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The Redistributive Effects of Political Reservation for Minorities: Evidence from India
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ABSTRACT

We examine the impact of political reservation for disadvantaged minority groups on poverty. To address the concern that political reservation is endogenous, we take advantage of the state-time variation in reservation in state legislative assemblies in India generated by national policies that cause reservations to be revised and the time lags with which revised reservations are implemented. Using data on sixteen major Indian states for the period 1960-2000, we find that increasing the share of seats reserved for Scheduled Tribes significantly reduces poverty while increasing the share of seats reserved for Scheduled Castes has no impact on poverty. Political reservation for Scheduled Tribes has a greater effect on rural poverty than urban poverty, and appears to benefit people near the poverty line as well as those far below it.

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1 Introduction

Many countries have affirmative action policies, which give preferential treatment to historically disadvantaged minority groups. These policies are extremely controversial. One set of issues relates to whether these policies benefit the intended beneficiaries. Do the policies actually improve the socioeconomic outcomes of the minority groups? Which members of the minority groups benefit? A second set of issues relates to the redistributive nature of affirmative action policies. If minority groups are given preferential treatment, then aren't non-minority groups made worse off? To the extent that affirmative action policies confer few or no benefits to minority groups and hurt members of non-minority groups, then society might be worse off with such policies. While there is some empirical work on the effect of affirmative action on the intended beneficiaries, there is little that quantifies its overall effects (a brief review of the related literature is provided in Section 2). This paper takes a step forward by examining the effect of one type of affirmative action, political reservation, on overall poverty in India. To our knowledge, this is the first paper that estimates the impact of an affirmative action policy on poverty.

Poverty is a relevant outcome to study. First, poverty reduction is a major objective of public policy, especially in developing countries. Second, poverty rates are a tangible and frequently used measure of well-being. It remains an open question whether affirmative action successfully reduces poverty. It is expected to, given that historically disadvantaged minority groups account for a disproportionate share of the poor. However, if the benefits accrue only to the relatively well off members of minority groups and hurt the less well off members of non-minority groups, affirmative action can *increase* overall poverty!

India accounts for one-third of the world's poor, with about two-fifths of its population living below the international poverty line of $1.25 per day (Chen and Ravallion, 2008). It also has the largest and among the most aggressive affirmative action programs in the world, with seats explicitly set aside for members of disadvantaged minority groups (i.e., the

Scheduled Castes (SCs) and Scheduled Tribes (STs)) in higher education, public sector employment and political representation. Obviously these affirmative action programs, though in place for over 60 years, have not been sufficient to eliminate poverty. However, India's poverty rate has declined rapidly over this time period–between 1981 and 2005 alone, it declined from 60% of the population living below $1.25 per day to 42%–and it is of interest to understand the extent to which affirmation action contributed to this decline.

In general, regressing the outcome of interest on the measure of the affirmation action policy will not give the causal effect of the policy. This is because the policy variable is likely to be endogenous. For example, places where more minorities get elected may differ from places where fewer minorities get elected in ways that also affect the outcome, such as in their level of development or attitude toward minorities. Fortunately in the case of political reservations for minorities in India, there are institutional features that can be exploited to identify the causal effect of minority political representation. In particular, variation in minority political representation in the state legislative assembly arises from changes in the minority share of the population as measured by the census (the Indian Constitution calls for the share of seats reserved for SCs and STs in the each state to equal to their share of the state population in the last preceding decennial census) and the time lags with which reservations based on the new census shares are implemented (not until the state's first election after the reservations are revised via a formal delimitation process). We use this within-state cross-time variation in share of seats reserved for minorities to identify the effect of minority representation on poverty. We elaborate on this empirical strategy, which originated in Pande (2003), in Section 3.

We implement this empirical strategy using state panel data on sixteen Indian states for the period 1960-2000 (we describe these data in Section 4). In Section 5, we present the estimation results. Our main finding is that increasing the share of seats reserved for minorities reduces overall poverty. Additionally, we find that it is political reservation for STs alone that significantly reduces poverty; SC political reservation has no impact on poverty.

These results are in line with Pande (2003), who found that ST and SC reservation in state legislative assemblies have different policy effects, with the former increasing spending on ST welfare programs and the latter increasing the number of state government jobs set aside for minorities. Welfare programs primarily target the poor whereas reserved jobs are open even to better off minorities, so it is not unexpected given Pande's results that ST reservation would reduce poverty (while SC reservation would not). These results survive a variety of robustness checks, including allowing for nonlinear effects of minority population share.

Next, we explore some potential explanations for the differential impact of ST and SC reservation: geographic isolation (STs tend to be more segregated, which might facilitate targeting of aid), social heterogeneity (greater caste fragmentation might make cooperation more difficult) and support for the Congress Party (which under Indira Gandhi has a well-advertised aim to reduce poverty). We find some evidence suggesting that greater caste fragmentation reduces the effectiveness of SC reservation in fighting poverty. A final empirical exercise is to examine whether the effect of ST and SC reservation in the state legislative assemblies changed after the passage of the 73rd and 74th Amendments in 1993, which devolved more power to local governing bodies. We find that ST reservation has an even larger negative effect on rural poverty after these constitutional reforms. We conclude in Section 6.

2 Background

2.1 Related Literature

This study adds to the large literature on affirmative action (see Holzer and Neumark (2000) for a review, though it is focused on the United States context), including a rapidly growing one in the Indian context. In this subsection, we briefly discuss the empirical studies in the Indian context.

Galanter (1984) provides a rich analysis of the various affirmative action policies (in

employment, education and political representation) for the SCs and STs, but does not quantify their effects.[1] More recently, a number of papers have estimated the impact of political reservation (Duflo (2005) offers a review). Some institutional features of India's political reservation policy enable researchers to convincingly identify its effects. Pande (2003) takes advantage of the time lag between when a new census count is taken and when its results are applied to political reservations in the state legislature to identify the effect of minority representation in the state legislature on policy outcomes. She finds that increasing minority representation increases transfers to minorities: ST reservation increased spending on ST welfare programs, and SC reservation increased the share of state government jobs set aside for minorities. Additionally, ST reservation lowered education spending and overall government spending. These results clearly establish that legislator identity matters for policy outcomes, but as Pande writes in her conclusion, "It would, however, be premature to view this paper's findings as suggesting that political reservation is a welfare-enhancing policy" (p. 1147). Our paper extends Pande's paper by examining poverty as an outcome; we use the same identification strategy, also use state panel data, and also are concerned with SC and ST representation in the state legislature.

Several studies on the effects of political reservation examine a more local level of government, the Gram Panchayat (village council) level. Each Gram Panchayat is comprised of a small group of villages and is responsible for the administration of public goods in these villages. Some seats for pradhan (chief of the Gram Panchayat) are reserved for minorities and women, with the reserved seats randomly assigned across Gram Panchayats. This random assignment feature has been exploited by researchers to identify the effects of political reservation for minorities and women on the allocation of local public goods. The first of these studies was Duflo and Chattopadhyay (2004), who find that Gram Panchayats that are randomly assigned a female pradhan tend to spend more on public goods that women con-

[1] Dushkin (1972) and Parikh (1997) also provide useful background information on social groups and politics in India.

sider more important, such as drinking water and roads in West Bengal and drinking water in Rajasthan. Besley, Pande, Rahman and Rao (2004), using data from Andhra Pradesh, Karnataka and Tamil Nadu, find that having a SC/ST pradhan significantly increases the probability that SC/ST households have a toilet, electric connection or private water line provided by a government program since the last local election. Bardhan, Mookherjee and Parra Torrado (2010), using data from West Bengal, find that households in villages with a SC/ST pradhan tend to receive more benefits from the local government, particularly for housing and toilet construction and improvements. Interestingly, within villages, there is a redistribution of employment program benefits away from non-SC/ST landless households toward SC/ST households when there is a SC/ST pradhan. Finally, Duflo, Fischer and Chattopadhyay (2008) find that having a SC pradhan significantly increases public goods provided to hamlets where SC are concentrated.

The above studies convincingly show that political reservation affects policy outcomes and public goods provision in India, and seems to redistribute resources in favor of the targeted groups. But given the multifaceted effects, including increases in some types of resources but reductions in others, it is an empirical question whether political reservations provide net benefits to the populace. Our paper approaches this question by estimating the reduced-form effect of political reservations for minorities on overall poverty. We do not purport to know or be able to estimate India's social welfare function. We note, though, that poverty reduction is a major objective of the Indian government, and therefore it is of interest to know, when all the changes in policy and resource allocation are taken together, whether political reservation for minorities reduced poverty. Does helping minorities through political reservations end up hurting the poor? If it does, then society must weigh the benefits to minorities against the harm to the poor. Otherwise, it can feel assured that helping minorities also helps alleviate poverty, which might soften some opponents of political reservation for minorities.

