to run (Fox and Lawless 2004), because they are unable to negotiate an independent space for themselves within their households (Chhibber 2002), or because their husbands, fathers-in-law or mothers-in-law disapprove of their candidatures (Honour, Barry and Palnitkar 1999). Reservations might increase the number of women who try to run for office by relaxing these constraints.<sup>19</sup> Hence we would expect treatment wards to have more women candidates, including "new" women candidates that ran for the first time in 2002, than control wards. These expectations are confirmed by the data.<sup>20</sup>

In order to ascertain whether the 1997 reservations increased the number of new women that ran for office in 2002, I compare the 2002 candidate list to the 1997 one in order to code whether those who ran for office in 2002 ran in 1997 as well.<sup>21</sup> This analysis reveals that

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<sup>19</sup>The clearest evidence of this mechanism at work would be in wards where there are close elections. Since the winner of close elections may be viewed as being "randomly" chosen from amongst the top two candidates in the election, an exogenous increase in the number of female candidates that run for office—caused by the reservations policy—should increase the probability that a woman is in the top two candidates in an election, and therefore the probability that a woman wins office. Unfortunately, my data do not provide me with enough statistical power to conduct this test (11 of the 37 elections in treatment wards and 20 of the 81 elections in control wards were close, that is, were won with a margin of less than 5 percent of the vote in 2002).

<sup>20</sup>The concern that female candidates might be proxies or tokens for male members of their families is attenuated here since I am concerned with the extent to which women run for office after reservations lapse, when male politicians could run for office themselves. Interestingly, whilst the media has spent much on decrying prominent proxy candidates (most famously Ms. Rabri Devi, who was “unanimously” elevated as Chief Minister of the state of Bihar when her husband, the erstwhile Chief Minister, was imprisoned on corruption charges), the one systematic study of the quality of women voted into power (Ban and Rao 2008) finds that “women leaders are drawn from the upper end of the quality distribution of women” (1). Chattopadhyay and Duflo’s (2004) finding that villages headed by women enjoy better infrastructure and welfare delivery is consistent with Ban and Rao’s conclusion.

<sup>21</sup>The comparison is difficult since there is no standard transliteration of Indian names from local languages into English, since candidate lists do not consistently place first names first, last names last and so forth, and because of the large number of comparisons that I needed to conduct. In order to deal with these issues, I modify and employ a fuzzy matching procedure developed by the Election Commission of India (ECI) to identify duplicate records in the list of eligible voters. I embed the ECI’s algorithm in a larger Visual Basic program that creates all possible permutations of the 1997 female candidate names, and compares each one of these to the names of the female candidates that ran in 2002. The algorithm makes over 3.3 million comparisons, and produces a “match score” for each comparison. The lower the match score, the most “distant” the match. I then manually examined every paired comparison that yielded a match score of 90 (out of 100) or higher, and coded those candidates whose 1997 and 2002 addresses matched as having run in 1997. This yields, for each of the female candidates that ran in 2002, a dummy for whether they had

treatment wards had a higher average number of new female candidates (that is, candidates that did not run in 1997) than did control wards (row 9 of Table 3). Consistent with this result, control wards had a lower average number of female candidates (row 3) and competitive female candidates (row 6) run for office per ward than did treatment wards. All these differences are statistically significant using a one-tailed difference of means test at the one percent level. This suggests that reservations might have altered the chances of women securing office in 2002 by continuing to expand the pool of female candidates that run for office even after reservations lapsed. Indeed, treatment wards that elected female candidates had the greatest number of female candidates per ward in 2002 (1.75).

Further evidence for this mechanism is presented in regression 3 of Table 4, which adds controls for whether any female candidate ran for office, the number of female candidates and the number of female candidates squared to the base regression.<sup>22</sup> The positive and negative (and statistically significant) coefficients on number of female candidates and its squared term, respectively, indicates that having more women run for office in a ward increases the odds that a woman will win the election with diminishing returns (the turning point for the average ward occurs at 2.5 female candidates), possibly because increasing the numbers of female candidates tends to "split" the vote for women. This evidence is consistent with the conjecture that the beneficial effect of quotas occurs through increasing the number of female candidates that run for office. Note, however, that I am not arguing that women no longer face opposition to their candidatures within the household, but rather that reservations relax this constraint somewhat.

