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The Political Economy of Public goods: Some Evidence From India.

Abhijit Banerjee

Rohini Somanathan

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Indian Statistical Institute, Delhi
Planning Unit
7 S.J.S. Sansanwal Marg, New Delhi 110 016, India

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

Abhijit Banerjee† and Rohini Somanathan‡

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Abstract

This paper examines how public goods get allocated by a centralized state. We use data on social structure and public goods in rural India over the sixties, seventies and eighties to examine the influence of particular social groups, and of social and economic heterogeneity more generally, on the availability of public goods. This was a period of rapid expansion in these goods and of important shifts in the political leverage enjoyed by different groups. We find that social divisions are important, but so are the relative positions of particular groups in the broader social hierarchy. These divisions are not however immutable, nor is their influence overwhelming. Some previously marginalized communities have gained over this period while others continue to be disadvantaged. There has also been considerable convergence in the availability of public goods over this period, suggesting that the state feels some compulsion to equalize access, even to those who are not politically influential.

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†Department of Economics, MIT, banerjee@mit.edu

‡Department of Economics, University of Michigan and Indian Statistical Institute, rohinis@umich.edu

1 Introduction

At least since the work of Robert Bates (1981), political economists have emphasized the key role of ethnic divisions in the development process. In Bates' narrative, states became the captive of specific dominant groups and served them, at the cost of the economy as a whole.

A series of papers that started with the work of Alesina, Baqir and Easterly (1999) (see Alesina and La Ferrara (2000), Baland and Platteau (1998), Bardhan and Dayton-Johnson (2001), Dayton-Johnson (2000) and Miguel (1999)) take a more *ex ante* view of the same problem. These papers aruge that in ethnically or economically heterogenous populations there is greater potential for certain groups dominating others, à la Bates, because groups have more contact with each other. They then demonstrate that in the data, more heterogenous communities are associated with a reduced level of access to local public goods. Their interpretation of these results is that more heterogeneous communities get less because they are less able to work together to extract public goods from a recalcitrant state.[1]

Our paper shares with this later literature the premise that access to public goods is not necessarily automatic or rule-bound and that group heterogeneity may play an important role in determining public good allocations. On other hand, like Bates, we emphasize the importance of the existing differences in the power and influence of different groups, leading them to secure different levels of access to public goods. Also like Bates, we are interested in the fluidity of this power structure; the relative power of different groups can change dramatically over time, especially in countries experiencing economic and political transformation. Political power may get diffused as democratic institutions establish themselves, giving political voice to previously marginalized social groups and introducing greater political competition. Or traditional land-owning groups may lose ground to groups that dominate the emerging industrial class.

Finally we do not take as given that the demand side factors emphasized in this literature, namely the ability of groups to extract what they want from the state, are necessarily more important than the supply side factors: Electoral pressures, pressures from civil society and the judiciary, pressures from the outside world and the force of social norms, might compel

[1]Related to this, Easterly and Levine (1997) have argued that ethnic conflicts can explain a significant part of "Africa's Growth Tragedy"

the state to deliver public goods even to those who are in no position to extract them. The desegregation of the U.S. South was at least as much a result of such internal pressures as it was a consequence of unrest among the Blacks.[2]

We use parliamentary constituency-level data from rural India to examine these issues. Rural India is in many ways an ideal place to study the importance of social structure on public good provision: First, because the caste-based social hierarchy within rural Indian society, and social divisions more generally, are well-documented and easily identified in the data. Second, because there is enough variation in the social structure across these constituencies for us to be able to estimate these relationships based on the variation within each Indian state. The formal institutional structure within states is more or less uniform, and decisions on the location of most public goods are made by state governments. Finally, we consider a period of dramatic expansion in public goods. This allows us to identify the impact of our variables by using differences in availability over the period and avoids the bias associated with omitted variables if their values and influence are time-invariant.

The next section briefly describes the institutional structure through which public goods are provided in India and provides some historical background on policies relating to such provision. We then discuss our data sources (Section 3) and lay out the rationale for our empirical approach (Section 4). Section 5 first presents results on the relation between the level of public goods in the 1960s (based on the 1971 census) and various aspects of social structure in our current data set and then proceeds to examine influences on the growth of provision in the seventies and eighties.[3] Since we are primarily interested in the change in access to public goods between 1971 and 1991, we restrict ourselves to the public goods that are defined in a roughly consistent manner over the two decades. There are a total of 16 such goods spanning a range of categories: education, health, water and communication facilities.