This is the first study to our knowledge that estimates the effect of any type of affirmation action policy on poverty. Additionally, it is one of only a few studies that estimates the net

effect of affirmative action.[2] Studies have tended to focus on the effect of affirmative action on intended beneficiaries, which we agree is the first step in the evaluation of affirmative action. There is good evidence in US and India that affirmative action does redistribute resources to the benefit of the targeted groups, so the next step is to figure out the net benefits (net of costs, including any costs to non-targeted groups).

2.2 Reservation in State Legislative Assemblies for Scheduled Castes and Scheduled Tribes in India

Scheduled castes (groups having low social and ritual standing) and scheduled tribes (groups distinguished by their tribal culture and physical isolation) have historically been excluded from opportunities and rights that lead to socioeconomic advancement in Indian society.[3] Combined with low social mobility–social group is hereditary, and marrying outside one's group is rare–the discrimination has led to poor socioeconomic outcomes for STs and SCs that are repeated generation after generation. In 2004-05, the share of the population living below the official Indian poverty line was 46% of STs and 37% of SCs; in contrast, it was 23% among non SC/STs.[4] Thus the STs and SCs account for a disproportionate of India's poor: STs make up 8.6% of India's overall population but 14% of its poor, and SCs

[2]Bertrand, Hanna and Mullainathan (2010) estimate the effect of affirmation action in college admissions in India. They collect data on the labor market outcomes of applicants to an engineering college, and find that marginal lower caste group applicants benefit from attending the college (which they would not have been able to attend without the affirmative action program). However, the benefit is greater for the marginal high caste group applicant admitted compared to the marginal low caste group applicant admitted, suggesting that reserving college seats for lower caste group members leads to an inefficient allocation of educational slots. Chattopadhyay, Duflo and Fischer (2008) test for whether Gram Panchayats behave efficiently. They find that having an SC pradhan changes the composition of public goods provided, which indicates that the Gram Panchayat was not behaving efficiently under the assumption that preferences are homothetic. In this situation, reservation for minorities would raise efficiency–for a given level of resources allocated to minorities, the mix would now be allocated in greater accordance with their preferences.

[3]In the British era, these were called the depressed classes, and colloquially they have also been called the untouchables and backward classes though these terms are out of favor. The Constitution (Scheduled Castes) Order of 1950 and the Constitution (Scheduled Tribes) Order of 1950 lists which castes, races and tribes are designated SCs and STs, respectively. Pande (2003)'s Table 2 provides a concise summary of the criteria used to designate communities as SCs or STs.

[4]These figures are calculated based on data from the 61st round of the National Sample Survey, a nationally representative sample of households in India.

make up 20% of the population but 27% of the poor.

To improve the well-being of the SCs and STs, various affirmative action policies for SCs and STs have been instituted in the Indian Constitution. As far as political reservation is concerned, the original Indian Constitution (which took effect on January 26, 1950, creating the Republic of India) mandates representation for SCs and STs in the lower house of Parliament (i.e., the Lok Sabha, the directly elected national legislative assembly) and the state legislative assemblies. Additionally, the 73rd and 74th Amendments of 1992 mandated representation for SCs and STs at more local levels of government.[5] The seats for SCs and STs are set aside in proportion to their respective share of the total population in the state or part of state. Only members of the SC (ST) may stand for election in constituencies that have been reserved for SCs (STs), but voters of all social groups in the territorial constituency get to vote regardless of whether their constituency is reserved.

Since our empirical work concerns political reservation for SCs and STs in the state legislature, we proceed by providing more detail about the role of the state legislature, how reservations in the state legislature are set and how they change. India is a federal union of states. The state governments serve populations that are larger than many nations[6] and have a good deal of autonomy from the central government. The Indian Constitution delineates the responsibilities of the state and central governments, with some items under the exclusive control of the central government, some under the exclusive control of the states and other items under joint jurisdiction. Among the items in the state governments' purview are public order, police, public health and sanitation, intrastate roads, water, land,

[5]The 73rd Amendment concerns local governing bodies in rural areas (including the Gram Panchayats), and 74th Amendment concerns local governing bodies in urban areas. These amendments aimed to decentralize government in India; in Section 5.4, we assess whether this devolution of power from state to local governments changed the impact of SC and ST reservation in the state legislatures. In addition to the provisions for minority political representation, these amendments called for at least one-third of the seats in these local governing bodies to be reserved for women; prior to this, there was no political reservation for women in India. See Duflo (2005) for more on political reservation for women.

[6]The 16 states in our sample range in population from 10 million (Jammu and Kashmir) to 166 million (Uttar Pradesh) according to the 2001 Census. These 16 states make up for over 95% of India's total population of one billion.

agriculture and industries. Though items like education, social security and social insurance, and labor are under joint jurisdiction, in practice, state governments assume much of the responsibility. The primary way in which state legislative assemblies can affect outcomes in the state is through the allocation of state government spending. During the span of our data, 1960-2000, state governments undertook over half of total government expenditures in India (Khemani, 2004; Rao and Singh, 2001). Other ways include making laws, setting priorities, and managing lower levels of government. Thus the state legislature does have the meaningful power, and its composition can therefore have measurable consequences.

Reservation for SCs and STs in the state legislative assemblies follows a single policy rule that applies to all states: according to Article 332 of the Indian Constitution, the number of seats reserved for SCs and STs is such that the share of total seats in the state assembly reserved for each group equals that group's share of the total state population in the last preceding census. This policy rule makes clear where variation in minority political representation comes from. The primary source is the arrival of new census population figures. In this case, the Delimitation Commission is responsible for delimiting the constituencies for the national and state legislatures based on the new population data, revising the number of seats reserved in each state for SCs and STs based on the revised constituencies and each group's population share in the new census, and designating which specific constituencies are reserved for SCs and STs.[7] In our data set, which spans 1960-2000, the arrival of the 1961 and 1971 census counts caused reservations to change in the late 1960s and mid-1970s, respectively. The 42nd Amendment to the constitution in 1976 suspended new delimitations until after 2000, so reserved seats are based on the 1971 census to the end of our data period.[8]

[7]The Delimitation Commission is an ad hoc national committee formed after a census is taken, and is comprised of a supreme (national) court judge, high (state) court judge and the chief election commissioner. In each state, constituencies with the largest ST population are reserved for STs first. Which constituencies are reserved for SCs also depends on where SC population is higher, but with the constraint that the seats reserved for SCs be dispersed across the state.

[8]The intention behind freezing constituencies based on the 1971 census was to assure states that their representation in Parliament would not be perversely impacted by the successful implementation of family planning policies. The 84th Amendment in 2001 extended the freeze on the number of constituencies in Parliament and in the state legislative assemblies until after 2026, but permitted the adjustment of the territorial

Variation in share of seats reserved for SCs and STs also arises from institutional changes imposed from the national government. First, when the number of constituencies change, the share of seats reserved could change since the number of seats must be an integer. In 1961, two-seat constituencies were abolished, leading to fewer seats (previously, a given constituency could have multiple seats). Second, when the definition of SC or ST changes, the share of seats reserved change. The Scheduled Caste and Scheduled Tribe Orders Act of 1976, which mandated that a social group defined as a scheduled caste or scheduled tribe in any part of the state will be defined as so in the entire state, led to revised census figures for the SC and ST population and consequently revised reservations.[9] Finally, when a state's borders changes, then its calculated minority population share will change, leading to changes in the share of seats reserved; this is variation that we *do not* use in our empirical work since we want states that are consistently defined over time. The Punjab Reorganization Act of 1966, in which the Punjab then in existence was divided into present-day Punjab and the new state of Haryana, is the instance during our 1960-2000 sample period in which some state borders changed.[10]

Table 1 summarizes the sources of variation in share of seats reserved for SCs and STs in state assemblies discussed above. It must be noted that reserved seats in state assemblies are not adjusted immediately after the arrival of a new census count or the institutional changes. Instead, they are applied to the next election, when the current (typically five-year) term of all the members of the state legislative assembly end and voters must elect all new members for the next term. Since state elections are not held at the same time across states, the same arrival of a new census count or institutional change causes the share of seats reserved

boundaries of the constituencies and the reservations. The Delimitation Act, 2002 adjusted boundaries and the number of reserved seats based on the 2001 census, and was implemented beginning in 2008.

[9]It should be emphasized that the Constitution (Scheduled Castes) Order of 1950 and the Constitution (Scheduled Tribes) Order of 1950 make clear which groups are considered SCs and STs in each state. What the SC/ST Orders Act did was to make uniform the definition of SC/ST within a state.

