

# The Distributional Consequences of Political Reservation

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## Abstract

We examine how political reservation in favour of socio-political minorities affects inequality in private wealth and access to public goods. We focus on across-group, within-group and within-sub-group distribution of outcomes. Using rich data on a range of public goods across 45,000 villages and private assets for nearly 20 million rural households across the Indian state of Bihar, we show that reservation for scheduled castes (SC) for the post of village-council heads: (a) changes the socioeconomic class of the incumbent village-head, but results in the selection of members from more wealthier sub-castes within SCs (b) improves asset-wealth outcomes for members of the head's sub-caste, especially those who live in close proximity to the head (c) worsens asset-wealth outcomes for the non-SC sub-caste that is most numerous (d) targets public goods towards the dominant SC-village within a village-council and not the head's own village. Using data on night-lights, we provide evidence to suggest that re-election incentives could potentially play a role in explaining our results. The impact of political reservation, thus, cannot be reduced to the simplistic binary of equity- or efficiency - improving: the web of winners and losers is more complex than previously characterized.

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# 1 Introduction

Affirmative action in the form of reserving posts (referred to as “reservation” in India) - public sector jobs or political positions - has been a contested reality in independent India. Indeed, these policies are both deeply entrenched and throw up constant demands for further expansion. This may be seen as a consequence of the continuing centrality of caste (and gender) in organizing social life and determining upward mobility. For its proponents, mandated *political* representation - the focus of this paper - is seen as an important way of restoring balance and ensuring that the interests of the less-privileged are represented in a democratic set up.

Caste-based reservation in India is made in favour of broad caste groupings that do not constitute a homogeneous whole. Indeed, these broad groupings - Scheduled Castes (SCs) or Other Backward Castes (OBCs), for instance – comprise several sub-castes, locally called *jatis*. These sub-castes display considerably heterogeneity in culture and practices. More important, *jatis* tend to largely be hierarchical, with those above considering themselves superior in birth to those below. Thus, reservation generates a tension, attempting to jointly prop up a broad caste grouping that is internally unequal. This tension makes it all the more important to go beyond the average effects on members across broad caste-groupings and focus on the distributional consequences, both across and (importantly) within these groupings.

The literature, thus far, has tended to largely focus on impact of political reservation on mean outcomes for in-group and out-group members of these broad categories ([Besley, Pande, Rahman, and Rao, 2004]; [Duflo, Fischer, and Chattopadhyay, 2005]). Recent work finds that political reservation for minorities in India causes negligible impact on mean outcomes for minorities ([Bardhan, Mookherjee, and Torrado, 2010]; [Dunning and Nilekani, 2013]; [Bhavnani, 2016]). A subset of papers - [Das, Mukhopadhyay, and Saroy, 2017] and [Anderson and Francois, 2017], to name two, recent ones - focus on measuring the impact of political reservation on more disaggregated groupings, but this literature is still nascent, with some open questions. It is this gap that we are looking to fill, by looking to delve deeper into the disaggregated, distributional consequences of political reservation across a very wide range of outcomes, including candidate selection, public goods and private assets.

The data for comes from the Indian state of Bihar, among India’s poorest states. In 2006, for the first time ever, Bihar implemented political reservation at the village-council (Gram

Panchayat, or GP for short) level in favour of women, SCs and OBCs. We focus on political reservation in favour of GP-heads, known colloquially as “Mukhiyas”. This paper deals with reservations in favour of SCs - a group comprising a historically marginalized set of sub-castes, many of which formed the erstwhile “untouchable” community. A little under 17 % of GPs are reserved for scheduled castes (SCs). Most of our outcomes are observed for the first term of these incumbent Mukhiyas (with some extending beyond).

Empirically ranking households within geographies on the basis of some measure of well-being is often challenging because of a lack of sufficiently representative data at every tier of the welfare distribution. Furthermore, measuring within-group favouring of households requires granular data on sub-group ethnicity. Also, observational data may not imply causality. Using a unique dataset measuring social and economic characteristics of *every*<sup>3</sup> rural household - nearly 20 million in all – in the state of Bihar, we address these concerns. We use data on ownership of assets to create wealth scores of households and use last names of members as a proxy for ethnicity (sub-caste). Some of the contributions of our paper are purely descriptive, as we believe we are among the first to bring to bear rigorous data on the sub-caste hierarchies within broad caste-groupings. Finally, we establish causality by exploiting the rule for reservation of seats for political minorities which gives rise to a regression discontinuity design.

Like [Munshi and Rosenzweig, 2016] and Pande et al (2011), we measure impact of political reservation on private *and* public goods: however, unlike the former, our public goods are somewhat locally excludable, thereby allowing for targeting of these too; furthermore, this paper measures outcomes across a wider class of public goods, a range of private assets and socioeconomic indicators at the household level.

We find some preliminary evidence of sub-caste hierarchies being replicated in candidate selection, with more ex-ante wealthier SC-jatis likely to throw up Mukhiya candidates, despite smaller own-*jati* vote-banks. We also find clientelistic politics along sub-caste lines ([Munshi and Rosenzweig, 2016]). Members of the Mukhiya’s own sub-caste seem to benefit more from reservation. There is also an apparent geographical dimension at play here: own-*jati* members who live closer to the Mukhiya are likelier to benefit more. We also find direct causal evidence of the “electoral elite” - members of the most numerous non-SC *jati* - losing out because reservation

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<sup>3</sup>While the Socio-Economic Caste Census (SECC) claims to have surveyed every household, the dataset we have received from the government of Bihar is near-complete

prevents them from contesting elections and capturing power and resources.

