

# The political economy of public goods: Some evidence from India.\*

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## Abstract

We're interested in how public goods get allocated by a centralized state. We use data public goods and social structure from parliamentary constituencies in rural India to understand the allocation of these goods over the seventies and eighties. National policies and political agendas during this period emphasized universal access to basic amenities and financed a rapid expansion in rural infrastructure. We find evidence of considerable equalization in many of these facilities, reflecting perhaps the importance of these commitments. Among the historically disadvantaged social groups, those that mobilized themselves politically gained relative to the others. Measures of social heterogeneity that have been emphasized in the recent empirical literature on public goods are relevant but not overwhelming in their importance.

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# 1 Introduction

It is well recognized that the nature of political power within societies influences the allocation of public resources. Robert Bates in his well-known studies of the evolution of political power in post-independent Africa showed how the growing power of specific ethnic groups was reflected in the way public resources were used (1973, 1976, 1981). In the case of India as well, there is a large literature showing how specific groups (ethnic or otherwise) have increased their political salience and laid claims on the munificence of the state (Rudolph and Rudolph (1987), Varshney (1995), Jaffrelot (2003) and Chandra (2004)).<sup>1</sup>

A related but distinct literature has examined the role of social heterogeneity on the availability of public goods. Most prominently associated with with the work of Alesina, Baqir and Easterly (1999), this work focuses not on the fortunes on specific groups but rather on the problems associated with multiple groups and divergent interests. A standard conclusion in this literature is that increased ethno-linguistic fragmentation is associated with reduced access to local public goods, often because it inhibits communities from working collectively to extract public goods from a recalcitrant state.<sup>2</sup>

An alternative approach emphasizes the autonomy of implementing authorities in the use public resources and underscores the discretion that politicians and bureaucrats retain despite the constraints imposed by social structures. The exercise of such discretion is the subject of theories of governance: incumbent bureaucrats may be driven by a shared agenda or ideology (Weber (1947)), the need to appear even-handed (Wilson (1989)), a desire to please everyone (Dixit (1996)), or plain cupidity. Tendler's (1997) book on *Good Governance in the Tropics* discusses the role of suitable organizational design in creating an autonomous and effective bureaucracy in an otherwise difficult environment in the Brazil-

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<sup>1</sup>According to Jaffrelot (2003), the political importance of social groups in India is a natural result of imposing political democracy "on a social system dominated by the hierarchical logic of castes" (p. 3). Rudolph and Rudolph (1987) attribute the absence of class politics (and the importance of social groups in politics) to the small share of the organized labor force and the importance of public relative to private capital in the post-Independence period. Varshney (1995) shows how agricultural policies in India represented the growing political power of rural landlords and Chandra (2004) examines the conditions under which caste based parties have been successful in the Indian political context.

<sup>2</sup>Among the many studies of social heterogeneity on public goods are Alesina and La Ferrara (2000), Baland and Platteau (1998), Bardhan and Dayton-Johnson (2001), Dayton-Johnson (2000), Khwaja (2002) and Miguel (2000).

ian state of Caera. Montero(2001) explains why the bureaucracy in another Brazilian state (Minas Gerais) could function with a great deal of independence. Hargrove (1994) describes how the leadership of the Tennessee Valley Authority (TVA) in the United States became trapped by the myth of the TVA as a heroic organization and took the organization in directions that ultimately lead to a crisis. Wade (1982) provides an interesting account of how the entire system of delivering irrigation water to farmers in Southern India was structured to facilitate bribe collection by bureaucrats in the public works department.

The influence of local structures may also be neutralized by outside forces: A local bureaucracy might be vulnerable to pressures from a federal judiciary or international public opinion. The desegregation of the U.S. South, for instance, was at least as much a result of such external pressures as it was a consequence of unrest among the Blacks.

We examine the location of public goods between 1971 and 1991 in about 500 parliamentary constituencies in rural India to assess the relative importance of these influences on the allocation of public resources over this period. India is in many ways an ideal place to study the importance of social structure on the provision of public goods. Its traditional social hierarchy, with its caste and religious divides, has been well documented in historical sources. In addition, starting in the early seventies, the state adopted the rhetoric of removing poverty and providing universal access to public goods. Over the two decades covered by our study, there was a rapid expansion of rural infrastructure and federal budgets introduced specific schemes to favor two historically disadvantaged groups, the Scheduled Castes and the Scheduled Tribes. We ask whether the data provide evidence of convergence in the availability of public goods across the country reflecting the fulfillment of stated agendas or whether these attempts were frustrated by powerful communities appropriating the additional facilities.

For each public good, we use data on the number of villages in a constituency with access to the facility. We restrict ourselves to the set of facilities that are defined by the Indian Census in a roughly consistent manner over this period. There are a total of fifteen of these, spanning a range of categories: education, health, water, power and communication facilities. We first use a data cross-section from 1971 to examine the correlates of public good availability at the start of our study period. For each public good, we estimate the probability that a community receives the good as a function of the shares of particular social groups in the population, diversity measures such as the ethno-linguistic fractionalization index that is standard in the literature, asset inequality in terms of the Gini coefficient of land holdings,

a measure of political fragmentation and a range of geographical controls.

Our analysis of the 1971 data suggest that group identities are strongly correlated with access to public goods: Areas with a concentration of Brahmans, the elite caste that is traditionally associated with reading, writing and religious activities, have higher levels of schools, post offices and piped water in 1971, but do not do especially well in other categories. Muslims, the largest religious minority, do worse for most categories of public goods while Christians, associated with the erstwhile colonial power, tend to do better than average. Areas with a presence of the two groups at the bottom of the social hierarchy, the Scheduled Castes and Scheduled Tribes, have lower access to almost all goods.

Turning to measures of heterogeneity, we find that the standard measure of ethno-linguistic fragmentation applied to caste and religious divisions negatively affects access to public goods. On the other hand, concentrated land ownership is associated with higher levels of provision, perhaps reflecting the disproportionate political weight of large landowners in pre-independence India, which continued, though increasingly challenged, into this period. In 1971 many of the most important changes that would transform rural India were only beginning. Finally, we see that constituencies with larger villages are served better, consistent with the common view that it is easier to deliver public goods if the population is geographically concentrated.

These results should of course be interpreted with caution, based as they are on a single cross-section: Part of the positive association between Christian populations and the existence of schools and hospitals, for example, might be attributed to the long-standing presence of missionaries in these areas who facilitated religious conversions and established facilities that were later taken over by the state. It is also possible that social structure was influenced by the location of public goods—the presence of a high school may have attracted Brahmans to an area rather than the other way around. Nevertheless, we believe these results are useful in that they parallel what other studies using cross-sectional data have typically found: Influential groups have better access and ethno-linguistic fragmentation appears to have a negative effect.

In the two decades after 1971 there was a dramatic expansion in rural infrastructure. By 1991 primary schools were available in nearly three-quarters of all villages. Over the two decades, villages with electricity connections went from 18 to 70 per cent and there was a

nine-fold increase in access to piped water. To understand who benefitted from this dramatic expansion, we use a two year panel constructed using data from the census years, 1971 and 1991. Our specification controls for unobserved constituency level effects but differs from the standard fixed-effects model in that we do not constrain the coefficients on our observed explanatory variables to be the same in both years. It is the changes in these coefficients that are of primary interest to us. We also include as a regressor the initial level of each public good in 1971 to estimate the extent of convergence in public good access over this period.

The conclusions from the panel data analysis provide an interesting counter-point to the cross-section results. The strongest results relate to convergence: For 12 out of the 15 public goods for which we have data in both years, higher access in 1971 is associated with significantly slower growth in the subsequent period, controlling for other constituency characteristics. This would not be surprising if access to these goods was close to complete at the start of the period—in fact, it would be mechanical. This was, however, very far from true. The expansion in public goods during this period, though dramatic relative to the past, resulted in high rates of coverage only for a small set of goods in a few states. Half of the goods we consider were available in less than 5 per cent of Indian villages in 1971 and in less than 10 per cent of villages in 1991.

We argue that this strong tendency towards convergence in the 1970s and 1980s is best understood in the context of political agendas of that period. Under Indira Gandhi's Garibi Hatao<sup>3</sup> program, first put forward during her election campaign in 1971, the Indian state, for the first time, made an explicit pledge to provide public goods to everyone; other, even broader commitments were made by subsequent governments. Our results suggest that these commitments, once made, were relatively binding.

Our results also suggest important realignments in the influence of minority groups. Areas with Scheduled Caste concentrations gain in access to several facilities (high schools, health centres, piped water), while those with Scheduled Tribes and Muslims remain disadvantaged. This contrast between Scheduled Castes and Scheduled Tribes should not surprise those who are familiar with the Indian political landscape. The increased assertiveness and political representation of the Scheduled Castes have been a recurring theme in recent writings on Indian politics. In contrast, the Scheduled Tribes remained, until the mid nineties,

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<sup>3</sup>Translated as "remove poverty".

largely invisible on the political stage.

We perform one simple exercise to substantiate our speculation on the reasons for the relative neglect of the Scheduled Tribes. After political independence seats in the Indian parliament were reserved for candidates from both the Scheduled Castes and Scheduled Tribes, roughly in proportion with their population share. In the 1971 parliamentary election, the Congress Party, which dominated Indian politics at the time, won 68 per cent of seats reserved for Scheduled Caste candidates and 77 per cent of those reserved for the Scheduled Tribes. In the years that followed a number of regional and caste-based parties emerged. By 1991, the Congress won only 41 per cent of the seats reserved for Scheduled Castes, but two-thirds of those reserved for the Scheduled Tribes. Using a logit model to estimate the effect of the social structure of a constituency on the probability of a Congress win in each of these years, we find no significant compositional effects in 1971. Areas with concentrations of Muslims, Christians, Scheduled Castes or Tribes appear to behave much like other areas once we control for state-level fixed effects. In contrast, in 1991, a higher share of Scheduled Tribes in the population is highly correlated with the success of the Congress party. These results suggest that, at the end of our period, independent political leadership among the Scheduled Tribes had yet to emerge. The relatively elite Congress leadership was still being relied on to represent tribal interests, and it appears to have served them rather badly, at least in terms of access to public goods.

These results, with all their limitations, suggest that while the durable structures of society, shaped in India by caste and religious divides, are clearly important, there is considerable fluidity in the system. The influence of different groups and their political coalitions shifted considerably over time and these changes influenced the allocation of public resources. In addition, our results on convergence suggest that federal mandates can improve access to public goods even without a corresponding realignment of social structures.

The next section provides some historical background on policies of the Indian government relating to the provision of public goods. Sections 3 and 4 discuss data sources and our empirical approach. Section 5 presents results, first for the 1971 cross-section and then for the 1971-1991 changes. Section 6 concludes with a discussion of the implications of our findings.