[10]As we decribe in Section 4, Punjab and Haryana do not enter our sample until 1967, after the division. A small part of Punjab was added to Himachal Pradesh, a union territory that became a state in 1971 and which is not part of our analysis.

to change in multiple years (the middle column of Table 1 shows the first year the revised reservations could have been implemented), changing sooner in states that happen to have a state election sooner. These sources of changes in seats reserved, and the time lags with which they take effect, will be exploited for identifying the effects of reservation below.

3 Empirical Strategy

In theory, minority political reservation could increase or decrease poverty. Previous studies have found that political reservations for minorities tend to change policies and the allocation of public goods in favor of minorities. Such changes can be expected to improve the well-being of at least some minorities, and even non-minorities in poverty might benefit to the extent that these changes encapsulate more general anti-poverty measures than would otherwise have been undertaken. However, there might be elite capture (in which only the better off among the minorities receive the benefits) or the displacement of resources for non-minorities in poverty. In India, though the poverty rate is higher among minorities (40% for SCs and STs compared to 23% for the rest of the population in 2004-05), the number of people in poverty is higher among non-minorities (12 million in poverty among SCs and STs compared to 17 million in poverty in the rest of the population). In this context, helping minorities is not synonymous with reducing poverty–it could be that benefits are mostly go to the SCs and STs above the poverty line, or that the costs are borne predominantly by the non-minority poor. Thus, it is an empirical question whether minority political representation on net reduces poverty.

Suppose the relationship between minority share of legislative seats and poverty could be approximated as:

$$y_{st} = \alpha_s + \beta_t + \gamma Minority\ Rep_{st} + e_{st} \tag{1}$$

where y_{st} is the poverty rate in state s observed at time t. The variable $Minority\ Rep_{st}$ is the percentage of legislative seats held by minorities. α_s is the state fixed effects and control for any time-invariant state characteristics on poverty. β_t is the time fixed effects and control for any macroeconomic shocks or national policies that affected all states uniformly. Finally, e_{st} is the error term. The coefficient of primary interest is γ, which estimates the effect of minority political representation on poverty. In general, estimating Equation 1 by ordinary least squares (OLS) would not provide the causal effect of minority political representation. This is because in general, there would be omitted variables bias–places that tend to elect more minorities likely differ in ways that affect poverty as well. For example, they might be less discriminatory, which affects both the election outcomes of minorities as well as their economic outcomes. Or, they might be more socially progressive, which causes more minority candidates to be elected as well as more anti-poverty policies. State fixed effects mitigate this concern somewhat; however, there might be time-varying state characteristics that matter, such as changing attitudes about minorities.

In the case of India, though, such omitted variables bias is averted because minority political representation in the state legislative assemblies is determined by a simple policy rule that applies to all states.[11] This rule, that the share of the state's legislative assembly seats reserved for minorities must equal their share of the state's population, leaves no discretion on the part of individual states as far as minority political representation is concerned. As discussed in the previous section, all changes in reserved seats for minorities arise from the arrival of a new census count or institutional changes imposed from the central government. Thus, estimating Equation 1 using panel data on Indian states in the post-1950 era (after the Indian Constitution, which contained the rule, took effect) would lead to a less biased estimate of γ than in the general case. However, an important concern remains: minority

[11]Though SCs and STs can stand for election in unreserved constituencies, in fact virtually no seat has been won by SCs and STs in unreserved constituencies. Therefore, there is no difference between share of state legislative assembly seats held by SCs and STs and share of seats reserved for SCs and STs, and so the effect of minority political reservation that we estimate has the interpretation as the effect of minority political representation (in a context where there is affirmative action for minorities).

population share is positively correlated with minority political representation through the policy rule, but it might be correlated with poverty, too, for reasons other than minority political representation. This is quite plausible; for example, some resources may be allocated approximately on a headcount basis.

The obvious solution to address this concern–that minority population share is an omitted variable–is to add it as a control to Equation 1. If minority population share always exactly equalled share of seats reserved for minorities, though, there would be perfect collinearity and it would be impossible to separate out the effect of minority political representation. But in the case of India, three features of the policy rule and its implementation help us address the problem. First, the policy rule is based on minority population share in the last preceding census. Thus, we can control for minority population share of state s at time t in Equation 1 while still having variation left in the political reservation variable since the latter is based on a census (not an intercensal) population count. Second, the policy rule is implemented with a time lag. On the one hand, it takes several years for the Delimitation Commission to revise constituencies and reservations on the basis of the new census data. On the other hand, it could take several more years before a state implements the new reservations; states that have an election scheduled soon after the Delimitation Commission finishes would implement the new reservations earlier. Because of this time lag, we can control for minority population share in the last decennial census taken before time t while still having variation left in the political reservation variable. Third, the policy rule must be implemented subject to the constraint that the number of seats be an integer value. Thus due to rounding off to an integer, generally the reserved share of seats and the minority population share measured in the last preceding census do not match exactly.

Figure 1 illustrates the main intuition of our identification strategy. For the hypothetical state depicted, elections are held every five years beginning with 1962 for the 1960-2000 period. Due to the time lag between when a census is taken and when reservations based on it are implemented, the share of seats reserved for SC/ST differs from the SC/ST share

of the population in the last census in some years. Thus, between 1961 and 1966, although the 1961 census is available, this state's reserved seats continue to be based on the 1951 census. Between 1971 and 1976, although the 1971 census is available, the reservations are based on 1961 census figures. Between 1977 and 2000, reservations continued to be based on 1971 census figures–even after the 1981 and 1991 censuses become available–due to the 42nd Amendment of 1976 suspending new delimitations until after 2000.[12] Additionally, since population is changing year to year, the current minority population share is in general different from both the minority population share measured in the last census and the share of seats reserved. Thus, it is possible to control for minority population share in the current year as well as in the most recent census and still identify the effect of share of seats reserved for minorities.

Modifying Equation 1 to address the problem of omitted minority population share, we get:

$$y_{st} = \alpha_s + \beta_t + \gamma Minority\ Rep_{st} + \delta_1 Current\ Pop_{st} + \delta_2 Census\ Pop_{st} + \lambda X_{st} + e_{st} \quad (2)$$

where $Current\ Pop_{st}$ is the minority share of the population in state s at time t and $Census\ Pop_{st}$ is the minority share of the population in state s at the time of the last preceding census.[13] In some of our estimated regression models below, we will also control for some additional variables, X_{st} (specifically, per capita state income last year, dummy for election year, population density in last preceding census, rural share of population and total population).

[12]This was discussed in Section 2.2.

[13]For the census years in our sample, i.e., t=1961, 1971, 1977, 1981 and 1991, the $Current\ Pop_{st}$ is identical to $Census\ Pop_{st}$. Although 1977 is not technically a census year, it was the year where SC/ST population shares based on the 1971 census were revised pursuant to the Scheduled Caste and Scheduled Tribe Orders Act of 1976. This was described in Section 2.2.

4 Data

We implement our empirical strategy using state panel data on the sixteen major Indian states covering the period 1960-2000.[14] These are the states that existed in India following the States Reorganization Act of 1956, which divided India into linguistic-based states.[15] These states contain 95% of the Indian population during the period of study.[16] The state is an appropriate unit of analysis for the research question at hand–the state legislature is making decisions about resource allocation and policies, and we are asking whether minority representation in the legislature affects poverty through these decisions.[17] In total we have 627 state-year observations.[18]

The variables used in our empirical analysis are gathered from various Indian government sources. We describe these variables below. Basically, our data set is the same as the one used in Pande (2003) but updated to 2000 and with poverty data added.[19]

Poverty outcomes: Our primary measure of poverty is the headcount ratio, which is the proportion of the population below the poverty line. To capture intensity of poverty, we use two additional measures: the poverty gap index (which is headcount ratio multiplied by the mean percentage shortfall of consumption from the poverty line among the poor) and squared poverty gap index (which is a variant of the poverty gap index that gives even more

[14]These states are Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

[15]There were thirteen states defined under this act, but in 1960 the state of Bombay was divided into Gujarat and Maharashtra, and in 1966 Punjab was divided into Haryana and Punjab.

[16]Excluded from our analysis are the union territories defined in the States Reorganization Act of 1956, which do not have the same degree of autonomy from the central government as the states. Some of these union territories have since attained statehood.

[17]Even with microdata, the policy variable remains at the state-time level. However, microdata would permit greater exploration of heterogeneity of effects, which could be a worthwhile future exercise.