We find no strong evidence of reservation impacting public good provision across the GP. However, like Pande et al (2005) and [Duflo, Fischer, and Chattopadhyay, 2005], we find evidence of targeting of public goods within a GP. The average GP in Bihar comprises 5.35 villages. Within each GP, we use data on the number and proportion of SCs to identify the *SC-dominant village*. We find that the population-normalized share of public goods increases in SC-dominant villages within reserved GPs. More often than not, the SC-dominant village is *not* the Mukhiya's own village. Indeed, the two overlap in only a third of the GPs. Thus, somewhat curiously, we find no evidence to suggest that public goods are targeted towards the Mukhiya's own village. Taken together with our earlier results on private assets, we find that while private assets are targeted towards those *close* to the Mukhiya, public goods are targeted towards *all* SCs

What explains these results? We have some evidence to suggest that re-election incentives ([Ferejohn, 1986]; [Rogoff and Sibert, 1988]; Ferraz & Finan 2009) drive public good targeting towards SC-dominant villages. A full term of the incumbent Mukhiya runs from 2006 to 2011. Using annual data on night-lights, we find that the share of night-lights emanating from the SC-dominant village significantly rises in the years 2009-2011, but there is no impact otherwise. In 2009, the reservation status for all GPs was extended by another term. In other words, GPs reserved in 2006 for SCs would continue to remain reserved till 2016. 2011 was the year of the second cycle of GP elections. The fact that we see the increase in share of lights from SC-dominant villages only in these intervening years and do not see a similar pattern in the years leading up to 2016, when reservation status of GPs would change, suggests to us that re-election incentives could have played a role in explaining the patterns we observe. On the other hand, the favouring of spatially close own-sub-caste members for private asset redistribution could be a function of homophily, clientelism or the employment of brokers from close social networks.

The results suggest that mandated political reservation could help redistribute resources - both public and private - towards disadvantaged groups, without worsening mean outcomes. In the context of asset-wealth, reservation somewhat increases within group-inequality for the disadvantaged groups, but may actually reduce across-group inequality. Furthermore, re-election incentives could play a key role in redistributing public goods towards minorities.

The rest of the paper is organized as follows: we begin in section 2 by briefly outlining the

setting and context of our paper, before proceeding to delve into our data (4) and empirical strategy (3). We then outline our results (section 5) in stages: first, we look at impact of reservation on distribution of private asset gains and losses, before looking at targeting of public goods. We discuss re-election incentives as a potential mechanism. We conclude in Section 6.

## 2 Context

The setting of this study is the state of Bihar, one of India’s poorest states. The mid-2000s marked a phase of high growth and infrastructure spending and saw the state emerge from a phase of significant law and order troubles (see Witsoe 2013; Vaishnav 2017). While elections for Mukhiyas were held since 2001, the year 2006 marked the beginning of political reservations for disadvantaged groups and women. This considerably changed the composition of the new cohort of Mukhiyas. In 2001, when there was no reservation, roughly 1 % of Mukhiyas were SCs (Gupta 2001). This number went up to nearly 17 % in 2006.

The period saw a turn in the role of GPs in helping the development agenda at the local level. The financial year 2005-06 saw a three-fold increase in the devolution of State Finance Commission funds towards local councils<sup>4</sup>. Furthermore, 2005-06 was also the year the MGN-REGS - a national rural works programme that empowered workers to demand and access up to 100 days of work per household - was launched. Funds for the scheme were routed through the tiers of the bureaucracy to GPs, which then allocated it for construction of rural assets and employed local labour. The funds earmarked for this scheme, alongside a slew of other centrally sponsored schemes targeted at rural households, ensured that Mukhiyas sworn in in 2006 had seen an unprecedented increase in access to funds for development work.

SCs in Bihar - as is often the case in the rest of India too - are not a homogeneous whole. In fact, they comprise a diverse set of sub-castes, occupying different rungs in the social ladder. While there is no denying the presence of a pan-SC identity, to say that there exists no rivalries between sub-castes would be patently untrue. Indeed, in 2007 a separate group called “Mahadalit” was carved out to include those SC sub-castes that were particularly underprivileged and special benefits were extended to this group (Kumar & Somanathan 2017).

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<sup>4</sup>Panchayati Raj Institutions saw an increase in access to funds under the Twelfth Finance Commission, from 109.48 crores previously 325.92 crores. The state government of Bihar increased “establishment expenses” from 3.43 crores to 17.12 crores.

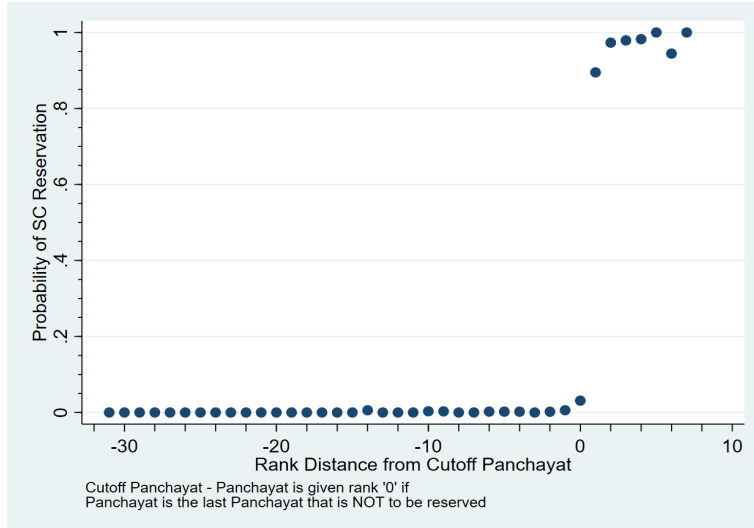


Figure 1: Graph plots the probability of reservation based on the rank of a GP within a Block. The last GP not to be reserved is given a rank 0 and the first GP to be reserved is ranked 1 and so on. Therefore, all negative ranks correspond to GPs not to be reserved and positive ones to GPs to be reserved.

### 3 Empirical Strategy

The state of Bihar is divided into 38 districts, which are further divided into 534 blocks and 8400 GPs. Within each block, the rule for reservation gives rise to an exogenous SC population cut-off below which no GP is reserved. Above the cut-off, not all GPs are reserved for SCs, as some are blocked to be reserved for OBCs. In practice, as Figure 1 shows, once we throw away GPs above the cut-off that are blocked, the first stage results in a near 85 % jump in the probability of reservation<sup>5</sup>. Thus, we have a fuzzy pooled RD with a strong first stage.