## 2 Historical Background

The Indian constitution divides government functions and financial authority between the central and state governments. As in most federal systems, the states are primarily responsible for health, education and community development programs. States spend about 80 per cent of total government expenditures on these categories and large financial transfers from the center allow them to implement development programs outlined in the national five-year plans. Until the nineties, active local governments below the state level existed only in a few states and had very limited resources.<sup>4</sup>

Access to state-provided basic public goods was severely limited in the pre-independence period, reflecting the articulated policy of the colonial state that public investments need to be justified by their contribution to the interests of the colonial power. The early post-independence years emphasized state investments in heavy industry and the general neglect of basic public goods continued. As a result, in 1971, while 53 per cent of all Indian villages had primary schools, only 4 per cent had high schools, one-quarter had paved roads, less than one-fifth had electricity connections and all but 6 per cent had no medical facilities.

Starting in the late 1960s we observe a proliferation of official statements reiterating the government's commitment to providing *universal* access to public goods. The first explicit statement on universal primary education was the National Policy on Education in 1968, 21 years after independence. The Minimum Needs Program, launched during the fifth five-year plan in the mid-seventies, set down explicit norms about access to public goods in rural areas. The sixth five-year plan clarifies the motivation for these norms:

*In the absence of such a programme, the pressure for investments in the development of infrastructure and production sectors left relatively small allocations for social services.... The Minimum Needs programme lays down the urgency for providing social services according to nationally accepted norms, within a time bound programme.... Its components are: (1) Elementary Education (2) Rural Health (3) Rural Water Supply (4) Rural Roads (5) Rural Electrification (6) Housing assistance to rural landless laborers....*<sup>5</sup>

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<sup>4</sup>A constitutional amendment in 1993 required all states to form village level governments which would be elected every five years. Since then their share of government spending has increased to about 6%.

<sup>5</sup>Planning Commission, Sixth Five Year Plan, Chapter 14.

The Plans envisioned a primary school and a safe water source within a mile of every village, paved roads to villages with populations over 1,000 and electricity to at least 40 per cent of villages in every state. A multi-tiered health system was introduced with Health Centers for large settlements, a Primary Health Centre for every 30,000 people and Primary Health Sub-Centers for every 5,000 people. Some of these norms were subsequently relaxed while others became more stringent, depending on what was considered feasible; but there was, by and large, continuity in these policies. In addition to the above programs, special initiatives were introduced to ensure that these facilities reached marginalized communities. Most plans reiterate the constitutional directive to state policy to *promote with special care the educational and economic interests of weaker sections of the people and in particular of the Scheduled Castes and Scheduled Tribes*.<sup>6</sup>

The early 1970s thus saw a number of key adjustments in the attitude of the Indian state towards the delivery of public goods: It became much more explicit about its responsibilities. Not accidentally, this was accompanied by a readjustment of the political rhetoric: Indira Gandhi made the removal of poverty (*Garibi Hatao*) the cornerstone of her successful election campaign in 1971 and it became increasingly common for election campaigns to be fought on the basis of who would deliver the (public) goods.<sup>7</sup>

Consistent with political and policy statements, the two decades after 1971 saw a very substantial expansion in rural infrastructure. Changes in the fraction of villages with each of fifteen amenities can be seen in Table 1a: Villages with primary schools went up by about 50 per cent, secondary school access doubled, electricity connections almost quadrupled, phone connections went up by a factor of six and the fraction of villages with piped water increased nine-fold.<sup>8</sup>

It certainly appears that the state felt a compulsion to deliver on its new commitments.

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<sup>6</sup>Sixth Five Year Plan, Chapter 26.

<sup>7</sup>Today this is entirely the norm: The 1998 elections to the Madhya Pradesh state government were won by the incumbent party based partly on the new Education Guarantee Scheme, but they lost the 2003 elections, when the opposition successfully made the case that they failed to deliver water, roads and electricity. The National Elections of 2004 saw a marked anti-incumbency wave and the post-election survey by Center for the Study of Developing Societies found widespread dissatisfaction of the electorate with basic infrastructural facilities.

<sup>8</sup>Not all listed facilities expanded. The fraction of villages with functioning wells declined and health centres and dispensaries stayed roughly constant. This may reflect, at least in part, a relabeling of health facilities with the introduction of the new three-tiered classification outlined in the Five-Year Plans.



One might speculate that local politicians and bureaucrats welcomed these large-scale construction programs. For some, these programs offered, for the first time, the means for significant rural development; for others, extensive patronage possibilities. What is unclear, and this motivates a more careful examination of the data, is the extent to which these actors responded to their own objectives rather than the collective demands of the various communities competing for these goods. Such collective articulation could take several forms: Informing politicians that the provision of these goods is important for their reelection, visits to district administrators who implement development plans, or local contributions of land or labor which lower state costs of building schools and health facilities.<sup>9</sup> All of this is presumably easier for groups that work well together; social fragmentation is therefore likely to matter. On the other hand, the presence of an articulate and politically connected elite ought to help; areas with a high density of Brahmans or other influential groups may do better than Scheduled Tribe dominated areas. The presence a landed elite might also help for this reason, though it might also hurt if economic inequality undermines collective action.

Our goal is a quantitative assessment of the relative importance of these factors.

### 3 Data

We have pooled secondary data from a variety of official sources. Most of these were available for administrative units. In this section we discuss the original data sources, describe and justify the choice of variables that we use in our empirical analysis and outline the procedure used to map administrative data to political boundaries. We use parliamentary constituencies as our unit of analysis because members of parliament are influential relative to the bureaucrats that head districts (administrative units of comparable size), and also because these boundaries have experienced only a few changes since the seventies where as the number of districts has increased substantially.

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<sup>9</sup>These myriad forms of collective action are well illustrated in the south Indian village studied by Epstein et al. (1998). The village had many facilities that were unusual for a village of its size— piped water resulted from meetings between the village council and the district administration, a high school was sanctioned after one of the village families provided a building, and a health center was constructed after the villagers donated land for it.

### 3.1 Public Goods

Data on the location of public goods are from administrative records compiled by the Census of India. These are referred to as *village directory* data and are available for each census year since 1961. The public good categories were standardized in 1971 and for 1971 and 1991, the census published district-wise data on the fraction of villages with each public good. Data for the other years (1961 and 1981) are incomplete and not strictly comparable.<sup>10</sup> We make some use of the 1961 data but are severely limited in the extent to which we can do so because at that time only a few public goods were reported in a consistent manner by the different states.

We use the entire set of infrastructure goods for which data is available in both census years.<sup>11</sup> We are mostly confident that these can be identified as public goods in the sense that they are collectively consumed by multiple families. There is more ambiguity about whether these are publicly provided: The village directory data refer to the total number of facilities available in a district, irrespective of ownership and management and we do not have separate numbers for state-operated facilities. In some cases, this is not a problem since the categories were either created by the state or provision was exclusively by the state. During our period, this is largely true for the different types of health centers, piped water, electricity, post offices, phone connections and paved roads. Until the 1990s, private schools were concentrated in urban India, so rural figures reflect mainly state provision. In the case of dispensaries and hospitals, and especially in the case of wells and tanks, we are less sure. Wells and tanks are often the private domain of a single family or a group of related families. Some hospitals and dispensaries were privately owned while others were either state-owned or community-owned. We present results for all listed categories, leaving it to the reader to interpret them with these caveats in mind.

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<sup>10</sup>For 1971, they were compiled in an occasional paper (Office of the Registrar General, India (1987)). For 1991, we obtained the Data directly from Office of the Registrar General, India. These were subsequently published by them (Office of the Registrar General, India (1997)).

<sup>11</sup>There are a total of 18 public good categories listed in the 1971 census. We exclude three of these: colleges, post and telegraph offices and the combined category of tubewells and handpumps. The first of these is essentially an urban facility. Even in 1991, less than 1 per cent of Indian villages had a college. The combined category of post and telegraph offices is ignored because it is not used in 1991. Post offices are listed in both years and we do use this as one of our goods. In 1991 tubewells and handpumps are listed separately and there is no combined category. Since we use data aggregated at the district level, we could not generate the combined figure.

Table 1a lists summary statistics on the availability of different types of public goods in 1971 and 1991 and Table 1b contains state-wise figures for selected categories in 1971. The data provide abundant evidence that access to public investments was not uniform. In 1971 only 20 per cent of the villages in the state of Himachal Pradesh had primary schools while 81 per cent of villages in Maharashtra and 95 per cent of those in Kerala did.

The variation within states in 1971 was almost as stark. In Andhra Pradesh, a state with relatively high levels of provision in 1971, constituencies in the north-eastern tip had about one-third the coverage of those further down the same coastline. We also find that some states were much more active than others in increasing coverage. The eastern state of Bihar and the western state of Gujarat both had less than one in six villages with electricity in 1971, with Gujarat slightly behind Bihar. By 1991, almost every village in Gujarat had electricity, while coverage in Bihar was about 40 per cent. Some state-level differences in performance reflect differences in priorities. In both Punjab and Madhya Pradesh there was negligible access to piped water in 1971; this facility spread to over a quarter of all Punjabi villages by 1991 but to less than 3 per cent of villages in Madhya Pradesh. In contrast, the availability of post offices in Punjab stayed almost unchanged, whereas the number in Madhya Pradesh almost doubled. These variations underscore the need to control for state-effects in our estimation strategy. We come back to this issue in Section 4.

### 3.2 Caste and Religion

The social structure of Indian villages and its effects on village life have been much studied by anthropologists, and the Indian caste system continues to be a primary lens through which village life is observed. Hindus (the major religious group) are divided into a number of castes, with strict and long-standing rules that govern their interaction. Marriages rarely take place across caste boundaries and the sharing of food and other social interactions are dictated by the caste system. While there is some slow mobility of caste groups in the hierarchy over long periods of time, there is almost no mobility of individuals across these groups.<sup>12</sup> Within villages, castes often inhabit different hamlets and the distinction between

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<sup>12</sup>“Classes are—in principle and, to some extent, in practice—open; castes are not. One may change one’s position from tenant to landowner, or from agricultural laborer to owner-cultivator. One cannot, however, change from a Vellala into a Brahmin or from a Palla into a Vellala...Movement upwards or downwards within the caste system is, in theory, inadmissible, although there is some movement in practice. Yet there

the *upper* and *lower* castes is particularly sharp. Brahmans are traditionally placed at the top of the caste hierarchy while those castes that are now listed in the Indian Constitution as the Scheduled Castes have formed the bottom. There are also other socially disadvantaged groups that have been largely outside the Hindu caste system; these are listed as Scheduled Tribes in the Indian Constitution.