[18]With 16 states and 41 years, there are 656 potential state-year cells. We lose 29 cells due to the following. First, Haryana and Punjab enter the data set in 1967; before 1967, Haryana was part of Punjab so Punjab pre-1967 had different borders and population than post-1967. Second, Gujarat and Maharashtra enter the data set in 1962; though formed in 1960, data on elections (and so, reserved seats) is first available in 1962. Finally, for Jammu and Kashmir, 1962 is the first year when data on elections (and so, reserved seats) is available, and poverty data is not available after 1991.

[19]We thank Rohini Pande for providing us the data and Stata code used in her paper.

weight to very poor).[20] The World Bank, as part of its India Poverty Project, provides a consistently defined data series on headcount ratio, poverty gap index and squared poverty gap index using household-level consumption expenditure data from the National Sample Survey (NSS).[21] The poverty measures for the 1960-2000 period are based on 25 rounds of the NSS.[22] In constructing the measures, Ozler et al. use the same poverty line used by the Government of India–the nutritional norm of 2400 calories per capita per day for rural areas and 2100 calories per capita per day in urban areas.[23] Individuals in households where the per capita expenditure level is insufficient to meet the calorie norms are classified as in poverty.[24] The headcount ratio, poverty gap index, and squared poverty gap index are measured separately for rural and urban areas of each state; more than 70% of the Indian population lives in rural areas.

There are alternative ways to measure poverty, but we argue that for our analysis, the headcount ratio, poverty gap index and squared poverty gap index from Ozler et al. are especially relevant. They are calculated in the same way as figures used by the Government of India. Thus, these are the figures used for planning purposes and reported by the media in India. To the extent that politicians are held accountable for poverty outcomes, it would be these measures of poverty that would be available and used. Besley and Burgess (2000)

[20]These three measures belong to the Foster, Greer and Thorbecke (1984) class of poverty measures. Whereas headcount ratio measures the incidence of poverty, poverty gap index and squared poverty gap index capture the intensity of poverty by giving individuals farther below the poverty line more weight. For the squared poverty gap index, each individual's poverty gap index is being weighted by the individual's shortfall of expenditure from the poverty line. As Deaton and Dreze (2002) note, this measure, unlike poverty gap index, is sensitive to the distribution of income below the poverty line, which is a desirable feature for a poverty measure. However, it is more sensitive to measurement error at the bottom of the income distribution.

[21]Ozler, Datt and Ravallion (1996) provided data on all three measures to 1994. Gaurav Datt provided headcount ratio data to 2000 via personal communication, for which we are grateful. These World Bank poverty data are also available from the LSE's EOPP website.

[22]NSS surveys were conducted in the years 1960, 1961, 1962, 1963, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1973, 1974, 1978, 1983, 1987, 1988, 1990, 1991, 1992, 1994, 1995, 1996, 1997, 2000. Following Besley and Burgess (2000), we used weighted interpolation to obtain the poverty estimates for years when no NSS survey was conducted. Our results remain when we restrict analysis to those years with NSS surveys, as we show in Section 5.2.

[23]These norms were set by the Planning Commission (1993).

[24]The expenditure level to meet the calorie norms varies by sector (urban/rural), state and year. See Datt (1995) for the details in constructing the poverty measures in Ozler et al.

also used the poverty measures from Ozler et al. in their study of the effect of states' land reform policies on poverty in India. As well, Burgess and Pande (2005) used them in their study of the effect of increasing access to banking on poverty in India.

Minority political reservation: We measure minority political reservation as follows: (1) percentage of seats in state assembly reserved for SC ("SC Share Reserved"); and (2) percentage of seats in state assembly reserved for ST ("ST Share Reserved"). We obtained information on the share of seats reserved for SCs and STs from the Election Commission of India reports on state elections. The Election Commission is an independent agency set up in the Indian Constitution to conduct elections, and is the authoritative source on data related to elections. These reports contain constituency-level data for each state election, including information about which seats are reserved for SCs and STs. We obtained useful institutional details about minority political reservation from the Scheduled Caste and Scheduled Tribe Commissioner's Office's annual reports and conversations with officials in that office.

Minority population share controls: To estimate Equation 2, we require data on the SC and ST share of the population according to the last preceding census and to current population estimates. Censuses of the population are taken decennially, and we use data from the following censuses: 1951, 1961, 1971, 1981, 1991 and 2001 (Census of India, Registrar General). Intercensal estimates of the population are obtained via linear interpolation, as in Pande (2003).[25]

Other controls: In some specifications, we control for state income last year, dummy for election year, population density in last preceding census, rural share of population and total population. First, the state income measure we use is the log of real per capita net state domestic product. The data source is the Planning Commission, Government of India.[26]

[25]Specifically, for a given population variable (e.g., total population, SC population and ST population), we calculate the constant annual growth rate needed for the observed initial census value to reach the observed terminal census value. Since we are projecting SC, ST and total populations separately, we are allowing differential population growth rates across social groups. This interpolation method does not model the underlying sources of population changes, and assumes smoothness in the evolution of population.

[26]We downloaded the data on income and deflators, which were used in Besley and Burgess (2000), from the EOPP website.

Second, a dummy variable for election year takes on the value one when there is a state election in year t. This information comes from the Election Commission's reports on state elections. Third, total population count comes from the Census of India, Registrar General, with intercensal estimates interpolated (using the same procedure described above for the minority population). Fourth, population density is computed as the total population in the state according to the last preceding census divided by total land area of the state. Finally, rural population share comes from Ozler et al. and is computed from the National Sample Survey.

The means and standard deviations of the variables used in our estimation below are reported in Table 2.

5 Estimation Results

5.1 Main Results

We first estimate the effect of minority political reservation on the headcount ratio, i.e., the percentage of the population living below the poverty line. These results are presented in Table 3. Each column reports the results from a separate regression estimated using ordinary least squares. The dependent variable is rural headcount ratio in Columns 1-3, urban headcount ratio in Columns 4-6 and aggregate (rural and urban combined) poverty in Columns 7-9. Standard errors are clustered by state.[27]

Column 1 shows the results from estimating Equation 1, where Equation 1 has been modified to allow for reservations for two disadvantaged minority groups: Scheduled Castes ("SC Share Reserved") and Scheduled Tribes ("ST Share Reserved"). The coefficient for SC Share Reserved is 0.56 and the coefficient for ST Share Reserved is -1.13 and neither is significant with 95% confidence. As discussed in Section 3, estimates using Equation 1 may be

[27]Though the policy variables are at the state-time level, it is desirable to cluster by state because serial correlation may be present (Bertrand, Duflo and Mullainathan, 2004).

biased due to omitted variables bias–minority population share is positively correlated with share of seats reserved due to the policy rule, and could be correlated with poverty as well. In Columns 2-3, we therefore estimate Equation 2 (modified to allow for two minority groups), which controls for population share of SCs and STs in the last preceding census as well as the current year. Equation 2 is our preferred specification, exploiting only the variation in minority political reservation that arises from national policies that cause reservations to be revised and the time lags with which the revised reservations are implemented due to the timing of state elections. In Column 2, the effects of SC and ST reservation are similar to Column 1's after controlling for census and current population shares of SCs and STs in the state. In Column 3, we add a few variables that might be correlated with both the reservation variable and the outcome: state income last year, election year dummy, total population, population density and rural share of population. We find that SC reservation has no impact on the incidence of poverty in rural areas, but ST reservation has a negative and significant effects. In particular, a one percentage point increase in seats reserved for STs in the state legislative assembly would lead to a 1.2 percentage point decrease in the rural poverty rate in the state.

Columns 4-6 show the parallel results with urban headcount ratio as the dependent variable. In Columns 5 and 6, which control for census and current population shares of SCs and STs, we find negative point estimates, but they are not significant with 95% confidence.[28] Thus, there is some weak evidence of a reduction in the incidence of poverty in urban areas due to minority political reservations.

Not surprisingly given our findings for rural and urban headcount ratio, in Columns 7-9 we find that SC reservation does not affect aggregate poverty but ST reservation reduces it. In particular, a one percentage point increase in seats reserved for STs in the state legislature would lead to a 1.1 percentage point decrease in the aggregate poverty rate in the state.

Besides the impact of minority political reservation on the incidence of poverty, the impact

[28]In Column 6, the coefficient for ST reservation is significant at the 10% level.

on the intensity of poverty is also of interest. In Table 4, we show the effects on poverty-gap index (Columns 1-4) and squared poverty gap index (Columns 5-8). In both rural and urban areas, ST reservation reduces the depth of poverty (measured by the poverty gap index) and the severity of poverty (measured by squared poverty gap index). This is suggestive that ST reservation did not only bring people just below the poverty line across it. It also appears to have helped those further below the poverty line.