Our running variable is the difference in SC population of a GP and the mean of the SC Population of the last Panchayat to not be reserved and the first GP to be reserved. Thus, for GP  $i$  in Block  $j$ :

$$Running_{ij} = SCPop_{ij} - \left( \frac{SCPop_{1j} + SCPop_{0j}}{2} \right) \quad (1)$$

where  $SCPop$  refers to SC Population and 0 and 1 subscripts stand for the the last GP to not be reserved and the first GP to be reserved, respectively.

<sup>5</sup>We asked election officials serving at the time about the small discrepancy on the prediction in theory and the actual reservation. We were told this may have been because of the following reasons: officers calculating the cut-off wrongly; disputes regarding actual SC population figures; manipulation by local officials of the status of reservation of GPs. At least one instance of manipulation was flagged and officials punished.

## 4 Data

We have 3 main data sources. First, from the State Election Commission in Bihar, we collected data on reserved and unreserved Panchayats and characteristics of Mukhiyas elected in 2006, 2011 and 2016.

Second, we collect data on census village characteristics using Census of India's Village Amenities Surveys of 2001 and 2011. This allows us to not merely collect details on availability of various types of public goods in villages in reserved and unreserved GPs, but also contains indicators related to size, demographics and geography of these villages.

Finally, from the Bihar government's Rural Development Department, we gained access to the Socio Economic Caste Census (SECC). This survey, conducted in 2012, covered all rural households - nearly 20 million - of Bihar. At the within-household level, the survey contains basic information on members of the household including gender, broad caste category, age, type of occupation and education status.

At the household level, the dataset contains information on the following: type of dwelling including number of rooms, characteristics of wall and roof; employment and income characteristics including whether household has a member having a government job and main source of household income; asset ownership (vehicle, fridge, mechanical agricultural equipment etc); details on land-owned.

### 4.1 Identifying Sub-castes and Co-ethnics

Using data on surnames of the Mukhiya and the household head<sup>6</sup>, we attempt to test for the presence of co-ethnic targeting. One implication of this approach towards identifying coethnicity is that we are unable to perform the match for most woman Mukhiyas, since they go by the generic second-name *Devi*<sup>7</sup>.

Even in the case of men, surnames are, of course, an imprecise measure of coethnicity. Multiple sub-castes could employ the same surname. Consequently, multiple surnames could map on to the same sub-caste. For instance, the surname *Kumar* is prevalent across the caste hierarchy. Therefore, *Paswans* could go by the surname *Paswan* or *Kumar*. In this specific instance, we deal with this issue by simply dropping the surname *Kumar* from our sample - of

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<sup>6</sup>In the case of households headed by women, we use father's name of the household head

<sup>7</sup>We do not have data on the surname of the father/spouse of the woman Mukhiyas

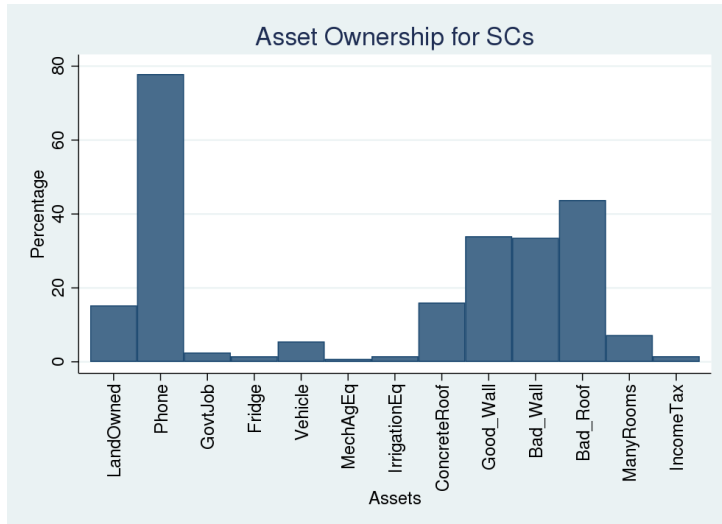


Figure 2: Graph shows Asset Ownership among SCs in the SECC data.

Mukhiyas and households - altogether.

These fears are somewhat mitigated by the fact that within a GP, it is unlikely that, in the case of a match between surnames of the Mukhiya and the household head, the two belong to different sub-castes. It is more likely that some other co-ethnic households are excluded, because they have a different surname. This implies that while we may only be capturing a sub-set of coethnic households, we almost never capture the wrong ones<sup>8</sup>.

## 5 Results

### 5.1 Descriptive Results

Using the Socio-Economic Caste Census, we create asset scores for households based on binary variables detailing assets owned (see Figure 2)<sup>9</sup>. We create 3 main types of asset scores: a raw sum of assets (RSOA) score that weighs all assets equally and adds up the binary variables; a pair of scores derived from a principal component analysis (PCA) of assets. We use two PCA scores - PCA and PCA+. The former uses exactly the same set of assets used to derive the RSOA score. The latter score is richer, adding “Bad Roof”, “Bad Wall” (Roof or Wall

<sup>8</sup>Note, also that, our search for surname matches is only within SC households - so the subset of sub-castes is small, especially within a GP.

<sup>9</sup>In creating the score, we use the following assets: concrete being the predominant material of roof of the dwelling room, burnt brick or concrete being predominant material of the wall of dwelling room, household has anyone with a government job, household pays income tax, ownership of fridge, telephone or landline, any motorized vehicle or fishing boat, land, mechanized agricultural equipment and irrigation equipment)





Figure 3: Figure shows plots of (A) PCA Scores (B) PCA+ scores (C) RSOA Scores across the 2,951,690 SC households in our data.

made of grass/thatch/bamboo/wood/mud), whether main household occupation is cultivation (as opposed to casual labour) and ownership of a farmer’s credit card<sup>10</sup> to the mix. We also construct a normalized asset score (NA) that first standardizes asset ownership and then creates an index similar to the public good index described above.