**Party hurdles:** A third hurdle that women face in their path to power is getting a party ticket. Parties systematically grant women fewer tickets than they grant men. The four major parties in the 1997 and 2002 BMC elections granted women 32 to 42 percent of the

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run for office in 1997 or not.

<sup>22</sup>Regressions 3 and 7 employ, as per Zorn's (2005) recommendation, Firth's penalized-likelihood logistic regressions since employing the regular logistic regression is not possible due to the separation problem. The latter arises because women did not win office in *all* wards where no women ran for office.

tickets in all wards. Parties, however, granted most of these tickets to women in reserved wards. Women received only 7 percent of the tickets in unreserved wards.<sup>23</sup> Further, getting a party ticket is critical to women's chances of winning elections. Few independents of either sex win elections—9 and 3 corporators in the BMC were independents in 1997 and 2002, respectively—and all the female corporators elected in 1997 and 2002 were elected on party tickets. So while getting a party ticket is critical for women to win elections, they are systematically granted fewer tickets than are men.

In order to understand how reservations might alter the propensity of parties to grant women tickets, consider the logic of why parties would grant female candidates tickets. As elsewhere, parties in India generally grant candidates tickets based on their perceived electability. Considerations of ethnicity, caste, money and "muscle power" play a large role in the process (Singh, M. 2003). Parties might deny women tickets for two reasons: either because of ideology (in Becker's [1957] terminology, these parties discriminate based on "taste"), or because they do not perceive women to be electable ("statistical discrimination"). We may therefore classify parties into two types, based on their reasons for granting or denying women tickets. We expect taste-discriminating parties to deny women tickets both when reservations are in effect and after they have been withdrawn, and statistical-discriminating parties to grant women tickets when reservations are in force, but to only do so once reservations have been withdrawn to the degree that they view women as being electable.

The four main parties in the BMC hardly behaved as taste-discriminating parties since they all took the opportunity to run female candidates in wards that were reserved in 2002 (Table 5, column 1). There is also some weak evidence to suggest that the major parties are statistical discriminators since their willingness to field candidates from treatment wards (column 3) is positively correlated with the degree to which their female candidates won the

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<sup>23</sup>Note that if equal numbers of men and women are to be granted party tickets across all wards, women would need to secure 25 percent of party tickets in unreserved wards, in addition to all the party tickets in reserved wards.

previous elections with reservations (column 4).<sup>24</sup> Together, these data suggest that parties have not just played along with the new rules of the game since reservations were introduced, but that they have used the reservations policy to learn about the ability of women to win elections, and have subsequently granted or refused women tickets based on their experience with female candidates.

**Voter hurdles:** The fourth hurdle that women might face on their path to power is with voters. Voters might discriminate against women, or might rationally not vote for them if they think that other voters will not vote for women. I consider each of these two constraints in turn.

First, the underrepresentation of women in politics might be as a result of voters' discrimination against women. Reservations might alter the influence of voters who discriminate against women as pro- or anti-women groups mobilize in response to the reservations policy. The evidence on this mechanism is inconclusive, however. On the one hand, turnout in treatment wards in 2002 statistically indistinguishable from turnout in control wards (Table 6, row 1), suggesting that reservations in 1997 had no discernible effect on turnout in 2002. On the other hand, the increase in the number of registered voters<sup>25</sup> between elections in treatment wards was triple the increase in voters in control wards (Table 6, rows 2-4). Further, the differential increase in the number of voters in treatment wards was driven by wards that did not elect women (where the average number of voters increased by approximately 3,300) rather than by wards that did elect women (where the average number of voters increased by approximately 1,000). This suggests that voters might have been mobilized in order to vote against women, and that this strategy was not tried or failed in treatment wards that did elect women.<sup>26</sup> The evidence remains mixed using the logistic regression test, as seen in

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<sup>24</sup>The Shiv Sena and Bharatiya Janata Party formed a pre-poll alliance in the 2002 elections. The party nomination patterns detailed in the text hold for the alliance rather than for the component parties.