It makes sense that ST reservation would have a much larger impact in rural areas than urban areas. Over 90% of the ST population resides in rural areas, and the ST poverty rate is 47% in rural areas compared to 33% in urban areas, so we might expect that efforts to improve ST well-being would be focused on rural areas.[29] Perhaps the surprise is that ST reservation should reduce urban poverty at all. However, even in cities the STs tend to live in pockets together, making them possible to target aid to. Moreover, it could be that the urban poor–both from minority and non-minority groups–are benefiting from the general poverty reduction policies that ST state legislators tend to push. It is likely that the poor in non-ST social groups experience some benefits because otherwise the effect on ST poverty in urban areas seems quite large.[30]

To summarize, the main result of this paper is that minority political reservation reduced poverty in India. Specifically, we find that reserving more seats for STs significantly reduces the incidence and intensity of poverty in rural and urban areas. We do not find a significant effect of SC reservation on any of our poverty measures, though we cannot rule out a modest negative effect on the urban poverty rate. Though the estimates are somewhat imprecise, generally we find that the effects of ST reservation is statistically significantly different from

[29]The figures are based on 2004-05 National Sample Survey data.

[30]For example, in 2004-05, though one-third of urban STs are poor, urban STs account for less than 4% of the urban poor. The point estimates in Table 3 suggest that a one percentage point increase in reserved seats for STs leads to a 0.4 percentage point reduction in the urban poverty rate. If this effect came entirely from reductions in ST urban poverty, then 10% of the ST urban poor would be exiting poverty. Alternatively, ST urban poverty decreases by less with poverty for other groups declining also.

the effects of SC reservation.[31]

Our findings are consistent with Pande (2003). She found that ST political reservations in the state legislature significantly raised spending on ST welfare programs while SC political reservations are associated with more state government jobs reserved for minorities; ST reservation did not affect job reservations and SC reservation did not affect spending on SC welfare programs. More spending on ST welfare programs would tend to reduce poverty more, especially in rural areas (since over 90% of STs live in rural areas). On the other hand, more public sector jobs for minorities would tend to help the better off more (though there are some unskilled government jobs, most require skills that the poor are less likely to possess), so there would be less impact on the poverty margin. Of course there are numerous channels through which representation in the state assembly could affect poverty, and the policies analyzed by Pande are only a subset, but even looking at this subset we can see why ST reservation might be more likely to reduce poverty, especially rural poverty, while SC reservation might not have a measured effect on poverty.

Thus, the findings from our study and Pande collectively suggest that one channel through which minority reservation in state legislative assemblies affects poverty is changing state policies. Although gaining a seat or two clearly does not change the fact that SC/ST state legislators lack votes for unilateral action (i.e., the median voter in the state legislature is still a non-SC/ST), it may effect policy change through increasing SC/ST political voice and perhaps also their value to non-minority legislators for purposes of forming coalitions. It is interesting why SC and ST reservation is associated with different policy changes and poverty effects, and we investigate this more in Section 5.3.

[31] In Tables 3 and 4, the last line displays the results of F-tests of the equality of the effects of ST and SC political reservation.

5.2 Robustness Checks

We have been interpreting the estimated coefficient for the minority political reservation variable in Equation 2 as the causal effect of minority political reservation. The foundation for this causal interpretation is that we are only using within-state cross-time variation in seats reserved arising from national policies that cause reservations to be revised and the time lags with which revised reservations are implemented. In this subsection, we consider several hypotheses that would confound a causal interpretation.

Control for nonlinear effects of minority population share: Our identification strategy is a regression-discontinuity-type approach in the sense that share of seats reserved for minorities in the state assembly is a discontinuous function of their population share in the state. Thus it is essential to control adequately for minority population share so that identification is solely from the discontinuities. In our preferred specification (Equation 2), we controlled linearly for minority population share in the last census as well as in the current year. This leaves open the possibility that we are incorrectly attributing some nonlinear effects of minority population share to minority political reservation. We address this concern in the following three robustness checks. To preview these results, we find our results remain even when we control for more complex functional forms for minority population share.

First, we augment Equation 2 with quadratic controls for SC and ST population share in the last preceding census. The estimated effects of ST Share Reserved and SC Share Reserved for this specification are shown in Table 5, Column 2 (Column 1 reports the results of the original specification, which were previously shown in Table 3, Columns 3, 6 and 9, to facilitate comparison). The effects are the same as before: there is no effect of SC Share Reserved on any of the poverty measures, and ST Share Reserved has a negative significant effect.

Second, we add to Equation 2 one and two-year lagged values of current population share

of SC and ST for each state. These estimated effects, shown in Column 3, are essentially unchanged from the baseline effects in Column 1.

Finally, we restrict our sample to a narrower window around the discontinuous points, i.e., election years in which revised reservations are first implemented. Specifically, we only use observations two years before, during and after such an election year in the state. The results are displayed in Column 4. Despite the reduction in number of observations (195 instead of 616), the coefficients are similar in magnitude and precision.

Restrict to years with NSS data: Our poverty measures are constructed based on 25 rounds of NSS data. The poverty measures are interpolated for years when NSS data are not available. This will tend to cause measurement error in the dependent variable. If this were classical measurement error, then our estimates would be consistent though less precise. However, it is possible that there is nonclassical measurement error such that the estimates might not even be consistent. To address this concern, we drop the years for which the poverty estimates were interpolated: 1964, 1972, 1975, 1976, 1977, 1979, 1980, 1981, 1982, 1984, 1985, 1986, 1989, 1993, 1998 and 1999. The results using this smaller sample are shown in Column 5. The estimated effects are similar to the original ones. Thus, the effects of minority reservation that we estimate are not mere artifacts of using some interpolated data.

5.3 Why Might the Effects of SC and ST Reservation Differ?

It intriguing that SC and ST political reservation have different impacts on poverty, and in this subsection we explore some potential reasons for this. In particular, we consider the following differences between SC and ST communities: (1) STs tend to be more geographically isolated; (2) STs tend to live in more homogeneous communities; and (3) STs have more steadfast support for the Congress Party. Since most Indians live in rural areas and most of the estimated reduction in poverty is in rural areas, we only display estimation results using rural headcount ratio as the outcome. As a caveat to these results, we note

that this analysis is crude (and is meant to be suggestive rather than definitive), and there could be a variety of other explanations for the differential effects.

Geographic isolation: STs are more geographically isolated than SCs. STs are more likely to live in local communities concentrated with other STs.[32] SCs, though, are fairly evenly distributed throughout the state, and rarely comprise a majority in their local communities. The geographic concentration of STs may facilitate the targeting of resources toward them (i.e., provide resources to STs without much slippage to other social groups). For example, it could be effective to provide aid to the entire community without effort singling out which households qualify for the aid.

To assess this story, we allow the effects of reservation to differ by an index of isolation. We follow Cutler, Glaeser and Vigdor (1999) and use the the standard index of isolation– which gives the probability that the average minority in a particular geographical area (they use US city, we use Indian state) will meet another minority–adjusted for the prevalence of minorities in the area.[33] We apply this to district level data on the rural population from the 1971 census.[34] On average in the 16 states, the unadjusted index of isolation for both SCs and STs is 0.19, which means that for a member of either minority group, there is a 19% chance a randomly drawn person from the district he/she resides in will be of the same group. However, SCs comprised 15% of population and STs comprised only 8%, so a 19% meeting probability implies very different things for each group; apparently, the STs are more segregated because they are more than twice as likely to meet than if STs were uniformly distributed across the districts within each state. The adjusted index of isolation is 0.03 for SCs and 0.11 for STs, capturing the greater isolation of STs relative to SCs (a value of zero represents no isolation).

[32]Though STs account for about 8% of the overall population, they often account for a majority of the population in their local communities.

[33]For each state s, this is: $\Sigma_d popshare_d * minshare_d$-$popshare_s$ where $popshare_d$ is the minority group's share of total population in district d, $minshare_d$ is district d's share of the total minority population in the state, and $popshare_s$ is the minority share of total population in state s.

[34]We thank Rohini Somanathan for providing us with these data, which were part of the data set for Banerjee and Somanathan (2007).

In Table 6, Column 2, we estimate Equation 2 adding interactions between minority reservation and the adjusted index of isolation.[35] The coefficients for the interaction terms are not significant, and the effects of SC and ST reservation are basically unchanged from the original specification (of which results are reported in Column 1). This does not support our hypothesis that the differential effects of SC and ST reservation are due to the greater isolation of STs. However, literally what we have found is that within-group increases in isolation does not change the effect of the group's reservation; it remains possible that cross-group differences in effects are due to cross-group differences in isolation. Additionally, it could be that the district is too large an area to use for forming the isolation measures; perhaps residential segregation at a more local level are more relevant for thinking about how aid and public goods are distributed. Thus, while it might be premature to discard the differential isolation story, we do not find direct evidence of it here.