### 5.1.1 Inequality

We begin by describing the nature of inequality in our data. As Figure 3 shows, both PCA and RSOA scores show relatively flat slopes up to the 90th percentile and only then do we see a steep rise. Indeed, 90 % of our sample of 2,951,690 SC households have an RSOA score in the range 0-3. The richest household, on the other hand, has a score of 11. The top 10 % of households own 21 % of the assets. Expectedly, as Figure 4 shows, non-SCs are better than SCs at every point of the wealth distribution.

## 5.2 Candidate Selection

We first measure how reservation for SCs impacts the socio-economic background of the incoming Mukhiyas in 2006. Mukhiyas in reserved GPs report significantly lower annual incomes (0.49 sd) - see figure 5 – are younger (0.46 sd) when compared to their unreserved counterparts and are likelier to be barely literate (0.24 sd). Somewhat surprisingly, they are not significantly less

<sup>10</sup>Ownership of a Kisan Credit Card with limit beyond INR 5000

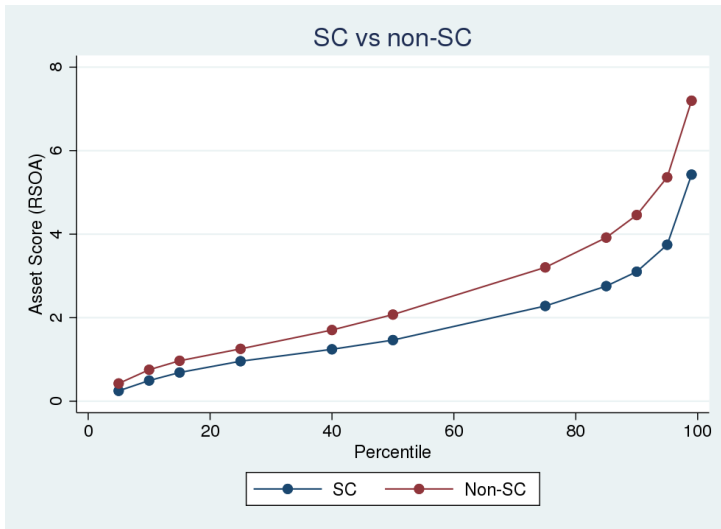


Figure 4: Graph plots the relationship between the RSOA scores for SCs (Blue) and non-SCs (Red) across percentiles.

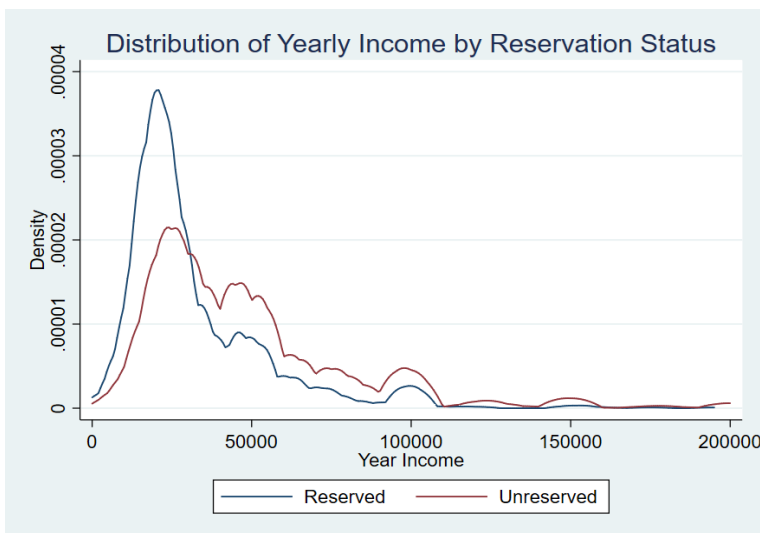


Figure 5: Figure plots kernel densities of self-reported yearly income (under 200000 of Mukhiyas in 2006 in reserved and unreserved GPs).

Table 1: Overall Impact on Mukhiya’s Characteristics

	Impact of SC reservation on incumbent Mukhiya				
	(1)	(2)	(3)	(4)	(5)
	Yearly Income(INR)	Age	Master’s	Any Degree	Barely Literate
SC Reservation	-0.49*** (0.07)	-0.47*** (0.09)	-0.07 (0.09)	-0.12 (0.10)	0.24*** (0.08)
# Observations	4467.00	4614.00	4664.00	4664.00	4664.00
District Fixed Effects	YES	YES	YES	YES	YES
Lower Bandwidth	450.713	461.95	466.549	438.58	477.032
Upper Bandwidth	450.713	461.95	466.549	438.58	477.032
Block Clusters	YES	YES	YES	YES	YES
Control Mean	.003	-.014	.007	.01	-.018

All regressions are run across all districts and all Mukhiyas for which data is available. RD is run using the optimal CCT bandwidth below and above the cut-off point. Additional covariates: Proportion of SCs in the Panchayat, Total Population of the Panchayat, Total SCs in the Panchayat, whether reserved for females, whether reserved for OBCs, Distance to nearest town, Distance to district centre, Total Area of GP. Standard errors are clustered at the block level. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

likely to hold a degree. That being said, a degree-holding Mukhiya in 2006 was not common-place: only 12 per cent of all Mukhiyas are have one. SC Mukhiyas are, as indicated previously, almost always first-timers. To summarize (see Table 1), reservation for SCs result in GP-heads who come from worse socio-economic backgrounds and are inexperienced.

The story within SCs is, however, somewhat different. We use the SECC data to create a ranking of *jatis* among SCs in unreserved GPs that fall within the RD bandwidth. Figure 6 plots this relationship for the most popular sub-castes in Bihar.<sup>11</sup> Using this hierarchy, we rank SC *jatis* in reserved GPs - those ranked 1 are the most elite sub-caste in that GP and so on.

Now, in Figure 7, we attempt to shed light the following questions: how many households, on average, does a particular ranked sub-caste have when it puts up a winning Mukhiya candidate? We do so in the following manner. First, for every GP, we calculate the asset-wealth rank of the Mukhiya’s sub-caste and also the number of households in the GP belonging to the Mukhiya’s sub-caste. Then, for every rank, we calculate the average number of households belonging to the Mukhiya’s sub-caste. The upward slope suggests that as the Mukhiya’s sub-caste falls in the caste-hierarchy, it requires more members to win the election. For instance, if the Mukhiya’s sub-caste is rank 1 in the GP, then it requires only 75 households on average to throw up a winning candidate; this number shoots up to nearly 200 households as the rank falls to 3 in the GP.