<sup>25</sup>The ECI maintains an "electoral roll," or list of eligible voters. It is updated once every five years by ECI officers who physically verify the existence and residence of voters, and continuously at the initiative of citizens, who may petition the ECI to have their names added to the electoral rolls subject to verification. Citizens are often prompted by political parties to register themselves to vote.

<sup>26</sup>This explanation is consistent with newspaper accounts which suggest that political parties concentrate

regression 4 of Table 4.

Second, the low representation of women in politics might be due to a coordination failure amongst rational voters who are willing to vote for women, but think that other voters are not willing to do so. More specifically, if voters behave strategically in order to not "waste" their vote by considering candidates that others would not vote for (this is a common assumption in the literature, see Cox 1997 for a prominent application), we could imagine that reservations could move voters from an equilibrium where they consider only male candidates to one where they consider male and female candidates. Whether voters "tip" from one equilibrium to the next would depend on whether people think that others will consider female candidates or not. Assuming that turnout in reserved wards is a measure of voters' willingness to consider female candidates (which may be the case because voters could have chosen to abstain from voting in 1997 if they were not willing to consider female candidates), I expect seats within the treatment group and with high turnout in 1997 to be more likely to vote for female candidates in 2002. In order to test for this channel, I include the interaction between turnout in the 1997 election with the treatment dummy, and its constituent terms, in the base logistic regression. My prior, which is not borne out by the test (Table 4, regression 5), is that voters will be more likely to vote for women candidates in constituencies where turnout was high in 1997.<sup>27</sup>

Regressions 6 and 7 of Table 4 pool the multivariate tests for the mechanisms by which reservations might influence the chances of women securing office. Note that these regressions do not include a test for whether parties "learn" to nominate female candidates since I had

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their voter registration drives on more conservative and poorer populations, with India's experience of a backlash against caste-based reservations (Weiner 1978; Wilkinson 2000), and with a literature on voting behavior in the U.S., which suggests that increases in voter registration by African-Americans in the 1960s was accompanied by a similar, if not greater, increase in voter registration on the part of whites (Alt 1994).

<sup>27</sup>In fact, the coefficient for the interaction between turnout and the treatment dummy is negative, rather than positive, and is weakly statistically significant at the 10 percent level. This voter coordination mechanism, per Cox (1997), should apply to the top two candidates in every election. This means that the binary dependent variable in the logistic regression test for the voter coordination mechanism could be recoded as a 1 if either of the top two candidates in an election is female. Recoding the dependent variable in this manner reconfirms my previous result: I find no evidence that the extent to which voters coordinate on considering female candidates in 2002 is dependent on voter turnout in elections with reservations in 1997.

not tested this mechanism in a regression framework. Regression 6 combines tests for the mechanisms for which we have the strongest evidence for: it includes indicators for whether incumbents ran for office, and for the number of female candidates and its squared term. Both mechanisms are associated with an increased probability of a woman winning an election. Regression 7 adds to this specification indicators for the voter mobilization and coordination mechanisms. In this pooled regression, the only statistically significant predictor for whether a woman is whether a female incumbent ran for office. Overall, this analysis indicates that reservations work in part by introducing into politics women who are able to win elections after reservations are withdrawn.

## 6. Conclusions

I have exploited a natural experiment to present evidence on the impact of quotas for women on their chances of winning subsequent elections. In an analysis of elections for Mumbai's city legislature, I found that women's chances of securing political office in wards that had been reserved for women in the previous election was approximately five times their chances in wards that had not been reserved for women previously. This is a remarkably large effect.

I detailed several mechanisms by which reservations could boost women's chances of winning elections. While the data are not conclusive, the evidence suggests that reservations affect subsequent elections in part by introducing into politics women who are able to win elected office even after reservations are withdrawn and by increasing the willingness of parties to grant women tickets. I find evidence against the possibility that reservations allow non-discriminatory voters to coordinate on considering female candidates for office. The data are inconclusive on whether reservations cause some voters to mobilize against voting for women or not, and on whether the increased number of female candidates boosts the chances of women winning office.