Social heterogeneity: Within a local community, members of STs tend to be from the same specific scheduled tribe whereas there is more within-group heterogeneity among members of SCs (even in a given locality, there are numerous castes and subcastes within SCs). The greater homogeneity within the local community among members of STs may improve the efficacy of these resources (e.g., more cooperative outcome, better delivery) (Alesina, Baqir and Easterly, 1999; Miguel and Gugerty, 2005).

To assess this story, we allow the effects of reservation to differ by caste fragmentation. We use the district caste fragmentation measures from Banerjee and Somanathan (2007), and population weigh them to the state level.[36] Thus, we have a measure of local social heterogeneity among Hindus for the average person in the state. As Somanathan and Banerjee

[35]Note the main effect of the index of isolation is absorbed by the state fixed effects.

[36]We thank Rohini Somanathan for providing us with these data. Banerjee and Somanathan (2007) use a social group fragmentation measure that includes not only the Hindu castes, but also other religious groups. We are primarily interested in measuring heterogeneity among Hindus so we use the caste fragmentation measure. Banerjee and Romanathan use 1931 census data, which is the last census providing detailed caste information for the population, and apply the standard fractionalization index for each district as follows: $1\text{-}\Sigma_c popshare_c^2$ where $popshare_c$ is the population share of the cth caste. Given the sheer number of caste groups, they restricted analysis to castes that form at least 1% of the population of each state, leaving them with 185 caste groups.

noted, India has a great deal of social heterogeneity; on average in the 16 states, the index is 0.93, compared to 0.29 calculated by Alesina, Baqir and Easterly (1999) for US cities using racial groups.

In Table 6, Column 3, we estimate Equation 2 adding interactions between minority reservation and caste fragmentation.[37] It appears that increasing caste fragmentation reduces the effectiveness of SC reservations in fighting poverty–the coefficient for the interaction is positive and significant. However, caste fragmentation does not significantly affect ST reservation's impact on poverty; this makes sense because STs are typically not part of the Hindu caste system, so ST state legislators should not be materially adversely affected by caste fragmentation. Thus, while SC reservations may be effective at getting more resources for SCs (as previous studies have documented), there may be more contention over where these resources should go because of the greater social heterogeneity. Since it is the better off among the SCs who tend to win the seats reserved for SCs (Dushkin, 1972), more resources allocated in favor of SCs may end up going to the better off among the SCs (e.g. positions as heads of ministries, government jobs, scholarships), so poverty decreases by less (if at all) due to SC reservation. These results, thus, appear supportive of the idea that social heterogeneity may in part be responsible for the differential effects of ST and SC reservation.

Support for the Congress Party: Motivated by Banerjee and Somanathan (2007), who find that changes in SC/ST support for the Indian National Congress Party can help explain the differential impact of SC/ST population share on public good access, we consider the role of support for the Congress Party.[38]The Congress Party has historically been the dominant party in Indian politics, though in recent decades has faced increasing competition. The decline in support for the Congress Party has been especially pronounced among SCs.[39]

[37]Note the main effect of the caste fragmentation variable is absorbed by the state fixed effects.

[38]In particular, they find using constituency level data from 1971 and 1991 that increases in SC population share increase access to public goods like health facilities, high schools and piped water, but increases in ST population share did not. Analysis suggests that these effects can in part be explained by SCs' relative decline in support for the Congress Party, which has been coupled by increasing support for parties catering to SCs.

[39]For example, Banerjee and Somanathan (2007) report that SCs won 68% of Parliament seats reserved

The Congress Party has a strong stated anti-poverty stance which originated in the 1971, when Indira Gandhi campaigned for Prime Minister with "Garibi Hatao" (Abolish Poverty) as her slogan and won re-election. Thus it seems natural to ask whether the larger effect of ST reservation on poverty that we find might be related to STs' more steadfast support for the Congress Party.

To assess this story, we estimate Equation 2 adding interactions between minority reservation and support for Congress. We use two measures of support for Congress, both based on the share reserved seats won by the Congress Party in the lower Parliament (Lok Sabha).[40] One measure is simply the share of SC (ST) reserved seats won by Congress, and a second is a dummy indicating whether the share is at least 50%. We display the results in Table 6, Columns 4 and 5. A couple of things are interesting to note. First, the effect of Congress Party share of Parliament seats on rural poverty is negative, and significant at least at the 10% level, which corroborates with the idea that increased support for Congress party is associated with lower poverty.[41][42] Second, the interaction effects are positive for SC reservation but negative for ST reservation so there is not a simple story. When looking at Column 5 with the Congress Party majority measure, we find that the coefficient for the interaction between ST reservation and Congress support is negative; this is consistent with the idea that ST reservation is more effective at reducing poverty where there is high support for Congress.[43] On the other hand, when looking at Column 4 with the continuous Congress

for SCs in 1971 but only 41% in 1991; in contrast, STs won 77% of Parliament seats reserved for STs in 1971 and 67% in 1991. There is variation in changes in SC and ST support for the Congress Party across states though.

[40]We compiled a state-time panel of total Parliament seats, SC reserved seats and ST reserved seats both overall and won by the Congress Party from reports of results for general elections held 1962-1999 published by the Election Commission of India.

[41]For Column 4, the coefficient for "Congress Party share of all Parliament seats" is -0.085 (s.e.: 0.0.32) and for Column 5, the coefficient for the dummy "Congress Party has at least 50% of all Parliament seats" is -3.300 (s.e.: 1.647). We have not reported these main effects in Table 6 to conserve space.

[42]Of course it should be recognized that election outcomes could be endogenous so these this may not have a causal interpretation. It could be that having more Congress members in Parliament reduces poverty more (because, say, Congress allocates more resources for fighting poverty than other parties), but it could also be that Congress candidates are more likely to get elected when the economy is better (poverty is lower).

[43]Though, see previous footnote.

Party share of seats measure, the interaction between SC reservation and Congress support is positive and significant. What may be key is that for SCs and STs, different alternative political parties are available, with SCs having more parties catering to their interests. Perhaps given the existing political landscape, the best STs can do is go along with the Congress Party–at least there would be some reduction in poverty; in a counterfactual world where there are more parties catering to STs, perhaps supporting Congress would not reduce poverty as much as supporting those new parties.

5.4 Reservation in State Legislative Assemblies After the 73rd and 74th Amendments

In April 1993, the 73rd and 74th Amendments to the Indian Constitution came into effect, which formalized local government institutions and devolved more power from the state to local governments. These reforms also stipulate that one-third of local elected offices be reserved for women, and the reserved seats for SCs and STs be in proportion to their population. In practice, government continues to be highly centralized in India, but local governments have typically been given the authority to select beneficiaries for government welfare programs and to allocate funds for building and maintaining local infrastructure (Duflo, 2004; Besley, Pande, Rahman and Rao, 2004). The devolution of power and introduction of reservation to local governments could change the way SC and ST reservation in the state assemblies affect poverty. It could lead to greater reductions in poverty because local leaders know better than state bureaucrats about which households are in direst need and what public goods are most useful. On the other hand, decentralization could lead to local elite capture, which could worsen poverty (e.g., Johnson, Deshingkar and Start, 2005); having benign state bureaucrats make resource allocation decisions may serve the poor better than giving the local elites the power.

We test for whether the effect of reservation in the state legislative assemblies changed

after the devolution of power in two ways. Our first exercise is simply to allow the effect of reservation to vary before and after 1993, when the amendments became law. Not all states implemented the reforms immediately, and so as a second exercise we allow the effect of reservation to vary before and after the first Gram Panchayat (village council) election in the state after 1993.[44]

In Table 6, Column 6, we estimate Equation 2 adding interactions between minority reservation and a dummy for 1993 and later.[45] We find that SC reservation has no impact on rural poverty incidence either before or after 1993. However, ST reservation causes a larger reduction in rural headcount ratio after 1993; the pre-1993 and post-1993 effects are different from each other at the 5% significance level. In Table 6, Column 7, we estimate Equation 2 adding interactions between minority reservation and a dummy for year of the first local election and later. The results are as in Column 6, though now the pre/post-reform effects are different only at the 15% significance level. These results are suggestive that that the 73rd amendment (which applied to rural governing bodies) enhanced the ability of ST reservations in the state legislature to fight poverty.[46] The devolution of power, and mandated minority representation in local governing bodies, perhaps improved targeting and made the STs preferences more salient, leading to an ultimate resource allocation that was more effective at reducing rural poverty.