Society is also divided by religion, and Muslims, Christians and Sikhs are the principal religious minorities. Buddhists and Jains are also tabulated by the Census, but form less than 1 per cent of the Indian population. The populations of Scheduled Castes, Scheduled Tribes and major religions are available for all census years post-independence. Scheduled Tribes are more localized than the Scheduled Castes and villages are often inhabited by a single tribe. There are no Scheduled Tribes in 2 of the 16 major states in our data set and about half of all the parliamentary constituencies in our data have less than 1 per cent of their population in this category.<sup>13</sup> Scheduled Castes form about 15 per cent of the Indian population and usually live in villages inhabited by other castes.

The last detailed enumeration of caste was done by the colonial administration during the census of 1931.<sup>14</sup> These data are available by district, separately for each province under British rule and the semi-autonomous princely states. State boundaries were redrawn after independence but district boundaries remained relatively undisturbed, except for areas that were formerly in the independently governed princely states and were brought under Indian government after political independence. For all new districts created after 1931, we weight caste figures from the original district according to the area of the new district which was taken from them. We do the same for districts that were newly created in the post-independence period.

The number of castes listed in the 1931 census is very large and we restrict ourselves to Hindu castes that form more than 1% of the population of each state or province in 1931. This gives us a total of 185 caste groups.<sup>15</sup> We make one major adjustment to this data to account

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are significant differences between social mobility in the caste system and social mobility in the class system. In the latter it is the individual who moves up or down, whereas in the former entire communities change their position.” (Beteille, p. 190.)

<sup>13</sup>This figure would be somewhat higher if we included the sparsely populated north-eastern states.

<sup>14</sup>Some caste data was collected by the 1941 census but it was never tabulated—a combined effect of the World War and the volatile political situation in India.

<sup>15</sup>Caste figures in 1931 were compiled separately by each province in British India. There may be some duplication of castes within our group if listed names for the same caste vary across regions due to differences

for the increase in the proportion of Hindus after 1931. There was a significant migration of Muslims to the newly created nation of Pakistan at the time of Indian independence in 1947. For each of the two census years, 1971 and 1991, we scale the numbers in each caste group by the current population share of Hindus. This assumes that within Hindus, different castes grew at similar rates over time. While this is certainly not true of urban India, we hope that this is a reasonable approximation for rural areas. There is no systematic data on group-wise fertility and migration rates that might allow finer adjustments to these caste figures.

To measure caste and religious heterogeneity, we use the now popular fractionalization index,

$$h = 1 - \sum_1^n \gamma_i^2 \quad (1)$$

where  $\gamma_i$  refers to the population share of the  $i$ th group. In constructing this measure, we treat each Hindu caste as a separate group but assume that the other religious groups are internally homogenous. This is clearly an extreme assumption. There are caste divisions among Muslims and hierarchies within the Christians—but they are not religiously sanctioned and appear to be less politically salient.<sup>16</sup> There are also Hindu castes that work well together, but this is highly contextual and impossible to predict on *a priori* grounds.

The census has an eight-fold classification of religion; Hindus, five religious minorities, all other religions combined, and those who do not state their religion in a separate category. In constructing our measure we use shares of each of the six non-Hindu categories in addition to shares of each of our castes. For religions, the shares are contemporaneous and for castes, they are based on the 1931 data in the manner described above. Using this classification, our data confirm the idea that Indian society is extremely fragmented. Our measure of heterogeneity (the standard ethnic fractionalization index) ranges from 0.2 to nearly 1 and has a mean of .9 in 1971, compared to the mean value of .26 for U.S. cities reported by Alesina, Baqir and Easterly (1999).

We use historical caste data to construct measures of social heterogeneity rather than rely solely on the official categories currently used by the census because the influence of caste on both public goods and political activity in India is pervasive and measures of such het-

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in language, for example. This would however have little effect on the measures of social heterogeneity since these are computed for constituencies which only rarely cross the boundaries of British India provinces.

<sup>16</sup>Deliege (1999) discusses stratification within the Indian Christian community, pp. 157-163.

erogeneity based on the limited official categories are likely to be misleading. Village studies provide ample evidence that the use of water sources by different caste and religious groups is a continuing problem because of concerns of ritual purity and the sharing of public facilities like schools and health centers is also constrained by norms that limit the entry of lower castes into upper-caste neighborhoods. Political activity is typically associated with sharpening these divides.<sup>17</sup> Fukunaga (1993), in his study of village factions in Uttar Pradesh for example, describes how development projects introduced in the 1970s created large potential rents for the village headmen who administered them; this led to increased political activity that was almost always along group lines. Beteille (1969) in his classic study of a village in south India describes the way in which temples, meeting rooms and the elementary schools are strategically located to make access easy for particular castes.<sup>18</sup> This literature points to the importance of using measures of heterogeneity that are based on a socially relevant classification of groups.

### 3.3 Land Distribution

There are many discussions of land-based class politics in rural India. Mitra (1977) and more recently Varshney (1995) argue that agricultural policies in India reflect the growing political power of rural landlords. Banerjee and Iyer (2005) argue that land relations in colonial times continue to affect access to public goods in rural India.

No systematic data on land ownership is available at the district-level. We compute Gini coefficients of land inequality based on the number of operated landholdings in different size classes. These data are collected by the Agricultural Census of India every five years and published in *State Statistical Abstracts* by most states. We include agricultural labor and assign it zero holdings. Computed Gini coefficients across districts vary from 0.33 to an impressively high 0.89 in 1971. Over the 1971 to 1991 period there is very little change in the concentration of operated landholdings.<sup>19</sup>

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<sup>17</sup>“In Rampura in 1948, inter-caste relations were on the whole cooperative if not friendly...But with the introduction of adult franchise and of the electoral principle into panchayats and other local self-governing institutions, tensions between the castes increased sharply.” (Srinivas, 1996, p150.) Also see Singh (1993).

<sup>18</sup>“As the election campaign mounts, people tend to identify themselves progressively with one party or another. The cleavages within the village community are more sharply focused, and the links between political interest and social structure are brought to the surface.” (p. 179).

<sup>19</sup>All the 16 states which we consider have published land data for 1991, but only 7 of them have it for

### 3.4 Geography

Geographical terrain, average temperatures and rainfall are all likely to influence the need for different types of public goods and the ease with which they can be provided. Geography determines the cost and time taken to construct buildings and roads and often dictates whether the most suitable water source is a spring, a well or piped water.

The 1991 Census lists minimum and maximum temperatures for all urban agglomerations. For each district, we use temperatures for the district capital and average rainfall over the period 1940-1990 collected by the Indian Meteorological Department. We control for terrain by the fraction of the district's uncultivated area that is rocky, sandy and mountainous. These data are published by the Ministry of Rural Development and are based on satellite data put together by the National Remote Sensing Agency in India. These variables, by construction, do not vary over time. In addition, we use a dummy for constituencies that are located on the Indian coastline.

To control for population density we use the total number of villages and the average village population as explanatory variables. These are from the Census of India and are available for each census year.

### 3.5 Political Variables

To investigate whether political competition matters for public good delivery we use a measure of political fragmentation which is identical in construction to the fractionalization index in (1) except that it uses the vote share of various political parties rather than population shares of social groups. This type of measure is widely used in the literature on comparative politics (Rae, 1971).

There were general elections in 1971 and 1991. Butler, Lahiri and Roy (1991) tabulate electoral data for each of these years. In contrast to district boundaries, there have been relatively few changes in constituency boundaries since 1971.<sup>20</sup> For newly created constituen-

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1971- for these states we use figures from closest subsequent year for which they are available. As a result, our data might understate changes in land inequality over the 1971-1991 period.

<sup>20</sup>There were 518 constituencies in 1971. This number went up to 542 after a Delimitation order in 1976

cies, they assign vote shares from the parent constituencies for years prior to their creation. We use their data on vote shares to create our index.

The average vote share of the winning party in 1971 was 55% and the mean political fragmentation was .56. There was a rise in political fragmentation and a fall in the average vote share of the winning party over the seventies and eighties.

### 3.6 Mapping District Data into Parliamentary Constituencies

Since we are interested in the ability of communities to extract public goods from the political system, the natural unit of analysis should be defined by the electoral boundaries. We use constituencies that elect a single member of the national parliament. As discussed above, these boundaries have the additional advantage of remaining relatively unchanged over this period.

We use the district-level data described above to generate figures for 499 of the 543 constituencies that existed in 1991. We leave the state of Kashmir, which did not have a census in 1991 due to political unrest. We also leave out the sparsely populated north-eastern states as well as regions that were governed directly by the central government during the period of this study. This leaves us with 511 constituencies in the 15 largest states (with more than 95% of the country's population). Another twelve of these are entirely urban. We are therefore left with 499 constituencies covering the rural areas of the major states.

Constituency-level data was generated by weighting figures from component districts, weights based on the share the constituency's area coming from each of these districts. There are two main sources of error introduced in this process. First, we did not have accurate areas for constituencies and made the assignment by visually comparing maps of districts and constituencies. Second, the degree of urbanization varies across the district, and so if a district is split during our period, it is hard to make the 1971 and 1991 figures comparable. We arrived at our final map between districts and constituencies after a few iterations, in which we tried to bring the number of villages in the constituency in 1971 as close as possible to the 1991 number. Since there was very little change in the total number of villages over this period, we believe this improves the accuracy of our constituency level figures and makes

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and then to 543 in 1991.



them more comparable across the two census years.

## 4 Empirical Strategy

### 4.1 The specifications

Our basic model is quite standard in the literature on social heterogeneity and public goods.<sup>21</sup> We specify the following relationship:

$$y_{ijkt} = \alpha_{it} * \mathbf{p}_{jkt} + \gamma_{it} * \mathbf{x}_{jkt} + \beta_{it} e_{jkt} + \sigma_{it} * \mathbf{s}_k + \varepsilon_{ijkt} \quad (2)$$

where  $y_{ijkt}$  is the share of villages with the  $i^{th}$  public good in the  $j^{th}$  constituency in the  $k^{th}$  state in census year  $t$ ,  $\mathbf{p}_{jkt}$  is a set of population characteristics,  $\mathbf{x}_{jkt}$  a set of geographical controls,  $e_{jkt}$  captures our electoral fragmentation measure,  $\mathbf{s}_k$  is a vector of state dummy variables and  $\varepsilon_{ijkt}$  is a constituency and good-specific shock. Population characteristics include our social composition variables (the shares of Scheduled Castes and Tribes, Brahmans, principal religious minorities and the index of social fractionalization applied to all our caste and religious groups) and the Gini coefficient of land-holdings. We use our political fragmentation index as our main electoral outcome. Geographical characteristics comprise average village size, the number of villages in a constituency (in thousands), rainfall, minimum and maximum temperatures, terrain, and a dummy for coastal areas.