Although my investigation of the channels through which reservations might impact

women's chances of winning elections was hindered by the limited size of my dataset, and by the complexity of the processes that keep women out of power, my exploration of the mechanisms by which reservations work provides ground for future work, and, as I suggest below, also yields insights into the circumstances under which we might expect the effects of reservations to hold and persist. And whatever the variety of the hurdles that women face in political life, we now know that reservations have managed—in one city—to cut through it all to increase women's chances of winning elections. That they have done so is remarkable, given the deep-seated prejudices against women in Indian society, and India's checkered experience with caste-based reservations.

While the findings of this paper invite replication, as do all experimental studies, I expect the effects of reservations uncovered here to hold in a variety of settings. Most obviously, the result that reservations boost women's ability to win elections after they are withdrawn is likely to hold in places with a reservations system similar to that described here. Other local legislatures in India fit this bill, as do the legislatures of countries like Jordan, Rwanda and Uganda, which have reservations—rather than voluntary or party list quotas—for women. Second, the fact that the women who win elections in treatment wards are mainly incumbents suggests that the effects of reservations are likely to hold when male incumbents from the election without reservations are weak, when women elected under the reservations policy are of sufficiently high quality (or are able to use their time in office) to be reelected after reservations lapse, and when neither voters nor political parties display a "taste" for discriminating against women. Unfortunately, it is not clear whether quotas more generally—whether those based on ethnicity, for example—could have the same beneficial effects on subsequent elections. These could have lasting positive effects to the degree that politicians selected by the quota system are of a high enough quality (or are able to use their time in office) to be reelected once reservations lapse. On the other hand, reservations might not work if people have a "taste" for discriminating against people based on their ethnicity or if voters find it easier to mobilize to vote against people of different ethnicities than of

different genders.

A separate but related question is how far into the future will the knock-on effects of reservations uncovered here persist. That reservations have their next-elections effects partly by introducing into politics a cohort of women that is able to continue to win office after reservations lapse means that anything that affects the ability of these women to win elections will affect the longevity of the effects of reservations. If female legislators, for example, are recruited for higher office subsequent to elections with reservations, the beneficial impact of reservations on the presence of women in the BMC would be attenuated.

Many questions about the efficacy of quotas, and other remedies for inequalities in political representation, remain: do the socio-economic effects of reservations persist after they are withdrawn? Do female politicians inducted by the reservations process at the local level go on to challenge state and national level politicians?<sup>28</sup> What types of political exclusion are quotas most effective at remedying? How do the effects of reservations compare to the effects of other types of quotas, and to the effects of other means of ameliorating inequalities in political representation, such as majority-minority redistricting? Do these have effects on subsequent elections as well?

Despite the remaining questions, the central finding of this paper—that quotas for women improve the chances of women winning elections even after quotas are withdrawn—has broad implications, especially for scholars of democracy. First, while much of the literature on democracy in plural societies either calls for explicit quotas for different groups of people (to form what Lijphart 1977 calls consociational governments), or warns against the use of such quotas since it leads to the permanent "ethnification" of politics (Horowitz 1985), this paper reminds us of, and provides strong evidence for, a third possibility: that quotas can themselves set in motion processes that ensure the fairer representation of people even after

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<sup>28</sup>The data are consistent with this possibility: since the introduction of quotas, the percentage of women in the state legislature, and in Mumbai's contingent to the state legislature, has approximately doubled to 4.2 and 5.9 percent, respectively. The percentage of women in India's national parliament similarly increased from 7.2 percent in 1991 to 9.2 percent in 2004. Whether reservations for women in local governments caused these increases is an interesting, researchable question.



quotas are removed. Recognizing this possibility should allow people to better design policies that ensure representation of the politically marginalized without permanently "ethnifying" politics. Second, while most political scientists argue that the virtues of democracy—such as fair representation and accountability—emerge over time, through the slow building of new social ties (Lipset 1960), culture (Putnam 1993) and class formations (Moore 1966), my examination the effects of quotas for women shows that there are ways in which policy makers can achieve fairer representation speedily. It is for these broad implications that the comparative analysis of policies to remedy inequalities in political representation promises to be an exciting field for research.