<sup>11</sup>Note, as an aside, how closely this relationship overlaps with the social status of these sub-castes: those that fall at the bottom of the distribution are also those originally classified as “Mahadalit” by the Bihar government, to signify those among SCs that occupy the lowest rungs of the caste hierarchy.

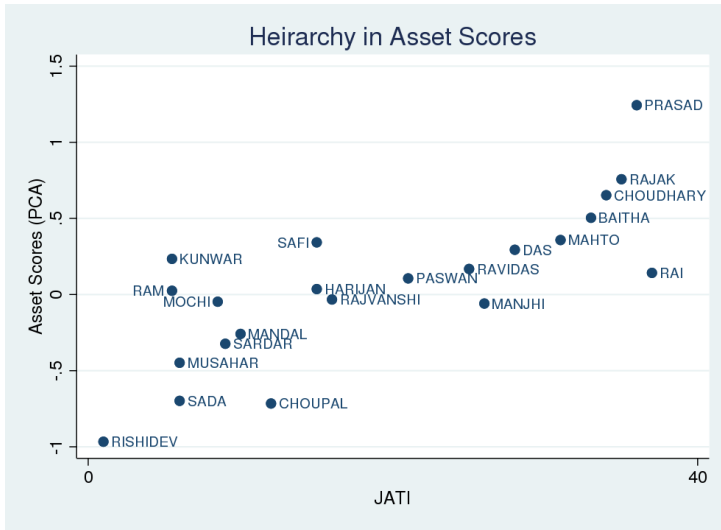


Figure 6: : Figure plots average PCA-based asset-wealth score for a cross-section of SC sub-castes (based on surnames).

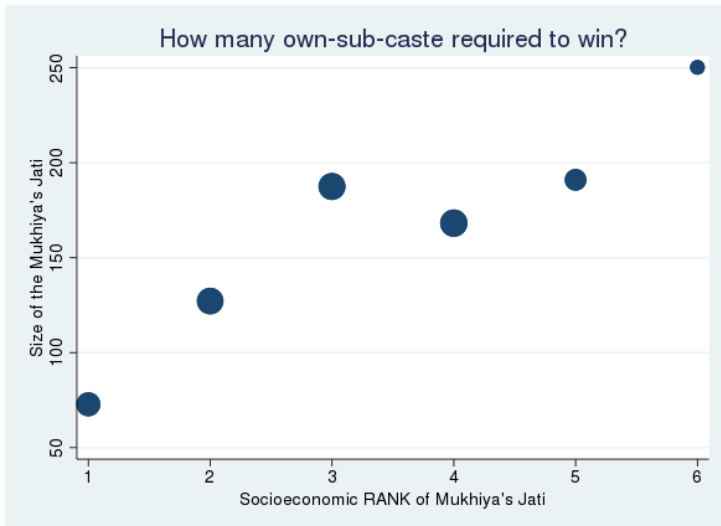


Figure 7: : Figure plots the relationship between the rank of the Mukhiya's sub-caste (x axis) and the average number of households belonging to Mukhiya's own sub-caste for that rank (y axis). The size of the marker represents the number of GPs where the Mukhiya's sub-caste is of that rank.

Despite being led by Mukhiyas who are obviously disadvantaged on these observables relative to non-SCs, reserved GPs do not see households doing worse on assets owned. Furthermore, these GPs do no worse in the provision of public goods (See Figure ?? below).<sup>12</sup>

### 5.3 Private Assets

#### 5.3.1 Losers

Reservation creates winners and losers. Turning our attention to the impact on wealth scores, we ask: who loses out? If leaders are clientelistic or display homophily, a straightforward candidate are members of the *jati* who would have won the election in the absence of reservation. As a proxy, we look at the impact of reservation on the most numerous (dominant) SC-jati in reserved and unreserved GPs. Column 4 of Table 2 shows that the mean PCA score of the most numerous non-SC-subcaste fell by 0.17 s.ds compared to those in the control GPs. This negative impact is particularly driven by a fall in asset-wealth scores of those households above the median.

Table 2: Impact on Asset Scores

	Impact of SC reservation on Mean Asset Scores			
	(1)	(2)	(3)	(4)
	ALL SCs	ALL Non-SCs	Dom SCs	Dom Non-SCs
SC Reservation	-0.00 (0.09)	-0.11 (0.09)	0.05 (0.08)	-0.17** (0.09)
Observations	7046.00	7046.00	7046.00	7043.00
Mean / BW	-.015 / 555.913	.004 / 572.159	-.006 / 571.537	.007 / 566.326
Block FE	YES	YES	YES	YES

Dependent variable: *Standardized PCA-based wealth score for groups within GP*. Column 1 refers to all SCs; Column 2 refers to all non-SCs; column 3 refers to Dominant SC sub-caste; column 4 refers to dominant non-SC subcaste. Regression is run across all districts and GPs where SECC data is available. RD is run using the optimal CCT bandwidth below and above the cut-off population of SCs within each Block. Block Fixed Effects are used. Additional covariates: Proportion of SCs in the Panchayat, Total Population of the Panchayat, Total SCs in the Panchayat, whether reserved for females, whether reserved for OBCs, Distance to nearest town, Distance to district centre, Total Area of GP. Standard errors are clustered at the block level. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

<sup>12</sup>These results may be ostensibly similar to Das, Mukhopadhyay and Saroy (2017), but the mechanisms for those findings do not apply here for the following reasons. First, the average share of SCs in our reserved GPs is around 25 % and SCs are almost never a majority by themselves in a GP. Second, re-election incentives here, therefore, are not because of the size of SCs, but driven almost entirely by the freezing of the reservation rule for another term. Thus, it is never the case that an incumbent Mukhiya - elected because of reservation - has no chance at re-election in the next term.