The share of the various groups enters this equation in two ways: First linearly, with a separate coefficient for each group. Second, as a part of the fractionalization index, where the share of each group enters as a squared term, and every group enters with the same coefficient. The first term is intended to capture the idea that different groups have different levels of influence or different tastes while the second captures the idea that the number of groups matters, with one large group being potentially more effective in getting public goods than many small groups. We are therefore only allowing the differences in the influences of different groups to apply to the linear term. While this is entirely along the lines of what is current in the literature, there is no compelling justification for doing this: It would clearly

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<sup>21</sup>See Alesina, Baqir and Easterly (1999) and others mentioned in Section 1.

be better to simply estimate a general function of the size of each group and the square of the size. We could then calculate the heterogeneity effect based on the estimated quadratic coefficients. The reason we do not do this is that our fragmentation measure is computed using a very large number of groups and we cannot estimate separate effects for each of them. Collapsing the groups into a few larger groups is reasonable as long as we only care about the linear terms (we just get one average effect for the group) but not if we are interested in the quadratic terms (since the square of the sum is not the sum of the squares). We compromise by collapsing the groups into a few larger aggregates when we estimate the linear term, and then estimating a single coefficient for the fractionalization index, which is computed using the entire set of groups.

We begin by estimating this relationship by ordinary least squares for the 1971 cross-section; this is exactly what the literature does. Since  $y_{ijkt}$  is a share, some type of non-linear model would have been a natural choice for estimating this relationship. The linear model is however more convenient: First it makes it is easier to interpret the coefficients. Second, given that both the 1971 and 1991 levels are captured by the same linear model, the change between the two years also follows a linear model, a feature that the non-linear models do not share. As a specification check we also estimate the cross-sectional relationship in 1971 using a logit model for grouped data and find similar results.

Under the assumption that the above relationship holds in both 1971 and 1991, we can difference them to get an equation in changes:

$$y_{ijkt+1} - y_{ijkt} = (\alpha_{it+1} - \alpha_{it}) * \mathbf{p}_{jkt} + \alpha_{it+1} * \Delta \mathbf{p}_{jkt} + (\gamma_{it+1} - \gamma_{it}) * \mathbf{x}_{jkt} + \gamma_{it+1} * \Delta \mathbf{x}_{jkt} + (\beta_{it+1} - \beta_{it})e_{jkt} + \beta_{it+1}\Delta e_{jkt} + (\sigma_{it+1} - \sigma_{it}) * \mathbf{s}_k + \varepsilon_{ijkt+1} - \varepsilon_{ijkt} \quad (3)$$

We do not however have values of  $\Delta \mathbf{p}_{jkt}$  and  $\Delta \mathbf{x}_{jkt}$  for all the variables in these categories. In particular, this is true for the share of Brahmans which is based entirely on data from 1931 and for some of the geographical controls as discussed in Section 3. We therefore omit these variables from  $\Delta \mathbf{p}_{jkt}$  and  $\Delta \mathbf{x}_{jkt}$ . In addition, we include the initial level of the public good in 1971,  $y_{ijk71}$ , to check for convergence in access over the 1971-1991 period. As mentioned, equalizing access to public goods was written large in the political agendas for this period and we're interested in the extent to which these were followed.<sup>22</sup> We therefore estimate:

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<sup>22</sup>In effect we are assuming that the 1971 level enters the 1991 level equation without a corresponding

$$\begin{aligned}
y_{ijk91} - y_{ijk71} = \Delta y_{ijk71} = & \xi_i y_{ijk71} + \hat{\alpha}_i * \mathbf{p}_{jk71} + \bar{\alpha}_{i91} * \Delta \mathbf{p}_{jk71} + \hat{\gamma}_i * \mathbf{x}_{jk71} + \bar{\gamma}_{i91} * \Delta \mathbf{x}_{jk71} \\
& + \hat{\beta}_i e_{jk71} + \bar{\beta}_{i91} \Delta e_{jk71} + \hat{\sigma}_i s_k + \hat{\varepsilon}_{ijk71}.
\end{aligned} \tag{4}$$

In principle, this model can provide us with estimates of both the coefficients on the variables of interest for 1991 and changes in these coefficients over the 1971 to 1991 period. Our model nests a model with a constituency-level fixed effect; so we control for any fixed characteristics that affect access to public goods in a political constituency. However, we do not impose the restriction that the coefficients are constant over time. Given an environment where political forces are getting radically realigned (this is the period when India goes from almost total domination by the Congress Party to a genuine multi-party state), it seems implausible that these coefficients would remain unchanged over these two decades.

## 4.2 Identification issues

We do not have a quasi-experiment here and the interpretation of our results depends on how far we succeed in establishing the exogeneity of our explanatory variables and in controlling for omitted sources of variation.

Since this is data from rural India and agricultural productivity is the mainstay of the rural economy, we estimate a specification where we include the average agricultural yield in the constituency over the 1956-61 period. There is an obvious danger of productivity being caused by the public goods outcomes, and we therefore use yield numbers from a period prior to our data on public goods.

The inclusion of a lagged dependent variable can be a source of bias and that what appears to be convergence in public good availability could simply reflect low realizations of the error term in 1971. To examine this possibility, we use as instruments the 1961 values of the public goods for which data is available for this year. These are limited in number, but these results suggest that the convergence is real.

Identifying the effects of social composition on public goods has been recognized as difficult term in the 1971 level equation –we are limited by the data we have.

because populations may move selectively to favorable public good locations. Group shares village size may therefore both be influenced by the availability of public goods. Permanent migration of families across rural India is low by most standards, but there are no disaggregated figures on migration that we can rely on for support. We therefore estimate a specification which excludes our population density variables and check for the robustness of our results.

In addition to selective migration by specific groups based on the availability of public goods, we are also worried about whether group identities get altered by the process of competition for public goods.<sup>23</sup> From this point of view it is a significant advantage that our caste figures are from the colonial census of 1931 and pre-date (by several decades), the expansion in public goods, which we cannot however use historical figures for some of the other categories. The shares of the different religions changed enormously after the partition in 1947 and the categories of Scheduled Castes and Scheduled Tribes were defined only after political independence.

We also experiment with excluding our political fragmentation measure on the grounds that electoral outcomes are more likely to be endogenous than demographic structures in our context. Finally, it is worth noting that we do not control for the two historical variables emphasized in Banerjee (2004)—the type of land tenure system established by the British in the constituency, and whether the constituency was under direct British rule.<sup>24</sup> The reason is that neither of these vary over time.

### 4.3 The problem of substitution

Even if we correctly estimate the effect of our explanatory variables, we need to address the problem of substitution across public goods. Even neglected populations may not get less of every public good- they may simply be given less valuable goods. Villages without piped water for example, may use springs, wells and tanks as water sources. Conversely, villages without access to a hospital may receive some type of less elaborate health facility for reasons

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<sup>23</sup>Beteille (1969) remarks on the fact that social cleavages are heightened when villages participate in political activity.

<sup>24</sup>The land tenure variable was emphasized by Banerjee and Iyer (2005), while the non-British variable is from Iyer (2003).

of equity or as part of a political mechanism aimed at pacifying them.

This kind of substitution is a problem for this entire literature. To take an example, Alesina, Baqir and Easterly (1999), who were the first to run this kind of regression on micro data, found evidence of substitution in their data: ethnic diversity in the U.S. leads to a reduction in spending on sewerage and trash pickup, education, welfare, fire protection and roads, but it leads to an *increase* in spending on health and police and it is not clear that those are less useful.<sup>25</sup>

Such substitution is probably less of a problem for our exercise because we use the share of villages in a constituency that have a particular public good rather than budget shares. Shares of spending in different categories clearly have added up to one whereas, given that most villages had very little access to many of these facilities in 1971, a favored constituency could have gained along multiple dimensions over the next twenty years. Indeed as we will note later, densely populated areas have more of almost all public goods.

One approach to this problem using Indian data, suggested in Banerjee and Somanathan (2001), is to exploit the fact that the Scheduled Tribes in India tend to be the single weakest political group and are unlikely to have much access to the coveted public goods. If we would like to study access to the most desirable public goods, we could focus on the goods for which the Scheduled Tribe coefficient is significantly negative in the 1971 level regressions. The results for this subset of goods, it can be checked from the tables, are very similar to those for the entire group for which we have data.

## 5 Results

### 5.1 1971 Estimates

The results from estimating (2) are reported in Tables 2a-2d. Table 2a reports on the three types of schools, Table 2b on the five health facilities, Table 2c on the three water sources and Table 2d reports on power, transport and communication facilities. For brevity, we

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<sup>25</sup>The fact other studies do not find similar evidence of substitution might reflect their focus on small subsets of public goods.

discuss only those coefficients that are statistically significant at the 10% level. To interpret the results on the presence of the various social groups, note that the excluded category is the group of Hindus that are not Brahmans, Scheduled Castes or Scheduled Tribes.

Our estimates for 1971 underline the disadvantaged position of the Scheduled Tribes. Of the fifteen goods we consider, the coefficient on share of Scheduled Tribes is negative in ten cases. Areas with concentrations of Scheduled Tribes have less of all schools above the primary level, all water sources and all power, transport and communications facilities. Areas with Scheduled Castes and Muslims also appear disadvantaged relative to our reference group, although to a lesser extent, while Christians do better. Brahmans are associated with more of all the goods we would expect them to especially value given their traditional role as the repositories of written knowledge—all types of schools and post offices.

Caste and religious fragmentation is negative in six cases and positive in two. The coefficient on the Gini Index is positive in eight cases and never negative; so areas that were more unequal in 1971 had better access to public goods. Political fragmentation does not seem to have a clear-cut effect: The estimated coefficient is positive and negative in equal numbers of cases (two each).

Population density has a very strong positive effect on access to public goods, suggesting that ease of delivery may be an important part of the decision to provide public goods: Clearly it is easier to serve a lot of people when they are all in one place. For almost all goods, constituencies with larger villages are better served. This may also reflect the influence of explicit norms set out in the Five Year Plans relating the provision of each type of facility to settlements of a certain size.

## 5.2 Estimates based on 1971-1991 differences

Results from estimating the differenced model (4) are reported in Tables 3a-3e: The division of the goods parallels that in Table 2.

The estimated coefficients on the differences in our explanatory variables,  $\bar{\alpha}_i$ ,  $\bar{\beta}_i$  and  $\bar{\gamma}_i$ , provide us with the effects of these variables in 1991, while those on the 1971 levels of these variables reflect the changes in these effects over the two decades. Both sets are

reported in Tables 3a-3d. Results on convergence are in Table 3e. There is strong evidence of convergence in public good availability over this period. The 1971 level of the good is negative and significant in 12 of the 15 goods and positive in one.