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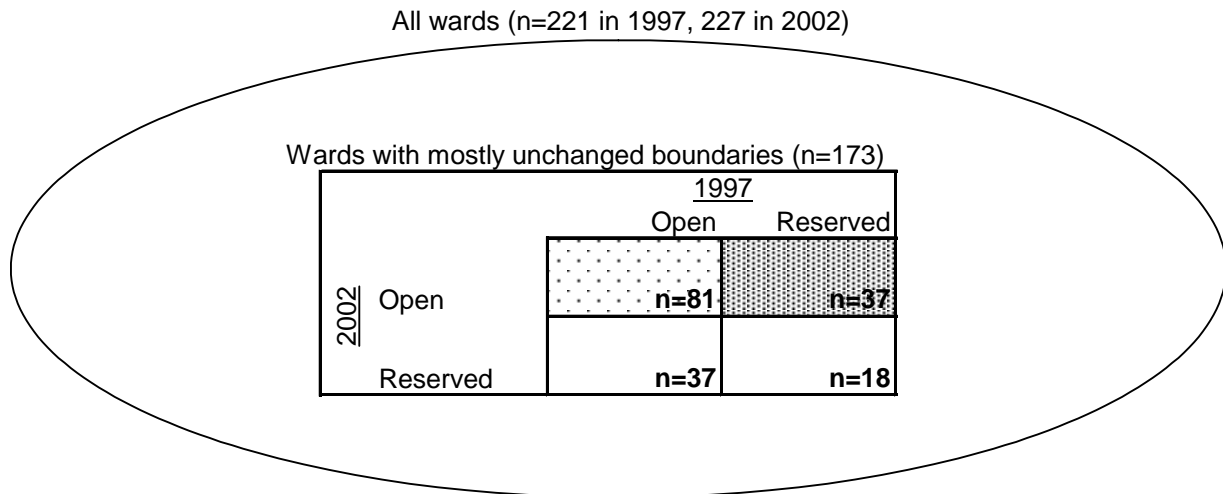
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Table 1. Constituency-wise reservations in 1997 and 2002

Seats reserved for:	1997		2002	
	Number	Percent	Number	Percent
Open, regardless of caste	145	65.6	149	64.8
<i>Of which:</i> Reserved for women	48	21.7	50	21.2
Other Backward Classes	60	27.1	61	27.3
<i>Of which:</i> Reserved for women	20	10.0	20	9.3
Scheduled Castes	14	6.3	15	7.1
<i>Of which:</i> Reserved for women	4	1.8	5	2.2
Scheduled Tribes	2	0.9	2	0.9
<i>Of which:</i> Reserved for women	1	0.5	1	0.4
<b>Total</b>	<b>221</b>	<b>100.0</b>	<b>227</b>	<b>100.0</b>
Reserved for women	73	33.9	76	33.0
Other reservations	51	22.2	52	23.4
Open to all	97	43.9	99	43.6

*Note:* Constituencies reserved for Other Backward Classes, Scheduled Castes and Schedule Tribes were ones with the highest concentrations of Other Backward Classes, Scheduled Castes and Schedule Tribes, respectively. Constituencies were reserved for women using random, stratified and independent draws in 1997 and 2002. See text for details.