### 5.3.2 Winners

As the other columns of Table 2 indicate, there is no significant impact of wealth scores on any other grouping: thus, the category of winners is not immediately apparent. However, the dominant SC jati is weakly better off.

We posit that those closest to the Mukhiya will emerge winners - but what does *closeness* imply? It could refer to ethnic closeness - i.e belonging to the same *jati* of the Mukhiya; it could also refer to geographic closeness, which could mean belonging to the same village or neighbourhood. Our data allows us to measure both: we, once again, use surnames as a proxy for sub-castes. We then track the Mukhiya in our SECC data and identify village of the Mukhiya. But, we can go one further - our data also gives us census block identifiers, thus we can track members down to the Mukhiya's immediate vicinity of 50 households. However, we can go even further down, for our data numbers households in sequence - this gives us a close sense of the immediate neighbours of the Mukhiya.

Reservation doesn't occur for the Mukhiya's sub-caste, but for all SCs as a whole. Thus, the Mukhiya's sub-caste is *selected* in and direct comparisons between the Mukhiya's sub-caste in treatment and all SCs would prove naive. We attempt to get around this problem by doing the following: we compare the wealth scores of the members of the Mukhiya's sub-caste in reserved GPs and the average wealth-score of the Mukhiya's sub-caste across unreserved GPs very close to the cut-off.<sup>13</sup> Thus, while the results are still not strictly causal, we can argue with some confidence that the treatment and comparison groups are more similar and any effect can be plausibly attributed to reservation.

Figure 8 plots this relationship for the Mukhiya's sub-caste in reserved and unreserved GPs. As can be seen, the impact on asset scores increases with geographical closeness to Mukhiya's household. Indeed, members within the neighbourhood of 5 households of the Mukhiya benefit nearly 8 times more than those who belong to the same sub-caste but live anywhere in the GP.

Why does this occur? The literature - and our own experiences in the field - point to at least four explanations: *first* homophily: sub-caste networks are extremely strong (Munshi and Rosensweig 2016) and incumbent heads may simply prefer helping members of their own sub-caste group; *second*, often incumbent Mukhiyas are dependent on brokers (Witsoe 2013) to

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<sup>13</sup>We use 40 % of the RD-bandwidth as a control, but have run robustness checks for smaller and larger bandwidths.

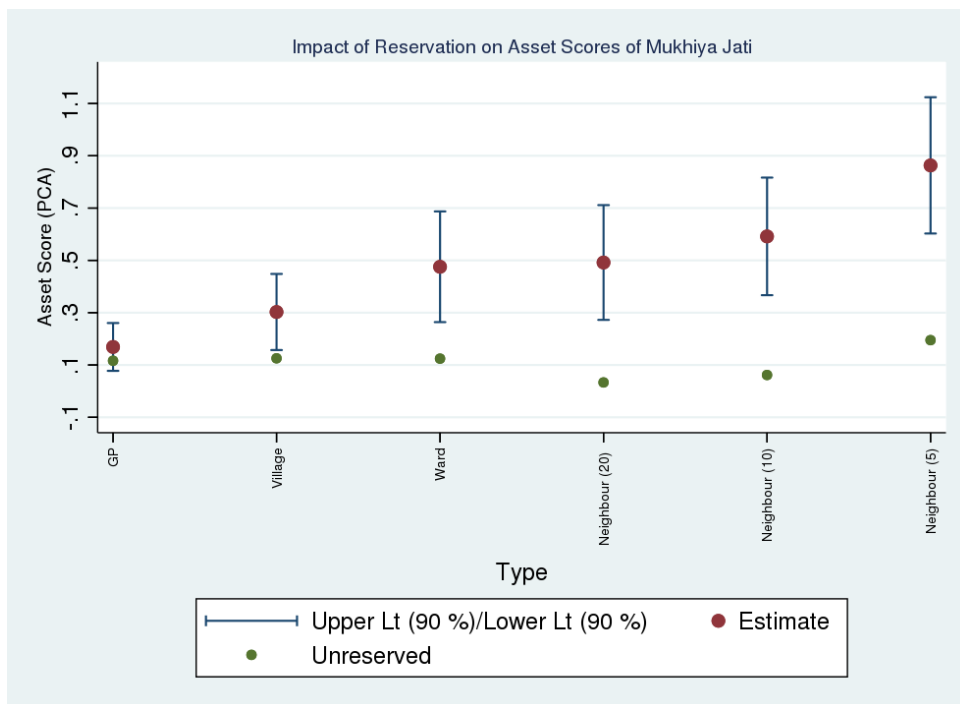


Figure 8: : Figure plots the treatment impact of reservation on Mukhiya’s jati members differentiated by “closeness” to Mukhiya. The red dot represents scores in reserved GPs and the green dot in unreserved GPs. 90 % confidence intervals are plotted. The first pair compares Mukhiya’s Jati members in reserved GPs vs average Mukhiya Jati household across control GPs close to the cut-off; the last pair makes the same comparison, except that in treated GPs, it restricts the sample to only those in a neighbourhood of 5 households to the Mukhiya. Similarly, the columns in the middle refer to the Mukhiya sub-caste members in the Mukhiya’s own village, ward, 20-household neighbourhood and 10-household neighbourhood.

carry out their tasks, many of whom are both from their own sub-caste and live close to them; *third* and related, clientelism: Mukhiyas may prefer private hand-outs to those who they know form their core vote-bank. Handouts to sub-caste members may get around the double-incentive problems associated with vote-buying, since sub-caste members are better able to enforce control on Mukhiyas and Mukhiyas find it easier to enforce voting commitments (including, but not only restricted to turnout).

## 5.4 Public Goods

### 5.4.1 Targeting Towards Dominant SC Village

We now turn to targeting of public goods. Our public goods are measured at the village level. Thus, natural candidates for targeting include targeting of goods to the dominant SC village or the Mukhiya's own village. These, two, surprisingly do not overlap to a large extent (only 37 % cases where the Mukhiya comes from the Dominant SC Village).