A comparison of our results for 1971 (Table 2) and those for 1991 (Table 3) is not of course straightforward. Our estimates for 1991 have the advantage of controlling for constituency-level fixed effects. On the other hand, they are identified based on relatively small changes in our explanatory variables, which are themselves imperfectly measured, and are therefore imprecisely estimated. The few cases in which both the estimated coefficient for 1991 and the estimated change in this coefficient are statistically significant, a comparison of these numbers with the 1971 estimates suggests no obvious inconsistency. Consider, as an example, the effect of the social fractionalization index on middle and high schools: The estimated effects for both 1971 and 1991 are negative, the 1991 estimates are considerably larger, and the estimated change is negative. In fact, there are very few cases in which we can formally reject the hypothesis that two sets of results are consistent with each other. However this is clearly in part because some of our coefficients are very loosely estimated. Therefore we are not in a position to take a general stand on whether the difference between these results reflects a real change or whether it is an artifact of the particular statistical methodology adopted.

In 1991, social fragmentation has no systematic effect unlike in 1971 where it was negative: the coefficients are negative for 3 goods and positive for two. On the other hand, the estimated effect of land inequality has systematically switched sign—the coefficient on the Gini Index is negative in five cases and positive in two in 1991— whereas it was emphatically positive in 1971.

Political fragmentation in 1991, as in 1971, does not systematically affect the provision of most goods. This finding is notable, given the fact the political divisions often mirror caste and religious divides and these do seem to matter. It may be that political fragmentation has opposing effects: To the extent that it reflects social fragmentation we might expect its effect to be negative, while if it results from exogenous variation in the extent of political competition, we would expect it to have a positive effect. Political fragmentation could also reflect a government that is sustained by a coalition of parties and is therefore unstable, weak and ineffective. On balance it is not clear which way the net effect should go.

The most striking difference in our estimates for the two census years relates to gains registered by the Scheduled Castes relative to other groups. Higher shares of Scheduled Castes in 1991 are associated with more high schools, health centres, dispensaries and piped water. While we cannot say whether the difference between the two years is because the 1971 results were systematically biased by the absence of a district fixed effect, the fact that the Scheduled Castes are actually doing better than the rest in 1991 is interesting in itself, given the history of discrimination against them.

By contrast, Scheduled Tribes, Muslims, Christians and Brahmans experienced either a decline or little change in access to most goods relative to the control group. Scheduled Tribes in particular remained disadvantaged in 1991 with fewer middle schools, phones, paved roads and family planning centres.

Table 5 reports, for each public good, the two variables that have the largest impact on access to that good, where impact is measured by one standard deviation of each explanatory variable (in 1991 levels) multiplied by the estimated coefficient for 1991.<sup>26</sup> For 12 of the 15 goods, the most important determinant of 1971-1991 change in provision is the initial level of access, and in all but one case (piped water) this effect is negative, implying convergence over this period. Moreover, convergence effect is typically many times that of the next biggest influence.

### 5.3 Robustness

Table 4 reports results from a number of attempts to check the robustness of the conclusions drawn above. Many of the additional variables introduced for this purpose are available for a limited set of parliamentary constituencies, which is why we have not exploited them in our main specification.

The first two columns of the table reproduce (from Table 3) estimated coefficients for the two variables for which we get the most striking results—the share of Scheduled Tribes and the 1971 level of access. The other columns contain estimated effects for these two variables under each of the alternative specifications described below.

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<sup>26</sup>This is only done for explanatory variables with statistically significant coefficient estimates.



Our first check is to include a control for the average agricultural yield in the constituency as an additional explanatory variable in (4). This was constructed using district-level data from the India Agriculture and Climate Data Set assembled by the World Bank. Yields are an important determinant of economic power in rural areas and therefore a potentially important influence on access to public goods. To minimize the risk of over-controlling (yield, after all, is affected by the presence of many of the public goods), we use the average yield from the 1956 to 1961 period which predates the change in public goods, our dependent variable. The yield itself comes in negative, consistent with the convergence we observe over this period. The results, for both our focal variables, are very similar to those in columns 1 and 2. The point estimates have the same sign and are similar in magnitude.

A second check is to instrument for the 1971 level of the public good in (4) by the corresponding level in 1961. This addresses the problem of mean-reversion discussed above. The results are in columns 5 and 6 for the seven goods for which we have 1961 data.<sup>27</sup> We clearly lose precision by restricting ourselves to a much smaller number of constituencies, but most of the estimated coefficients on the 1971 level (which measures convergence) in column 6 have the same sign as the ones in column 2, and are usually larger in absolute value. The fact that they are larger is a bit puzzling—if there was mean reversion, we would have expected the IV to be closer to zero than the OLS. One possible explanation is that the 1961 levels had a direct effect on the rate of convergence between the 1971 and 1991. It may be that at the time that districts were tagged as “backward” in the early seventies and therefore deserving of extra investment, the 1971 numbers were not yet available and the 1961 ones were what policymakers used.

Column 5 reports the Scheduled Tribe results for the case where we instrument for the 1971 level. It turns out that we unfortunately have data only for one of the six goods where the variable is significant in column 1; in that one case, the results in columns 1 and 5 are very similar indeed.

Columns 7 and 8 report results on a specification in which we drop both average village population and the number of villages in a constituency. Our qualitative results are mostly

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<sup>27</sup>We left out all the goods for which we could not find 1961 data for at least 225 districts and at least 12 states. The problem is partly patchy coverage (which is why many districts are missing) and partly lack of a standard definition (which is why some states are missing—we suspect that the corresponding public good is called something else in those states).

intact. The Scheduled Tribes coefficient is negative in five cases (with one difference in the set of goods for which this is the case) and positive in the same one good—health centers. Convergence is seen in ten of the fifteen goods we have in 1971.

We performed a number of other specification checks, not reported in the tables. We replaced the political fragmentation variable with the vote share of the winning party and the gap between the largest and second largest vote shares in each constituency. None of these have better explanatory power than the fragmentation variable. Finally, we try a specification without any of the electoral variables, on the grounds that they might be endogenous. The other results remain almost entirely unaffected.

## **5.4 Scheduled Caste - Scheduled Tribe asymmetries**

Our results suggest that the one significant section of Indian society that seems unambiguously disadvantaged are the Scheduled Tribes. This contrasts with the other designated disadvantaged group, the Scheduled Castes, who seem to be doing quite well in recent years. The fact that areas with Scheduled Tribes have lower access to public goods in 1991 could result from their living in relatively remote regions of the country and in areas where there are relatively few non-tribals, while Scheduled Castes live with other, more powerful, groups. This cannot however be the entire story since Scheduled Caste areas actually do better than the average constituency in 1991.

There is also some direct evidence of the greater success of Scheduled Castes (not Scheduled Caste areas) relative to Scheduled Tribes (once again not Scheduled Tribe areas). Pande(2003), using data on reservations and policy outcomes across the Indian states, finds that Scheduled Castes have benefitted from affirmative action policies, while Scheduled Tribes have not.

Were the observed difference in public good access between these two groups reflected in the political domain? Historically, Indian politics has been dominated by the Indian National Congress Party. The Congress has always publicly supported policies that favor Scheduled Castes and Scheduled Tribes, and has legislated and implemented much of the legally mandated affirmative action that is in existence today. However, the leadership of the party has

remained in the hands of the upper and middle castes.<sup>28</sup> It has been argued that in the face of this continuing elite dominance, the Scheduled Castes looked increasingly for a political presence outside the Congress. A major political party under Scheduled Caste leadership (BSP) was formed in the mid-1980s and came to rule India's most populous state in the 1990s. In contrast, Tribal parties have had limited political success, even in constituencies where the Scheduled Tribes are a majority.<sup>29</sup> This suggests the possibility that Scheduled Castes did better because they abandoned the Congress and established an independent political presence in their areas.

We look at a more micro level at whether there is actually a difference in the voting behavior of these two groups. We use the fact that there are constituencies reserved for Scheduled Caste and Tribe candidates in the national parliament and these constituencies are distributed roughly in the proportion of that group in the population of a particular area. We first examine the performance of the Congress in constituencies reserved for Scheduled Caste and Scheduled Tribe candidates relative to unreserved constituencies, and ask whether the pattern of Congress success changed between the elections in 1971 and those in 1991. Then we estimate, using a logit model, the probability that the Congress wins, as a function of the constituency-level shares of these groups, other religious minorities and state-level fixed-effects. Our dependent variable is binary, taking the value of 1 if the Congress Party wins in the constituency. Explanatory variables are shares of Scheduled Castes, Scheduled Tribes, Muslims, Christians and dummy variables for each state.

We find that in 1971, the Congress won a majority of total seats as well as those within each reserved category. It won two-thirds of unreserved seats, 68 per cent of those reserved for Scheduled Castes, and 77 per cent of those reserved for the Scheduled Tribes. In 1991, it had 43 per cent of all unreserved seats and 41 per cent of the Scheduled Caste seats but maintained two-thirds of the Scheduled Tribe seats. Our logit estimates tell much the same story. In 1971, neither concentrations of religious minorities nor the Scheduled Castes and Tribes had any systematic influence on Congress success. In 1991, while all other minority groups showed no systematic bias either toward or against the Congress, the Scheduled Tribes appear to favor it systematically. The marginal effects here are sizeable. A one-standard

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<sup>28</sup>As Paul Brass notes: “..the dominant Congress party continues to blur and distort issues by drawing its support from the poor and the rich, by taking votes and providing benefits to the poor while relying for local leadership and control on the rich and the landed of elite caste.” (Brass, 1983, p.15.)

<sup>29</sup>See Chandra (2004).

deviation change in the share of Scheduled Tribes increases the probability of a Congress win by 0.1. These exercises, though fairly crude, suggest that the Scheduled Tribes might have lacked the kind of political leadership that helped the Scheduled Castes move ahead during our period.

## 6 Conclusion

Our study suggests that while social divisions are indeed important, they need not be immutable structures that freeze the economy into permanent underdevelopment. Indian society is among the most divided anywhere, and the roots of these divisions go back thousands of years. Yet there has been progress towards equalization, as evidenced by the broad convergence in access to even those public goods that remain relatively scarce in rural India.

Benefits of this expansion in public goods were unevenly distributed among the disadvantaged. In the 1980s the Scheduled Castes established a successful caste-based party and significantly increased their representation in national politics. Our work suggests that they were also able to extract public resources from the state. Muslims, who have long been recognized as socially disadvantaged but have never been the recipients of state-led affirmative action do not seem to have benefitted in the same way. The Scheduled Tribes, whom Myron Weiner refers to as India's *largest politically slumbering minority*,<sup>30</sup> diverged from the rest of society over the period we study. It is possible, however, that this period of Scheduled Tribe backwardness has now ended with the creation of two separate, Scheduled Tribe dominated, states; Jharkhand and Chattisgarh and the greater success of tribal leadership in the recent parliamentary elections.

This may, however, be too optimistic a view of the evidence. Convergence has taken place in outcomes that are relatively easy to deliver. Schools are easy to build and new buildings and more teachers can offer bureaucrats opportunities to distribute patronage. Hiring good teachers or getting them to teach well is harder. A similar analysis of the welfare outcomes that are affected by these public goods might suggest a very different picture, because, for example, empty school buildings do not improve education.