Figure 1. Control and treatment groups to calculate the next-election effects of reservations



**Legend**

- Control wards
- Treatment wards

Table 2. Contemporaneous, within-election effects of reservations in 1997 and 2002

	1997 elections			2002 elections		
	Reserved	Open	Difference	Reserved	Open	Difference
1 Percentage of female winners	100.0	3.4	96.6 ***	100.0	8.6	91.4 ***
2 Percentage of wards where at least one woman ran for office	100.0	43.9	56.1 ***	100.0	51.7	48.3 ***
3 Number of female candidates	8.2	0.7	7.5 ***	7.0	0.8	6.2 ***
4 Number of candidates	8.2	14.4	-6.2 ***	7.0	10.1	-3.1 ***
5 Female candidates as a percentage of candidates	100.0	4.5	95.5 ***	100.0	7.7	92.3 ***
6 Total percentage of votes received by female candidates	100.0	2.9	97.1 ***	100.0	6.9	93.1 ***
7 Average percentage of votes received by female candidates	16.1	2.0	14.1 ***	17.3	4.4	12.8 ***
8 Turnout, in percent of registered voters	42.5	47.0	-4.5 **	41.2	42.6	-1.4 *
9 Winning candidate vote margin	13.9	13.0	0.9	16.6	14.1	2.4
10 Number of wards	73	148	221	76	151	227

Note: \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1% using one-sided difference in proportions and means tests. Only women could run for office in reserved constituencies; men and women could run for office in open constituencies. Constituencies were reserved for women using random, stratified and independent draws in 1997 and 2002. See text for details.

1/ Competitive candidates are defined as those that received 5 percent or more of their constituency's vote.

Table 3. Next-election effects of the 1997 reservations on the 2002 elections

	The experiment		Difference
	Open in 1997, Open in 2002	Reserved in 1997, Open in 2002	
1 Percentage of female winners	3.7	21.6	17.9 ***
2 Percentage of wards where at least one woman ran for office	35.8	73.0	37.2 ***
3 Number of female candidates	0.5	1.1	0.7 ***
4 Number of candidates	9.1	10.6	1.5
5 Female candidates as a percentage of candidates	4.4	11.9	7.4 ***
6 Number of competitive female candidates 1/	0.1	0.5	0.3 ***
7 Number of competitive candidates 1/	3.9	4.1	0.2
8 Competitive female candidates as a percentage of competitive candidates 1/	3.2	11.8	8.6 ***
9 Number of new female candidates 2/	0.3	0.7	0.4 ***
10 Percentage of wards where any female candidate was competitive 1/	13.6	43.2	29.7 ***
11 Total percentage of votes received by female candidates	3.3	15.0	11.7 ***
12 Average percentage of votes received by female candidates	2.4	10.0	7.5 ***
13 Turnout, in percent of registered voters	42.2	41.6	-0.6
14 Winning candidate vote percentage	42.8	41.0	-1.9
15 Winning candidate vote margin	15.3	13.5	-1.8
16 Number of wards	81	37	

Note: \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1% using one-sided difference in proportions and means tests. Only women could run for office in reserved constituencies; men and women could run for office in open constituencies. Constituencies were reserved for women using a random, stratified and independent draws in 1997 and 2002. See text for

1/ Competitive candidates are defined as those that received 5 percent or more of their constituency's vote.  
2/ Candidates are coded as "new" if they did not run in 1997.

Table 4. Logistic analysis of the determinants of whether a female corporator was elected in 2002

Dependent variable: Dummy for whether a female corporator was elected in 2002	1	2	3	4	5	6	7
Dummy for treatment	1.970 [0.711]***	0.798 [1.017]	1.166 [0.743]	2.636 [0.838]***	8.451 [3.612]**	0.579 [0.932]	11.073 [6.277]*
Dummy for whether the male incumbent ran for office		-0.247 [1.428]					0.538 [1.546]
Dummy for whether the female incumbent ran for office		3.570 [0.928]***				2.841 [0.934]***	2.584 [1.119]**
Dummy for whether any female candidate ran for office			-1.042 [2.406]				-0.622 [2.808]
Number of female candidates			4.305 [2.068]**			5.292 [2.555]**	3.216 [2.875]
Number of female candidates squared			-0.853 [0.490]*			-1.201 [0.630]*	-0.626 [0.716]
Turnout in 2002, in percent of registered voters				0.107 [0.067]			0.164 [0.156]
Change in male voters registered between 1997 and 2002 elections, in percent				-129.610 [74.398]*			44.847 [71.856]
Change in female voters registered between 1997 and 2002 elections, in percent				58.781 [68.363]			-49.465 [81.917]
Turnout in 1997, in percent of registered voters					0.080 [0.057]		-0.023 [0.102]
Dummy for treatment x Turnout in 1997, in percent of registered voters					-0.147 [0.078]*		-0.255 [0.135]*
Constant	-3.258 [0.588]***	-3.704 [1.010]***	-5.073 [1.442]***	-7.887 [3.069]**	-7.099 [2.942]**	-7.455 [2.368]***	-11.225 [6.744]*
Number of observations	118	118	118	118	118	118	118
Pseudo R-squared	0.12	0.40	—	0.22	0.17	0.52	—