The Census of India collects a range of public goods - we focus on four main types of public goods: education, roads, welfare and electricity. For education, we focus on primary schools, which are common, but not ubiquitous; for roads, we focus on all non-kuccha (mud) roads; for welfare, we turn to the public distribution system and for electricity, we use power for domestic use. This list was drawn up after focus-group discussions with Mukhiyas in two districts of Bihar. An additional public good that came up was the Anganwadi (Child Welfare Centre), but the census records 96 % of villages in 2011 to have an Anganwadi, so we drop it since it provides almost no variation.

We find evidence of public good targeting towards the SC-dominant village<sup>14</sup>. Following Duflo et al (2005), for each public good, we calculate the population normalized share of the public good<sup>15</sup> accruing to the dominant SC-village within a GP. Therefore, for public good  $i$  in GP  $G$  with dominant village  $v$ :

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<sup>14</sup>We define the SC dominant village in the GP is the GP that has the highest concentration and number of SCs within a GP, as per Census 2001 data. For each village within a GP, we calculate an *SC Index*: it is the product of the share of SCs in the village and the number of SCs in the village - the village with the highest value of this index is deemed as the SC dominant. We use this index as opposed to its individual components since both number and share of SCs are important in determining dominance.

<sup>15</sup>A simple example will clarify what the share of the public good in this context is: suppose there are 5 villages in a GP. Suppose 4 of these have a primary school and one of these is the dominant SC village. Then, the share of primary schools to the SC dominant village is 1/4 or 0.25.



$$PopulationNormalizedShare_{iG} = \left( \frac{ShareofPublicGood_{iv}}{ShareofPopulation_{iv}} \right) \quad (2)$$

We standardize the population normalized shares of these individual public goods and create a public good index. Table 3 provides the impact of reservation in s.d units: a normalized index of these public goods increases between 0.16 and 0.2 standard deviations. The impact is positive and large across most of these public goods, but is particularly strong for roads (0.13 - 0.4 s.d improvement), primary schools (0.14 s.d) and the public distribution system (0.17 s.d).

Table 3: Impact on Public Good Targeting

	Impact of SC reservation on Public Goods in Dominant SC Village								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Normalized Public Index 1	Normalized Public Index 2	Primary Schools	Major District Road	Other District Road	Village Approach Road	Pucca Road	PDS	Domestic
SC Reservation	0.20*** (0.06)	0.16*** (0.06)	0.14** (0.07)	0.19 (0.17)	0.40** (0.16)	0.20** (0.09)	0.13 (0.11)	0.17* (0.10)	0.09 (0.08)
Observations	7046.00	7044.00	7035.00	4918.00	5723.00	6547.00	6444.00	6028.00	5866.00
Mean / BW	-.012 / 606.756	-.001 / 591.3630000000001	1.078 / 605.263	.968 / 509.209	1.069 / 695.8820000000001	1.085 / 750.826	1.055 / 501.843	1.037 / 664.376	1.032 / 555.555
Block FE	YES	YES	YES	YES	YES	YES	YES	YES	YES

Dependent variable: Average population normalized share of public good in the SC dominant village within a GP (s.d units). Regression is run across all districts and GPs where lights data is available. RD is run using the optimal CCT bandwidth below and above the cut-off population. SCs within each Block. Block FE are added. Additional covariates: Proportion of SCs in the Panchayat, Total Population of the Panchayat, Total SCs in the Panchayat, whether reserved for females, whether reserved for OBCs, Distance to nearest town, Distance to district center, Area of GP. Standard errors are clustered at the block level. \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01

A similar result is obtained when we consider night-lights emanating from the SC-dominant village within a GP. Using yearly data on night-lights, we consider a similar indicator to the one constructed for public goods, except, in this case, we create, for each GP, the population normalized share of night-lights emanating from the SC dominant village. Controlling for shares in 2005, we calculate the mean change in the share of night-lights for the period 2007-2011. Table 4 displays the results - the share of night-lights from the SC dominant village increases by 30%. Insofar as night-lights are a proxy for economic activity, these results seem to indicate that reservation affects the spread of economic activity within a GP and biases it in the favour of the SC-dominant village.

#### 5.4.2 Targeting towards Mukhiya Village

We find no evidence of targeting of public goods towards the Mukhiya's own village. Table 5 shows this clearly - the entire public good targeting effect seems to be driven by those GPs where the Mukhiya's Village and the Dominant SC Village do not overlap. Indeed, when they do overlap, the targeting effect seems to be negative.

Table 4: Impact on Lights Share from SC-Dominant Villages

	Share of night-lights from SC-dominant Village
	(1) Lights 2007-11
SC Reservation	0.30** (0.15)
Observations	4033.00
District Fixed Effects	YES
Lower Bandwidth	
Upper Bandwidth	
Block Clusters	
Control Mean	

Dependent variable: *Average population normalized share of night-lights emanating from the SC dominant village within a GP for the period 2007-11.* Regression is run across all districts and GPs where lights data is available. RD is run using the optimal CCT bandwidth below and above the cut-off population of SCs within each Block. Regression controls for population normalized share of night-lights for the year 2005 for SC dominant village within a GP. Additional covariates: Proportion of SCs in the Panchayat, Total Population of the Panchayat, Total SCs in the Panchayat, whether reserved for females, whether reserved for OBCs, Distance to nearest town, Distance to district centre, Total Area of GP. Standard errors are clustered at the block level. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

## 5.5 Mechanisms: Re-election Incentives

A natural question to ask is the following: if sub-castes are heterogeneous, spill-overs non-trivial and private goods allow for fine targeting, then what other factors could incentivize targeting of public goods towards *all* SCs? An explanation often cited in the literature pertains to re-election incentives. We exploit the yearly availability of village-level night-lights data to provide some evidence that suggests this.

As mentioned previously, in our data, Mukhiyas come to power in 2006 for a five-year-term with, for reasons mentioned previously, negligible re-election incentives. In 2009, however, the law was amended to freeze the reservation status of GPs for another term. This meant that for SC-reserved GPs, while fresh elections would be held in 2011, only SCs would contest.