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<sup>30</sup>Weiner (1989), p. 53.

One piece of evidence we can use to address this issue is the evidence on literacy. A regression of the change in literacy at the constituency level between 1971 and 1991 on the same set of right-hand-side variables as the ones used in the basic differenced regression, suggests results that are closely aligned with our public good results: Scheduled Tribe areas are falling behind in literacy as well, while Scheduled Castes appear to be improving. Clearly this is just one piece of evidence, and literacy is probably the one welfare outcome that is relatively easily changed. Other measures of education may be much more sensitive to the quality of education that is being provided.

It is clearly too early to declare victory over the forces of historical inequity in India, at least in terms of access to public goods. On the other hand, our work does suggest that getting the state to make explicit commitments may be important in fighting these inequities; commitments that will increasingly have to be based on the quality of these goods rather than on physical access.

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Table 1a: The Proportion of Indian Villages with Public Goods, 1971-1991.

	1971	1991
Primary Schools	0.53 (0.20)	0.73 (0.16)
Middle Schools	0.08 (0.17)	0.19 (0.20)
High Schools	0.04 (0.13)	0.08 (0.16)
Health Centers	0.01 (0.04)	0.01 (0.02)
Dispensaries	0.03 (0.15)	0.03 (0.10)
Hospitals	0.01 (0.06)	0.02 (0.05)
Maternity and Child Welfare Centers	0.01 (0.05)	0.02 (0.06)
Family Planning Centers	0.01 (0.10)	0.02 (0.07)
Piped Water	0.02 (0.07)	0.18 (0.24)
Water Tanks	0.13 (0.17)	0.14 (0.21)
Wells	0.78 (0.22)	0.70 (0.29)
Electricity	0.18 (0.26)	0.70 (0.25)
Post Offices	0.15 (0.18)	0.22 (0.24)
Phone Collections	0.01 (0.07)	0.06 (0.16)
Paved Roads	0.25 (0.19)	0.37 (0.25)
Number of Villages	551640	565092

Notes: The proportions for each good are taken directly from the Census of India. The figures in parentheses are standard deviations over parliamentary constituencies based on the constituency level data described in section 3. The last row gives the number of villages in our dataset.

Table 1b: Access to Selected Public Goods by State, 1971.

State	Primary Schools	High Schools	Hospitals	Piped Water	Electricity	Telephones	Paved Roads
Andhra Pradesh	0.70 (0.16)	0.07 (0.04)	0.01 (0.005)	0.01 (0.02)	0.25 (0.14)	0.01 (0.02)	0.28 (0.13)
Assam	0.61 (0.06)	0.02 (0.01)	0.05 (0.03)	0.02 (0.01)	0.03 (0.02)	0.01 (0.01)	0.20 (0.05)
Bihar	0.48 (0.11)	0.03 (0.02)	0.00005 (0.0001)	0.0003 (0.0002)	0.15 (0.13)	0.01 (0.01)	0.24 (0.05)
Gujarat	0.85 (0.09)	0.07 (0.06)	0.01 (0.01)	0.12 (0.11)	0.13 (0.09)	0.04 (0.06)	0.28 (0.10)
Haryana	0.65 (0.09)	0.09 (0.04)	0.03 (0.01)	0.05 (0.04)	1.00 (0.003)	0.03 (0.01)	0.56 (0.09)
Himachal Pradesh	0.20 (0.10)	0.02 (0.01)	0.01 (0.002)	0.15 (0.11)	0.22 (0.03)	0.003 (0.003)	0.15 (0.02)
Karnataka	0.63 (0.09)	0.04 (0.03)	0.00 (0.003)	0.01 (0.01)	0.40 (0.15)	0.03 (0.04)	0.41 (0.10)
Kerala	0.95 (0.05)	0.56 (0.17)	0.20 (0.14)	0.20 (0.08)	0.87 (0.12)	0.31 (0.13)	0.99 (0.01)
Maharashtra	0.81 (0.12)	0.09 (0.05)	0.00 (0.002)	0.02 (0.03)	0.34 (0.10)	0.01 (0.01)	0.24 (0.07)
Madhya Pradesh	0.44 (0.08)	0.01 (0.004)	0.01 (0.004)	0.004 (0.01)	0.04 (0.03)	0.002 (0.01)	0.20 (0.07)
Orissa	0.52 (0.09)	0.03 (0.02)	0.00 (0.002)	0.01 (0.004)	0.03 (0.02)	0.01 (0.003)	0.18 (0.07)
Punjab	0.57 (0.11)	0.05 (0.02)	0.01 (0.003)	0.003 (0.01)	0.49 (0.15)	0.01 (0.004)	0.41 (0.04)
Rajasthan	0.48 (0.12)	0.02 (0.01)	0.02 (0.01)	0.01 (0.01)	0.08 (0.04)	0.02 (0.01)	0.17 (0.05)
Tamil Nadu	0.77 (0.06)	0.09 (0.10)	0.02 (0.04)	0.09 (0.07)	0.66 (0.16)	0.02 (0.05)	0.54 (0.14)
Uttar Pradesh	0.39 (0.14)	0.01 (0.01)	0.01 (0.01)	0.03 (0.05)	0.19 (0.14)	0.002 (0.003)	0.25 (0.07)
West Bengal	0.60 (0.13)	0.06 (0.03)	0.01 (0.03)	0.01 (0.03)	0.03 (0.06)	0.01 (0.02)	0.25 (0.09)

Notes: The state-level proportions for each good are from the occasional paper published by the Census of India (1987). Standard deviations over parliamentary constituencies in each state are in parentheses.

**Table 2a: Access to Education, 1971.**  
 Results from the estimation of (2) by OLS  
 Dependent Variable: Fraction of villages with the public good in 1971.

	Primary Schools	Middle Schools	High Schools
Social Fragmentation	<b>-0.24</b> ** (0.08)	0.05 (0.07)	<b>-0.07</b> ** (0.03)
Land Inequality	<b>0.18</b> ** (0.07)	<b>0.14</b> ** (0.03)	0.02 (0.02)
Scheduled Tribes	-0.02 (0.04)	<b>-0.08</b> ** (0.02)	<b>-0.05</b> ** (0.01)
Scheduled Castes	0.10 (0.08)	<b>-0.19</b> ** (0.05)	<b>-0.04</b> ** (0.02)
Brahmans	<b>0.49</b> ** (0.18)	<b>0.15</b> * (0.09)	<b>0.10</b> ** (0.03)
Muslims	-0.10 (0.07)	0.01 (0.03)	<b>-0.07</b> ** (0.02)
Christians	-0.06 (0.11)	-0.11 (0.09)	<b>0.29</b> ** (0.06)
Sikhs	0.04 (0.18)	0.05 (0.08)	<b>-0.08</b> ** (0.04)
Average Village Population	<b>0.02</b> ** (0.004)	<b>0.03</b> ** (0.004)	<b>0.03</b> ** (0.002)
Number of Villages	<b>-0.10</b> ** (0.01)	<b>-0.02</b> ** (0.00)	<b>-0.004</b> ** (0.00)
Political Fragmentation	0.03 (0.06)	<b>0.05</b> * (0.02)	<b>-0.02</b> * (0.01)
R-squared	0.82	0.92	0.97

Notes: See Section 4 for a complete list of included variables. Huber-White robust standard errors in parentheses. Coefficients that are marginally significant may not appear so due to rounding. The average village population and the number of villages are expressed in thousands.

**Table 2b: Access to Health Facilities, 1971.**

Results from the estimation of (2) by OLS

Dependent Variable: Fraction of villages with the public good in 1971.

	Health Centres	Dispensaries	Hospitals	Maternity/Child Centres	Family Planning Centres
Social Fragmentation	<b>-0.03</b> *	-0.01 (0.02)	-0.03 (0.02)	<b>0.07</b> ** (0.02)	<b>-0.05</b> ** (0.02)
Land Inequality	-0.02 (0.02)	-0.01 (0.02)	-0.01 (0.01)	-0.03 (0.02)	0.03 * (0.02)
Scheduled Tribes	0.0003 (0.01)	<b>-0.05</b> ** (0.01)	-0.004 (0.01)	0.0005 (0.01)	-0.01 (0.01)
Scheduled Castes	-0.02 (0.01)	<b>-0.05</b> ** (0.02)	<b>0.06</b> ** (0.02)	<b>-0.02</b> * (0.01)	0.01 (0.01)
Brahmans	<b>0.03</b> *	0.03 (0.03)	<b>-0.07</b> ** (0.03)	-0.03 (0.02)	0.03 (0.02)
Muslims	0.01 (0.01)	<b>-0.04</b> ** (0.02)	<b>-0.08</b> ** (0.02)	-0.001 (0.01)	-0.01 (0.01)
Christians	0.04 (0.05)	<b>0.19</b> ** (0.05)	<b>0.17</b> ** (0.05)	-0.05 (0.07)	-0.02 (0.09)
Sikhs	-0.02 (0.02)	-0.03 (0.03)	<b>-0.05</b> ** (0.02)	<b>0.05</b> * (0.03)	<b>-0.06</b> ** (0.02)
Average Village Population	<b>0.01</b> ** (0.004)	<b>0.02</b> ** (0.002)	<b>0.02</b> ** (0.002)	<b>0.02</b> ** (0.003)	<b>0.01</b> ** (0.005)
Number of Villages	<b>-0.003</b> ** (0.001)	<b>-0.004</b> ** (0.002)	<b>0.003</b> ** (0.001)	<b>0.003</b> ** (0.001)	-0.001 (0.002)
Political Fragmentation	-0.002 (0.01)	<b>-0.03</b> ** (0.01)	0.01 (0.01)	0.004 (0.01)	-0.01 (0.01)
R-squared	0.85	0.98	0.93	0.87	0.96

Notes: See Table 2a.

**Table 2c: Access to Water Sources, 1971.**

Results from the estimation of (2) by OLS

Dependent Variable: Fraction of villages with the public good in 1971.