Note: Regressions 3 and 7 use Firth's penalized-likelihood approach to deal with a separation problem. See footnote 22 for details. Standard errors in brackets. \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1%.



Table 5. Which parties granted women tickets in 2002?

	Percentage of female candidates			1997 female candidate success rate
	Reserved in 2002	Open in 1997, Open in 2002	Reserved in 1997, Open in 2002	
Shiv Sena-BJP coalition 1/	100.0	3.7	21.6	
Shiv Sena	77.6	2.5	16.2	75.5
Bharatiya Janata Party	22.4	1.2	5.4	32.0
Indian National Congress	96.1	3.7	16.2	15.2
Nationalist Congress Party	90.8	4.9	8.1	0.0

*Note:* Only women could run for office in reserved constituencies; men and women could run for office in open constituencies. Constituencies were reserved for women through random, stratified and independent draws in 1997 and 2002. See text for details.

1/ I do not include figures for the Shiv Sena-BJP coalition for the 1997 election since the parties competed against one another in that election.

Table 6. The impact of reservations on voter mobilization

	The experiment		
	Open in 1997, Open in 2002	Reserved in 1997, Open in 2002	Difference
1 Turnout in 2002, in percent of registered voters	42.2	41.6	-0.6
2 Change in number of voters registered between 1997 and 2002 elections	819	2,777	1,958 **
3 Change in number of male voters registered between 1997 and 2002 elections	632	1,601	969 *
4 Change in number of female voters registered between 1997 and 2002 elections	187	1,175	989 **
5 Number of wards	81	37	

*Note:* \* significant at 10%, \*\* significant at 5%, \*\*\* significant at 1% using one-sided difference in means tests. Only women could run for office in reserved constituencies; men and women could run for office in open constituencies. Constituencies were reserved for women using random, stratified and independent draws in 1997 and 2002. See text for details.

Appendix Table 1. A comparison of open and reserved wards in 2002

1997 election indicators	Open wards in 2002 (a)	Reserved wards in 2002 (b)	pvalue for H: a-b ? 0
Percentage of wards reserved for women in 1997	31	33	0.857
Percentage of female winners	34	36	0.751
Percentage of wards where at least one woman ran for office	63	64	0.907
Percentage of wards where any female candidate was competitive 1/	38	49	0.173
Percentage of wards where the Indian National Congress won	19	29	0.159
Percentage of wards where the Bharatiya Janata Party won	14	7	0.229
Percentage of wards where the Shiv Sena won	42	51	0.293
Number of female candidates	3	3	0.727
Number of candidates	12	12	0.807
Female candidates as a percentage of candidates	34	36	0.833
Number of competitive female candidates 1/	1	1	0.782
Number of competitive candidates 1/	4	4	0.966
Competitive female candidates as a percentage of competitive candidates 1/	33	36	0.653
Total percentage of votes received by female candidates	33	36	0.657
Average percentage of votes received by female candidates	6	8	0.521
Turnout, in percent of registered voters	44	45	0.302
Winning candidate vote percentage	39	40	0.290
Winning candidate vote margin	13	12	0.949
Observations	118	55	

*Note:* Only women could run for office in reserved constituencies; men and women could run for office in open constituencies. Constituencies were reserved for women using random and stratified draws in 2002. See text for details.

1/ Competitive candidates are defined as those that received 5 percent or more of their constituency's vote.