Why doesn't devolution of power, and mandated minority representation in local government bodies, enhance the ability of SC reservation in the state legislature to fight poverty as well? It must be pointed out that there is nothing to enhance–SC reservation in the state legislature does not appear to redirect resources in a way that reduces poverty. It could

[44]This approach is attractive in the sense that only after the first election is the local government with the new reservations and new responsibilities in place. However, the timing of the first local election is potentially endogenous.

[45]For this analysis, we drop Jammu and Kashmir because we have no poverty data for this state in the after period. In fact, results do not change if we include this state's observations.

[46]We must use caution in interpreting these results. Our data set ends in 2000, leaving only seven years of post-1993 observations. The local governments are still a work in progress, and we do not know if the shorter run effects will apply in the longer run. Moreover, many changes have occurred in India since 1993 besides the passage of the 73rd and 74th Amendments.

be that with or without the promise of more effective targeting at the local level, SC state legislators (for whatever reasons, including what we discussed in Section 5.3) do not pursue policies and spending decisions that help people near the poverty line. Alternatively, it could be that SC state legislators would undertake more anti-poverty actions if they could be assured there would not be mistargeting, but they believe local elite capture could undermine the potential benefits of decentralization.

6 Discussion

This paper is the first to quantify the effect of an affirmative action policy on poverty, and among the few to estimate an overall effect of an affirmation action policy (i.e., not only the effect on the intended beneficiaries). We used a natural experiment in India to identify the effect of political reservations for disadvantaged minority groups on overall poverty. The Indian Constitution stipulates that the number of seats reserved for Scheduled Castes and Scheduled Tribes in the state legislative assemblies must be in proportion to each group's share of the state population as enumerated in the most recent census. There is a time lag, though, between when reservations are revised (say, due to the arrival of a new census count) and when the revised reservations get implemented due to the staggered timing of state elections. This permits the identification of the effect of minority political reservation while controlling for minority population share since the former is a discontinuous function of the latter. Applying this empirical strategy to panel data on Indian states for 1960-2000, we find that SC political reservation had no impact on poverty while ST political reservation reduced both the incidence and intensity of poverty. Increasing the share of seats reserved for STs by one percentage point reduced poverty in India by 1.1 percentage points. Much of the reduction is in rural areas; a one percentage point increase in ST reservation lowers rural poverty by 1.2 percentage points and urban poverty by 0.6 percentage points.

This paper provides evidence that, contrary to widespread belief, the benefits from af-

firmative action are not always captured by the better off. Indeed, in the case of political reservation for STs in India, the poor–including those far below the poverty line–have benefited too. Thus, minority political reservation is a policy that is both pro-minority and pro-poor.

Given the net reduction in poverty, likely there was redistribution from richer to poorer.[47] But governments routinely engage in income redistribution, which is perceived as far less controversial than redistribution from one ethnic group to another. Assuming that non-minorities gain no more than minorities (which seems reasonable given the previous studies showing the reservations lead to resource reallocations in favor of the targeted group), the political reservation policy generated more gains to minorities than losses to non-minorities. It is even possible that both minorities and non-minorities gain (e.g., because ST legislators strongly promote anti-poverty programs). So though we cannot rule out that there is redistribution from non-minorities to minorities, we can say that it does not appear to be the non-minorities near the poverty line who are bearing the expense for the minorities' gains (for if they were, overall poverty would not have declined). Moreover, given that there are net gains for the policy, it should be possible to offer compensation to any non-minorities near the poverty line who are made worse off.

The empirical evidence in this paper suggests that the effects of affirmation action policies estimated in one context may be hard to generalize to other contexts. We found that while political reservations for one social group, the STs, did help reduce poverty, political reservations for another similarly impoverished group, the SCs, did not.[48] This mirrors a finding from Prakash (2008), who estimates the effects of reserving government jobs for dis-

[47]Minority political reservation might generate efficiency gains which could help reduce poverty even without income redistribution. Duflo, Fischer and Chattopadhyay (2008) suggested one way minority political representation could increase efficiency–it increases information about preferences of minorities, leading to a more optimal allocation of resources earmarked for minorities. There are other mechanisms. For example, it could end a nutrition-based (or more generally, a human-capital-based) poverty trap. This means that providing extra consumption to people below poverty has higher returns than providing the same extra consumption to richer people.

[48]SC political reservation may nonetheless be beneficial to SCs and other social groups, but just not in terms of reducing poverty.

advantaged minorities on their employment outcomes in India–SC job reservations help the SCs, but ST job reservations do not appear to help the STs. This is also consistent with Pande (2003), who finds that SC political reservation changed policies in different ways than ST political reservation. The preferences of SCs and STs differ, and some of the constraints that they face differ too, and these differences have implications for the effects of affirmative action policies. Given this, it seems useful to state clearly what are the objectives of affirmative action so that the appropriate policies can be designed to meet these objectives; broad stroke affirmative action policies are unlikely accomplish them for all groups.

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TABLE 1

Legislation Affecting Share of State Legislative Assembly Seats Reserved for SCs and STs during 1960-92

Name of Legislation	Year First Implemented	Explanation
Two-Member Constituencies Abolition Act 1961	1962	Two-member territorial constituencies abolished
Punjab Reorganization Act 1966	1967	Reorganization of Haryana and Punjab
Delimitation Commission Act 1962	1967	Revised in line with 1961 census count
Delimitation Act 1972	1974	Revised in line with 1971 census count
Scheduled Caste and Scheduled Tribe Orders Act of 1976	1977	Definitions of SCs and STs made uniform within a state, leading to official revisions of 1971 census SC and ST population counts

TABLE 2
Descriptive Statistics

Variable	Mean	Standard Deviation
Poverty Outcomes (%):		
Headcount ratio (Aggregate)	46.47	(13.93)
Headcount ratio (Rural)	48.28	(14.75)
Headcount ratio (Urban)	39.97	(13.90)
Poverty gap index (Rural)	14.60	(6.22)
Poverty gap index (Urban)	12.22	(5.63)
Squared poverty gap index (Rural)	5.87	(3.18)
Squared poverty gap index (Urban)	4.86	(2.83)
Minority Political Reservation (%):		
SC share reserved	14.12	(5.36)
ST share reserved	7.43	(7.72)
Minority Population Share Controls (%):		
SC census population share	14.56	(5.54)
ST census population share	7.59	(7.54)
SC current population share	14.65	(5.60)
ST current population share	7.56	(7.48)
Other Controls:		
Log of state income per capita last year	6.98	(0.39)
Election dummy	0.23	(0.42)
Population density	260.71	(170.01)
Rural population share (%)	77.96	(8.14)
Total population	4.30e+07	(2.87e+07)

Notes: State-year data for the 16 major Indian states from 1960-2000 as described in Section 4. There are 627 observations for all variables except state income last year, poverty-gap index, and squared poverty-gap index. State income last year has 616 observations because the state income data series does not begin until 1960. Poverty gap index and squared poverty gap index have 537 observations because they are available only 1960-1994.

TABLE 3

Effect of Minority Political Representation on Incidence of Poverty

	Headcount Ratio								
	Rural			Urban			Aggregate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SC Share Reserved	0.561	0.806	0.439	−0.303	−0.401	−0.448	0.462	0.648	0.335
	(0.681)	(0.818)	(0.741)	(0.411)	(0.357)	(0.354)	(0.600)	(0.686)	(0.573)
ST Share Reserved	−1.127	−1.067	−1.242**	−0.513	−0.385	−0.606*	−1.026	−0.890	−1.106**
	(0.690)	(0.759)	(0.543)	(0.413)	(0.451)	(0.338)	(0.635)	(0.700)	(0.495)
SC Census Pop Share		−0.563	0.947		−0.605	0.121		−0.768	0.592
		(1.056)	(0.750)		(0.545)	(0.895)		(0.736)	(0.583)
ST Census Pop Share		0.166	0.115		−0.363	−0.242		0.137	0.150
		(0.998)	(0.824)		(0.521)	(0.352)		(0.901)	(0.686)
SC Current Pop Share		−1.176	−1.443		2.008**	1.830*		−0.314	−0.597
		(0.972)	(1.143)		(0.705)	(0.985)		(0.730)	(0.938)
ST Current Pop Share		0.095	−0.020		−0.069	−0.355		−0.152	−0.303
		(1.047)	(0.747)		(0.699)	(0.548)		(0.907)	(0.605)
State Income Last Year			−20.381***			−0.252			−16.254***
			(4.131)			(2.607)			(3.543)
Population Density			−0.073**			−0.045*			−0.065**
			(0.030)			(0.024)			(0.028)
Election Year Dummy			0.448			0.542			0.449
			(0.621)			(0.366)			(0.461)
Rural Population Share			0.755			0.527			0.732
			(0.684)			(0.526)			(0.567)
Total Population			$1.11e-07$			$1.73e-07$*			$1.38e-07$
			(1.05e-07)			(8.98e-08)			(9.35e-08)
State and Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
No of Observations	627	627	616	627	627	616	627	627	616
Adjusted R^2	0.81	0.82	0.86	0.90	0.91	0.92	0.85	0.86	0.89
p-value of F-test of equality of effects of SC and ST shares reserved									
	[0.097]	[0.061]	[0.037]	[0.709]	[0.974]	[0.720]	[0.107]	[0.085]	[0.029]