The implications of this change in the law were three-fold: *first*, incumbent SC Mukhiyas had, all of a sudden, strong re-election incentives<sup>16</sup>. Standard re-election models would predict

<sup>16</sup>One could argue that the freezing of reservation status of GPs would increase re-election incentives in unreserved GPs too. However, we have reasons to believe this effect wouldn't be as strong as in SC-reserved GPs. Among the non-SC reserved GPs, GPs could either be unreserved or reserved for OBCs. All these castes rank higher than SCs in the caste hierarchy and are likelier to be wealthier too. Furthermore, they are likely to be more numerous. Thus, unless blocked because of a reservation status change in favour of SCs, the incumbent Mukhiyas are likelier to be elected *ex ante* - i.e in the absence of a freezing of reservation status - than their SC counterparts.

Table 5: Dominant SC Village vs Mukhiya Village

Impact of SC reservation on SCs across the distribution			
	(1)	(2)	(3)
	Public Good Index	Public Good Index	Public Good Index (Mu)
SC Reservation	0.68** (0.28)	0.69** (0.30)	-0.11 (0.52)
Observations	7540.00	7270.00	6543.00
Mean / BW	.035 / 572.027	.068 / 695.946	.142 / 804.495
Notes	Control for Mukhiya's Village	Dropping where Main = Mukhiya	Keeping only Main = Mukhiya

Dependent variable: *Average population normalized share of Public Good Index*. In column 1, we focus on share impact overall (*not* in s.d units); In column 2, we keep only those reserved GPs where Mukhiya Village and Dominant SC Village are the same. In column 3, we keep only GPs where the two don't are not the same. Regression is run across all districts and GPs where census data is available. RD is run using the optimal CCT bandwidth below and above the cut-off population of SCs within each Block. Block FE are added. Regression controls for population normalized share of night-lights for the year 2005 for SC dominant village within a GP. Additional covariates: Proportion of SCs in the Panchayat, Total Population of the Panchayat, Total SCs in the Panchayat, whether reserved for females, whether reserved for OBCs, Distance to nearest town, Distance to district centre, Total Area of GP. Standard errors are clustered at the block level. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$

that this implied the incumbent SC Mukhiya would exert greater effort. *Second*, given that only SCs can compete in the subsequent election, a standard Downsian framework would predict targeting of resources towards SCs. *Third*, the timing of the law-change implies we should see this effect post-2009.

In Figure 9, we plot the share of night-lights emanating from the SC-dominant village by year. As can be seen, the share hovers around 1 in the unreserved GPs: in other words, insofar as night-lights are a proxy for economic activity, this suggests to us that there is no bias against or towards SCs in unreserved GPs. However, in reserved GPs, we see that the share of night-lights rises to be significantly above that in unreserved GPs only for the years 2009-2011. The fact that we do not see an increase in share of night-lights for the period 2014-16 i.e the years leading up to the subsequent election, where reservation status would change, is exactly in line with what the theory would predict. A caveat is in order here: the lights-data has been put together using two separate datasets. Hence, the years 2014 onwards may not necessarily be comparable to those before.

## 6 Conclusion

This paper begins with the understanding that when it comes to political reservation for SCs in India, the benefits are extended to a minority group that is both heterogeneous and hierarchical. We document the nature of this inequality in this paper, using our 20 million household data to create asset-wealth curves and chronicle wealth hierarchies among sub-castes (using surnames as proxies). This inequality creates tensions, because the benefits of reservation cannot accrue

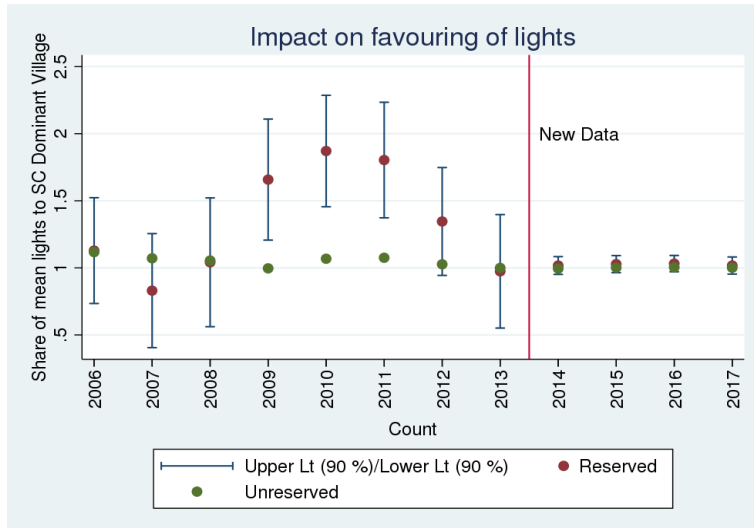


Figure 9: Figure plots the population normalized share of night-lights emanating from the SC dominant village within a GP by year. We drop extreme observations that may bias results. We control lights share for 2005. From 2013 onwards, we use new, more granular night-lights data released by NASA. Hence results may not be comparable.

to all equally. Thus, we argue that it is important to look beyond mean outcomes and focus on distributional consequences, both in access to public goods and private assets.

Our paper brings to bear rich data on village-level public goods and night-lights, household-level socioeconomic variables (including sub-caste) and individual-level data on GP-heads to argue that reservation creates a complex web of winners and losers. With respect to private wealth, those closest to the Mukhiya, both ethnically (same sub-caste) and spatially (same neighbourhood) benefit the most. This sub-caste favouring can also be seen in who loses out: members of the numerically dominant non-SC sub-caste, who are potential front-runners to win the election in the absence of reservation. These results could be driven by homophily, clientelism or the usage of brokers from close social networks. For public goods, we find reservation resulting in greater targeting towards all SCs, as opposed to those close to the Mukhiya. This, we argue, is because Bihar's unique experiment with reservation created incentives unlike any other place in India - by freezing reservation status of GPs for two terms, re-election incentives strongly ensured greater targeting of public goods towards SCs.

The consequences of reservation are contingent on factors beyond merely the proportion of SCs in the GP and, in fact, rely greatly on the underlying sub-caste structures and the strength of re-election incentives.

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