	Wells	Piped Water	Tanks
Social Fragmentation	<b>0.32</b> *	<b>-0.14</b> **	<b>-0.18</b> *
	(0.19)	(0.07)	(0.11)
Land Inequality	0.06	<b>0.08</b> **	-0.04
	(0.10)	(0.03)	(0.10)
Scheduled Tribes	<b>-0.15</b> **	<b>-0.04</b> *	<b>-0.14</b> **
	(0.06)	(0.02)	(0.06)
Scheduled Castes	0.01	<b>-0.08</b> **	<b>-0.16</b> *
	(0.16)	(0.03)	(0.09)
Brahmins	<b>-0.89</b> **	<b>0.11</b> *	-0.40
	(0.38)	(0.07)	(0.29)
Muslims	0.12	<b>-0.11</b> **	<b>-0.29</b> **
	(0.13)	(0.03)	(0.11)
Christians	0.11	<b>0.24</b> **	<b>0.25</b> **
	(0.13)	(0.05)	(0.12)
Sikhs	<b>-1.11</b> **	-0.08	-0.16
	(0.47)	(0.08)	(0.19)
Average Village Population	0.00003	<b>0.01</b> **	0.003
	(0.003)	(0.002)	(0.01)
Number of Villages	-0.01	-0.002	-0.01
	(0.02)	(0.01)	(0.01)
Political Fragmentation	<b>0.31</b> **	-0.02	0.03
	(0.10)	(0.02)	(0.06)
R-squared	0.63	0.74	0.56

Notes: See Table 2a.

Table 2d: Access to Power, Transport and Communication Facilities, 1971.

Results from the estimation of (2) by OLS

Dependent Variable: Fraction of villages with the public good in 1971.

	Electricity	Phone Connections	Post Offices	Paved Roads
Social Fragmentation	-0.13 (0.11)	-0.03 (0.02)	0.03 (0.09)	-0.02 (0.08)
Land Inequality	<b>0.29</b> ** (0.09)	<b>0.05</b> ** (0.02)	<b>0.27</b> ** (0.06)	<b>0.28</b> ** (0.07)
Scheduled Tribes	<b>-0.14</b> ** (0.04)	<b>-0.05</b> ** (0.01)	<b>-0.14</b> ** (0.03)	<b>-0.07</b> ** (0.03)
Scheduled Castes	<b>0.18</b> ** (0.09)	-0.004 (0.02)	<b>-0.24</b> ** (0.07)	-0.06 (0.07)
Brahmins	<b>-0.57</b> ** (0.20)	-0.02 (0.03)	<b>0.27</b> ** (0.13)	0.07 (0.15)
Muslims	<b>-0.19</b> ** (0.07)	<b>-0.06</b> ** (0.02)	0.04 (0.05)	-0.003 (0.05)
Christians	<b>0.31</b> ** (0.16)	<b>0.30</b> ** (0.05)	-0.04 (0.17)	-0.05 (0.13)
Sikhs	-0.14 (0.23)	-0.02 (0.03)	0.08 (0.15)	-0.07 (0.16)
Average Village Population	<b>0.01</b> ** (0.01)	<b>0.02</b> ** (0.00)	<b>0.02</b> ** (0.01)	<b>0.02</b> ** (0.01)
Number of Villages	<b>-0.04</b> ** (0.01)	<b>-0.0017</b> ** (0.0014)	<b>-0.05</b> ** (0.01)	<b>-0.04</b> ** (0.01)
Political Fragmentation	-0.06 (0.06)	0.002 (0.01)	0.02 (0.05)	-0.05 (0.04)
R-squared	0.85	0.93	0.84	0.86

Notes: See Table 2a.

Table 3a: Access to Education, 1971-1991.  
 Results from the estimation of (4) by OLS  
 Dependent Variable: The 1971-1991 change in the fraction of villages with the public good.

	Primary Schools		Middle Schools		High Schools	
	1991	change	1991	change	1991	change
Social Fragmentation	-0.15 (0.12)	0.008 (0.06)	<b>-0.35 **</b> (0.16)	<b>-0.209 **</b> (0.06)	<b>-0.30 **</b> (0.09)	-0.057 (0.04)
Land Inequality	0.09 (0.07)	0.004 (0.04)	-0.17 ** (0.06)	-0.03 (0.04)	-0.06 (0.05)	0.018 (0.02)
Scheduled Tribes	0.11 (0.08)	<b>0.07 **</b> (0.03)	<b>-0.21 **</b> (0.09)	-0.04 (0.03)	0.01 (0.04)	-0.024 (0.02)
Scheduled Castes	-0.02 (0.12)	-0.03 (0.06)	-0.12 (0.12)	0.014 (0.07)	<b>0.16 **</b> (0.08)	<b>-0.061 **</b> (0.03)
Brahmans		0.153 (0.12)		0.187 (0.08)		-0.019 (0.06)
Muslims	0.14 (0.17)	0.007 (0.04)	-0.09 (0.17)	<b>-0.127 **</b> (0.05)	<b>-0.23 **</b> (0.09)	-0.032 (0.03)
Christians	0.11 (0.22)	-0.003 (0.07)	<b>-0.701 **</b> (0.33)	0.008 (0.09)	-0.116 (0.30)	<b>-0.286 **</b> (0.10)
Sikhs	0.04 (0.13)	<b>-0.228 **</b> (0.09)	0.24 (0.32)	-0.12 (0.13)	-0.061 (0.19)	-0.074 (0.09)
Average Village Population	<b>0.01 **</b> (0.00)	-0.003 (0.002)	<b>0.01 **</b> (0.00)	<b>0.01 **</b> (0.004)	<b>0.01 **</b> (0.01)	0.01 (0.01)
Number of Villages	<b>-0.18 **</b> (0.03)	<b>-0.037 **</b> (0.01)	-0.03 (0.03)	<b>-0.034 **</b> (0.01)	-0.004 (0.01)	<b>-0.01 **</b> (0.003)
Political Fragmentation	0.05 (0.04)	0.009 (0.05)	<b>-0.12 **</b> (0.05)	-0.08 (0.05)	0.01 (0.02)	<b>0.04 *</b> (0.02)
R-squared	0.73		0.72		0.73	

Notes: See Section 4 for a complete list of included variables. Huber-White robust standard errors in parentheses. Coefficients that are marginally significant may not appear so due to rounding, and vice-versa.

Table 3b: Access to Health Facilities, 1971-1991.

Results from the estimation of (4) by OLS

Dependent Variable: the 1971-1991 change in the fraction of villages with the public good.

	Health Centres		Dispensaries		Hospitals		MCCs		FPCs	
	1991	change	1991	change	1991	change	1991	change	1991	change
Social Fragmentation	-0.01 (0.02)	<b>-0.019**</b> (0.01)	0.03 (0.06)	<b>-0.063*</b> (0.04)	0.03 (0.04)	<b>-0.039*</b> (0.02)	-0.04 (0.06)	0.006 (0.02)	-0.01 (0.06)	-0.014 (0.02)
Land Inequality	<b>-0.05*</b> (0.03)	-0.005 (0.01)	<b>-0.12**</b> (0.04)	<b>-0.051**</b> (0.02)	<b>0.05*</b> (0.03)	-0.027 (0.02)	-0.002 (0.04)	0.025 (0.03)	0.01 (0.04)	<b>0.069**</b> (0.03)
Scheduled Tribes	<b>0.03**</b> (0.01)	<b>-0.007*</b> (0.0004)	-0.03 (0.03)	0.011 (0.01)	-0.03 (0.02)	0.003 (0.01)	0.01 (0.02)	0.014 (0.01)	<b>-0.09**</b> (0.03)	<b>-0.039**</b> (0.01)
Scheduled Castes	<b>0.04*</b> (0.02)	0.014 (0.01)	<b>0.12**</b> (0.05)	0.02 (0.02)	0.02 (0.03)	<b>0.041**</b> (0.02)	0.02 (0.04)	-0.021 (0.03)	-0.02 (0.04)	<b>-0.051**</b> (0.02)
Brahmans		-0.062 (0.04)		-0.004 (0.04)		0.007 (0.02)		0.064 (0.07)		0.05 (0.06)
Muslims	-0.02 (0.03)	<b>-0.015**</b> (0.01)	-0.05 (0.07)	0.034 (0.02)	0.04 (0.04)	<b>-0.036**</b> (0.01)	-0.04 (0.07)	0.035 (0.02)	-0.02 (0.06)	-0.022 (0.02)
Christians	0.06 (0.07)	<b>0.051**</b> (0.02)	-0.199 (0.20)	-0.08 (0.08)	0.071 (0.13)	0.023 (0.07)	0.245 (0.17)	0.10 (0.08)	<b>0.429**</b> (0.17)	<b>0.187**</b> (0.06)
Sikhs	0.014 (0.04)	-0.014 (0.02)	0.05 (0.09)	0.012 (0.07)	0.002 (0.07)	0.047 (0.03)	-0.03 (0.06)	0.01 (0.04)	0.008 (0.06)	0.006 (0.04)
Average Village Pop	0.00 (0.00)	<b>0.002**</b> (0.001)	<b>0.007*</b> (0.00)	<b>0.01*</b> (0.004)	0.00 (0.00)	<b>0.02**</b> (0.003)	0.000 (0.00)	0.002 (0.004)	0.00 (0.00)	-0.004 (0.003)
Number of Villages	-0.004 (0.01)	-0.001 (0.001)	-0.01 (0.01)	-0.003 (0.002)	<b>-0.02**</b> (0.01)	0.001 (0.001)	0.00 (0.01)	-0.003 (0.002)	-0.01 (0.01)	<b>-0.01**</b> (0.002)
Political Fragmentation	0.01 (0.01)	0.007 (0.01)	-0.01 (0.02)	0.006 (0.02)	-0.01 (0.01)	-0.008 (0.01)	-0.02 (0.02)	-0.03 (0.03)	-0.01 (0.02)	0.014 (0.02)
R-squared	0.86		0.72		0.63		0.49		0.85	

Notes: See Section 4 for a complete list of included variables. Huber-White robust standard errors in parentheses.



**Table 3c: Sources of Water, 1971-1991.**  
 Results from the estimation of (4) by OLS  
 Dependent Variable: the 1971-1991 change in the fraction of villages with the public good.

	Wells		Piped Water		Water Tanks	
	1991	change	1991	change	1991	change
Social Fragmentation	-0.45 (0.38)	<b>0.405 **</b> (0.16)	-0.02 (0.33)	<b>-0.332 **</b> (0.13)	0.10 (0.30)	0.025 (0.07)
Land Inequality	-0.17 (0.21)	<b>-0.371 **</b> (0.15)	-0.18 (0.13)	-0.015 (0.09)	-0.005 (0.16)	-0.07 (0.08)
Scheduled Tribes	-0.12 (0.17)	0.08 (0.08)	<b>-0.24 *</b> (0.13)	<b>-0.10 **</b> (0.05)	-0.03 (0.11)	<b>0.083 *</b> (0.05)
Scheduled Castes	0.34 (0.25)	0.03 (0.17)	<b>0.64 **</b> (0.19)	0.003 (0.09)	-0.05 (0.17)	0.081 (0.08)
Brahmans		0.971 (0.35)	0.576 (0.30)		0.188 (0.21)	
Muslims	-0.34 (0.60)	<b>-0.332 **</b> (0.14)	0.17 (0.29)	<b>-0.202 **</b> (0.07)	0.24 (0.32)	<b>0.167 **</b> (0.07)
Christians	-0.11 (0.43)	-0.14 (0.17)	0.024 (0.32)	-0.182 (0.15)	-0.28 (0.36)	<b>0.273 *</b> (0.15)
Sikhs	-1.15 (0.77)	0.155 (0.32)	0.15 (0.46)	-0.109 (0.38)	-0.067 (0.46)	0.092 (0.11)
Average Village Population	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	-0.003 (0.004)	-0.002 (0.00)	-0.002 (0.01)
Number of Villages	<b>-0.22 **</b> (0.06)	0.01 (0.02)	-0.01 (0.04)	0.01 (0.01)	-0.02 (0.04)	0.01 (0.01)
Political Fragmentation	<b>0.32 **</b> (0.13)	<b>0.322 **</b> (0.14)	0.10 (0.09)	0.089 (0.09)	0.05 (0.07)	<b>0.127 *</b> (0.07)
R-squared	0.47		0.75		0.76	

Notes: See Section 4 for a complete list of included variables. Huber-White robust standard errors in parentheses.