Notes: Standard errors clustered by state are in parentheses. "SC(ST) Census Pop Share" is the SC (ST) share of the state population according to the last preceding census. "SC(ST) Current Pop Share" is the SC (ST) share of the state population measured in the current year. Asterisks denote significance levels (*=.10, **=.05, ***=.01)

TABLE 4

Effect of Minority Political Representation on Intensity of Poverty

	Poverty Gap Index				Squared Poverty Gap Index			
	Rural		Urban		Rural		Urban	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
SC Share Reserved	0.352	0.168	−0.116	−0.218	0.207	0.119	−0.056	−0.127
	(0.285)	(0.249)	(0.133)	(0.161)	(0.130)	(0.110)	(0.072)	(0.089)
ST Share Reserved	−0.267	−0.336*	−0.420**	−0.471***	−0.091	−0.123	−0.248**	−0.242**
	(0.246)	(0.171)	(0.166)	(0.152)	(0.119)	(0.079)	(0.108)	(0.100)
SC Census Pop Share	−0.110	0.473	−0.528	−0.086	−0.035	0.259	−0.187	0.052
	(0.442)	(0.287)	(0.379)	(0.275)	(0.282)	(0.190)	(0.252)	(0.177)
ST Census Pop Share	−0.509**	−0.484**	−0.159	−0.015	−0.452***	−0.446***	−0.106	−0.033
	(0.238)	(0.170)	(0.273)	(0.222)	(0.118)	(0.092)	(0.185)	(0.141)
SC Current Pop Share	−0.205	−0.329	1.102**	0.885***	−0.002	−0.034	0.496*	0.367*
	(0.369)	(0.271)	(0.397)	(0.297)	(0.230)	(0.174)	(0.246)	(0.179)
ST Current Pop Share	0.524	0.496	0.267	0.119	0.454**	0.429**	0.240	0.170
	(0.332)	(0.298)	(0.335)	(0.246)	(0.198)	(0.191)	(0.189)	(0.139)
State Income Last Year		−6.622**		−0.153		−3.177*		−0.363
		(2.337)		(1.507)		(1.498)		(0.818)
Population Density		−0.035**		−0.028**		−0.020**		−0.015**
		(0.015)		(0.010)		(0.009)		(0.006)
Election Year Dummy		0.004		0.274		−0.079		0.147
		(0.234)		(0.178)		(0.099)		(0.098)
Rural Population Share		0.644**		0.782**		0.309*		0.496**
		(0.285)		(0.312)		(0.170)		(0.202)
Total Population		$3.67e-08$		$5.92e-08$*		$1.27e-08$		$9.99e-09$
		(6.04e-08)		(3.26e-08)		(3.75e-08)		(1.84e-08)
State and Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
No of Observations	537	526	537	526	537	526	537	526
Adjusted R^2	0.82	0.86	0.88	0.91	0.79	0.83	0.84	0.88
p-value of F-test of equality of effects of SC and ST shares reserved								
	[0.081]	[0.072]	[0.109]	[0.143]	[0.085]	[0.068]	[0.085]	[0.234]

Notes: Standard errors clustered by state are in parentheses. "SC(ST) Census Pop Share" is the SC (ST) share of the state population according to the last preceding census. "SC(ST) Current Pop Share" is the SC (ST) share of the state population measured in the current year. Asterisks denote significance levels (*=.10, **=.05, ***=.01)

TABLE 5

Robustness Checks

	(1)	(2)	(3)	(4)	(5)
PANEL A: *Rural Headcount Ratio*					
SC Share Reserved	0.439	0.282	0.461	0.048	0.479
	(0.741)	(0.708)	(0.719)	(0.515)	(0.687)
ST Share Reserved	−1.242**	−1.550***	−1.183*	−1.210**	−1.272**
	(0.543)	(0.381)	(0.569)	(0.548)	(0.528)
PANEL B: *Urban Headcount Ratio*					
SC Share Reserved	−0.448	−0.620	−0.452	−0.760	−0.332
	(0.354)	(0.443)	(0.354)	(0.450)	(0.317)
ST Share Reserved	−0.606*	−0.943**	−0.583	−1.030**	−0.469
	(0.338)	(0.371)	(0.355)	(0.451)	(0.373)
PANEL C: *Aggregate Headcount Ratio*					
SC Share Reserved	0.335	0.170	0.349	0.006	0.387
	(0.573)	(0.562)	(0.556)	(0.435)	(0.542)
ST Share Reserved	−1.106**	−1.436***	−1.059*	−1.122**	−1.097**
	(0.495)	(0.322)	(0.519)	(0.479)	(0.494)

Notes: Standard errors clustered by state are in parentheses. Results displayed in each panel-column come from a separate regression that also controls for state and time fixed effects, SC and ST population share in the last preceding census, and SC and ST current population share, state income per capita last year, election year dummy, total population, population density in last preceding census and rural population share. The regressions in each column have the following additional features:
Column (1) shows the estimates originally reported in Table 3, Columns 3, 6 and 9.
Column (2) adds as controls the square of SC and ST population shares in the last preceding census.
Column (3) adds as controls the SC and ST population shares one and two years ago.
Column (4) restricts the sample to those observations within a five-year window centered around elections in which the minority political reservation changed in the state.
Column (5) restricts the sample to years when NSS data was available.
The number of observations is 616, 195 and 365 in Columns 1-3, 4 and 5, respectively.
Asterisks denote significance levels (*=.10, **=.05, ***=.01)

TABLE 6

Heterogeneity in Effect on Rural Headcount Ratio

	Base	Isolation	Social Heterogeneity	Congress Support	Congress Support	73rd Amendment	73rd Amendment
Variable 1:		SC isolation %	Caste frag. %	SC Congress %	SC Congress majority	After 1993	After 1st local election
Variable 2:		ST isolation %	Caste frag. %	ST Congress %	ST Congress majority	After 1993	After 1st local election
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
SC Share Reserved	0.439	0.507	0.462	−0.227	−0.236	0.408	0.535
	(0.741)	(0.777)	(0.458)	(0.591)	(0.560)	(0.802)	(0.809)
ST Share Reserved	−1.242**	−1.275**	−1.221***	−1.197*	−1.180*	−1.239**	−1.257**
	(0.543)	(0.514)	(0.402)	(0.636)	(0.579)	(0.577)	(0.577)
SC Share Reserved x Variable 1		−0.024	0.258**	0.004**	0.046	0.202	0.520
		(0.133)	(0.092)	(0.002)	(0.107)	(0.272)	(0.327)
ST Share Reserved x Variable 2		0.049	0.179	−0.000	−0.202	−0.363**	−0.225
		(0.103)	(0.350)	(0.002)	(0.175)	(0.139)	(0.138)
Mean (s.d.) for Variable 1		2.954	93.472	52.383	0.597	0.205	0.131
		(3.820)	(3.769)	(39.956)	(0.491)	(0.404)	(0.338)
Mean (s.d.) for Variable 2		11.584	93.472	34.997	0.400	0.205	0.131
		(11.135)	(3.769)	(41.085)	(0.490)	(0.404)	(0.338)

Notes: Standard errors clustered by state are in parentheses. Results displayed in each column come from a separate regression that also controls for state and time fixed effects, SC and ST population share in the last preceding census, and SC and ST current population share, state income per capita last year, election year dummy, total population, population density in last preceding census and rural population share. In addition, the specification in Columns 4-5 control for Congress Party share of SC, ST and all Parliament seats, and that in Column 6 controls for a dummy indicating year after first local election. In Columns 2-4, components of interaction terms have been demeaned so the coefficient for SC (ST) Share Reserved gives the effect at the mean value of Variable 1 (Variable 2). Column (1) shows the estimates originally reported in Table 3, Column 3. The number of observations is 616, 600 and 586 in Columns 1-3, 4-5 and 6-7, respectively. Asterisks denote significance levels (*=.10, **=.05, ***=.01)

Figure 1
Illustration of Identification Strategy