Table 3d: Power, Transport and Communication, 1971-1991.

Results from the estimation of (4) by OLS

Dependent Variable: the 1971-1991 change in the fraction of villages with the public good.

	Electricity 1991 change	Phone Connections 1991 change	Post Offices	Paved Roads
Social Fragmentation	<b>-0.63 **</b> (0.25)	<b>-0.294 **</b> (0.10)	0.11 (0.16)	<b>0.36 **</b> (0.18)
Land Inequality	-0.08 (0.15)	0.04 (0.11)	-0.16 (0.10)	<b>0.15 *</b> (0.09)
Scheduled Tribes	0.10 (0.11)	<b>-0.235 **</b> (0.05)	-0.001 (0.08)	<b>-0.25 **</b> (0.10)
Scheduled Castes	-0.15 (0.20)	-0.133 (0.13)	-0.07 (0.12)	-0.10 (0.07)
Brahmans		0.796 (0.25)	0.436 (0.16)	0.42 (0.14)
Muslims	<b>-0.58 *</b> (0.30)	<b>0.183 *</b> (0.09)	-0.04 (0.17)	<b>0.12 **</b> (0.06)
Christians	-0.379 (0.32)	-0.082 (0.11)	<b>-0.925 **</b> (0.36)	<b>0.16 *</b> (0.09)
Sikhs	-0.682 (0.55)	<b>-0.547 **</b> (0.22)	0.274 (0.27)	<b>0.549 **</b> (0.24)
Average Village Population	0.003 (0.003)	-0.004 (0.003)	-0.002 (0.003)	<b>0.01 **</b> (0.002)
Number of Villages	-0.01 (0.05)	<b>-0.054 **</b> (0.01)	<b>-0.15 **</b> (0.04)	0.01 (0.04)
Political Fragmentation	<b>-0.19 **</b> (0.09)	-0.111 (0.10)	0.002 (0.06)	-0.08 (0.07)
R-squared	0.81	0.67	0.57	0.80

Notes: See Section 4 for a complete list of included variables. Huber-White robust standard errors in parentheses.

**Table 3e: Convergence in Access to Public Goods, 1971-1991.**  
 Estimates on the 1971 level of each good from the estimation of (4) by OLS  
 Dependent Variable:  
 The 1971-1991 change in the fraction of villages with the public good.

Public good	coefficient on the 1971 level
Primary Schools	<b>-0.32 **</b> (0.04)
Middle Schools	<b>-0.20 **</b> (0.07)
High Schools	0.05 (0.15)
Health Centers	<b>-0.76 **</b> (0.06)
Dispensaries	<b>-0.56 **</b> (0.09)
Hospitals	<b>-0.69 **</b> (0.12)
Maternity and Child Welfare Centers	<b>-0.45 **</b> (0.19)
Family Planning Centers	<b>-0.68 **</b> (0.11)
Wells	<b>-0.23 **</b> (0.04)
Piped Water	<b>0.41 **</b> (0.13)
Tanks	<b>-0.31 **</b> (0.05)
Electricity	<b>-0.65 **</b> (0.05)
Phone Connections	-0.54 (0.38)
Post Offices	<b>-0.12 **</b> (0.06)
Paved Roads	<b>-0.31 **</b> (0.05)

Notes: \*\* and \* indicate statistical significance at the 5% and 10% levels respectively. Huber-White robust standard errors in parentheses.

Table 4: Specification Checks  
 Dependent Variable: The 1971-1991 change in the fraction of villages with each public good.

	eq. (4)		With agric. yields		IV using 1961 levels		Excl. pop density vars	
	STs	1971 level	STs	1971 level	STs	1971 level	STs	1971 level
Primary Schools	0.11 (0.08)	<b>-0.31 **</b> (0.04)	0.06 (0.09)	<b>-0.29 **</b> (0.04)	0.06 (0.08)	<b>-0.24 **</b> (0.08)	0.13 (0.09)	<b>-0.22 **</b> (0.03)
Middle Schools	<b>-0.21 **</b> (0.09)	<b>-0.20 **</b> (0.07)	<b>-0.22 **</b> (0.09)	<b>-0.27 **</b> (0.08)	-0.16 (0.12)	<b>-1.29 **</b> (0.35)	<b>-0.28 **</b> (0.10)	-0.03 (0.06)
High Schools	0.01 (0.04)	0.05 (0.15)	0.02 (0.04)	0.24 (0.17)	-0.09 (0.07)	<b>-1.44 **</b> (0.35)	-0.01 (0.04)	0.17 (0.11)
Health Centers	<b>0.03 **</b> (0.01)	<b>-0.76 **</b> (0.06)	<b>0.03 **</b> (0.01)	<b>-0.90 **</b> (0.06)	<b>0.03 **</b> (0.01)	<b>-0.90 **</b> (0.06)	<b>0.03 **</b> (0.01)	<b>-0.70 **</b> (0.05)
Dispensaries	-0.03 (0.03)	<b>-0.55 **</b> (0.09)	0.00 (0.03)	<b>-0.61 **</b> (0.08)	-0.09 (0.06)	<b>-1.08 **</b> (0.38)	-0.03 (0.03)	<b>-0.42 **</b> (0.09)
Hospitals	-0.02 (0.02)	<b>-0.69 **</b> (0.12)	-0.01 (0.01)	<b>-0.28 **</b> (0.06)	-0.07 (0.06)	1.17 (2.41)	<b>-0.04 *</b> (0.02)	<b>-0.23 **</b> (0.08)
Maternity and Child Centers	0.01 (0.02)	<b>-0.45 **</b> (0.19)	<b>0.04 **</b> (0.02)	<b>-0.46 **</b> (0.15)	-0.05 (0.04)	-0.41 (0.33)	0.01 (0.02)	<b>-0.38 **</b> (0.16)
Family planning Centers	<b>-0.09 **</b> (0.03)	<b>-0.68 **</b> (0.11)	<b>-0.05 *</b> (0.02)	<b>-0.36 **</b> (0.11)	<b>-0.05 **</b> (0.02)	<b>-0.36 **</b> (0.11)	<b>-0.09 **</b> (0.03)	<b>-0.73 **</b> (0.12)
Wells	-0.12 (0.17)	<b>-0.23 **</b> (0.04)	-0.20 (0.19)	<b>-0.24 **</b> (0.04)	-0.20 (0.19)	<b>-0.24 **</b> (0.04)	-0.04 (0.17)	<b>-0.21 **</b> (0.04)
Piped water	<b>-0.24 *</b> (0.13)	<b>0.41 **</b> (0.13)	<b>-0.32 **</b> (0.14)	<b>0.46 **</b> (0.14)	<b>-0.32 **</b> (0.14)	<b>0.46 **</b> (0.14)	-0.21 (0.13)	<b>0.39 **</b> (0.14)
Tanks	-0.03 (0.11)	<b>-0.31 **</b> (0.05)	-0.13 (0.12)	<b>-0.36 **</b> (0.05)	-0.13 (0.12)	<b>-0.36 **</b> (0.05)	-0.01 (0.11)	<b>-0.31 **</b> (0.05)
Electricity	0.10 (0.11)	<b>-0.65 **</b> (0.05)	0.17 (0.12)	<b>-0.66 **</b> (0.06)	0.17 (0.12)	<b>-0.66 **</b> (0.06)	0.01 (0.11)	<b>-0.60 **</b> (0.05)
Phone Connections	<b>-0.34 **</b> (0.11)	-0.54 (0.38)	<b>-0.22 **</b> (0.08)	0.54 (0.49)	<b>-0.22 **</b> (0.08)	0.54 (0.49)	<b>-0.36 **</b> (0.11)	0.07 (0.31)
Post-offices	0.00 (0.08)	<b>-0.12 **</b> (0.06)	-0.01 (0.09)	-0.02 (0.07)	0.05 (0.09)	0.03 (0.13)	0.02 (0.08)	-0.07 (0.06)
Paved Roads	<b>-0.25 **</b> (0.10)	<b>-0.31 **</b> (0.04)	<b>-0.21 **</b> (0.11)	<b>-0.39 **</b> (0.05)	<b>-0.21 **</b> (0.11)	<b>-0.39 **</b> (0.05)	<b>-0.36 **</b> (0.11)	<b>-0.17 **</b> (0.04)

Notes: The model with yields is based on 460 constituencies for which yield data is available. The IV regressions use between 355 and 493 observations depending on the public good in question. Also see notes below Table 3a.

Table 5: The two biggest influences on the availability of each public good in 1991.

Dependent Variable: The 1971-1991 change in the fraction of villages with the public good.

	largest effect	influence 1	second largest effect	influence 2
Primary Schools	-0.050	1971 level	0.015	Average Village Population
Middle Schools	-0.040	1971 level	-0.040	Christians
High Schools	-0.033	Social Fragmentation	0.032	Average Village Population
Health Centers	-0.015	1971 level	-0.005	Land Inequality
Dispensaries	-0.054	1971 level	0.025	Average Village Population
Hospitals	-0.035	1971 level	0.006	Land Inequality
Maternity and Child Welfare Centers	-0.028	1971 level		
Family Planning Centers	-0.044	1971 level	0.025	Christians
Wells	-0.067	1971 level	0.028	Political Fragmentation
Piped Water	0.097	1971 level	0.052	Scheduled Castes
Tanks	-0.064	1971 level		
Electricity	-0.159	1971 level	-0.069	Social fragmentation
Phone Connections	-0.069	Christians	-0.052	Scheduled Tribes
Post Offices	-0.053	Christians	-0.029	1971 level
Paved Roads	-0.078	1971 level	0.066	Sikhs

**Note:** The values of the largest and second largest effects have been calculated by multiplying the estimated coefficient for the 1991 by one standard deviation of the explanatory variable. Blank Cells indicate the absence of a second statistically significant coefficient.