[2]Khwaja (2002) makes an argument parallel to ours, suggesting that technical competence may have as big an impact on access to public goods as social heterogeneity.

[3]The results relating to the level of public goods in 1971 are based on a specification that is similar to the one used in our earlier work. Banerjee and Somanathan (2001), contains results on three parallel cross-sections based on census data from 1971, 1981 and 1991. The follow-up paper by Banerjee (2004) gets similar results after including additional controls for a specific set of historical factors. Both these papers use a district level data set while the present data set, though largely constructed from the same source, is at the parliamentary constituency level. This allows us to better understand political influences on the access to public goods.

Our results based on the 1971 data suggest that the standard measure of ethno-linguistic fragmentation applied to caste and religious divisions has a negative relation with access to public goods. This has been a common finding in most of the available literature on the effects of social heterogeneity using cross-section data. We find in addition, however several other important, and in some ways more systematic, influences on the availability of these goods. Constituencies with larger settlements are served better, consistent with the common view that it is easier to deliver public goods where the population is concentrated. Economic heterogeneity, measured by the Gini coefficient of landholdings, is positively associated with access to public goods. Our results also suggest that particular group identities have important effects: Areas with a concentration of Brahmans, the traditional priestly class considered the top of the caste hierarchy, have higher levels of schools and post offices but do not have systematically higher levels of other goods relative to the set of intermediate castes. Areas with groups that were recognized as socially and economically marginalized by the Indian state at the time of independence are associated with lower access. Of these, the Scheduled Tribes, who have traditionally been low in the Hindu social structure as to be outside the caste hierarchy, do worse that the Scheduled Castes that have been considered at the bottom of the Hindu caste hierarchy. Muslim areas do worse, while Christian areas do better, compared to areas with a high density of the majority Hindu religion. We do not find any systematic effects of commonly used measures of political competition such as the share of the winning party or the degree of political fragmentation in a constituency in the 1971 national elections (a measure of whether the vote is split across many parties).

These results, while suggestive, have some important shortcomings. To begin with, there is the problem of history—this evidence does not tell us whether the observed differences in public goods resulted mainly from decisions of the current Indian state or whether they are a legacy of colonial times, when the state clearly had very different priorities. The positive association between Christian concentrations and the existence of schools and hospitals, for example, might be attributed to the presence of missionaries in these areas over a long period of time, who helped establish many of the facilities that were later taken over by the state. Moreover, for many of the goods we consider, the bulk of the expansion in coverage took place after 1971. In the two decades between 1971 and 1991, primary schools increased by one-third, high schools doubled and the number of village with electricity went up three-fold. In 1971, only 3% of all villages had piped water; by 1991 coverage had increased to one-fifth of all villages. If we attempt to understand the determinants of public good provision using the data from 1991, we run into an obvious identification problem—is it the presence of a

high school that attracted Brahmans to this area or the other way around? Or is it some third factor—remoteness, for example, that accounts both for the lack of schools and the fact that the area still remains in the hands of the Scheduled Tribes.

In view of the above limitations, we focus on changes in availability of public goods between the two census years. We obtain our empirical specification in this case by differencing the model for the levels in 1991 and 1971, *without* imposing the constraint that the coefficients on our explanatory variables are the same in both years. As a result, explanatory variables in this specification include both levels and changes in our original set of variables. In addition, we include the level of the public good in 1971 to capture any convergence effects in public goods. This specification provides us with estimates of the coefficient on our explanatory variable in 1991 as well as estimates of the change in these coefficients over the 1971-1991 period. Estimating the differenced model helps with the problem of history, since we are using changes rather than levels of public goods as a dependent variable. It might also help with the identification for the usual reasons. On the other hand, given that social composition of villages changes slowly in rural India, this model is identified using relatively small changes, making it harder to find statistically significant results.

The growth results tell a very different story from the 1971 results in one important respect: The strongest influence, by far, on the growth of a public good is its initial level. For 13 out of the 15 public goods for which we have data, higher access in 1971, is associated with slower growth in the subsequent period, controlling for other constituency characteristics.[4] This would not be surprising if access to these goods was close to 100% at the start of the period, in fact it would be almost 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. For half of the goods in our data set, coverage was less than 5% of Indian villages in 1971 and less than 10% 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*[5] program, first put forward during her election campaign in 1971, the Indian state,

[4]We use a total of 16 public goods in this study, but one of these, primary health sub-centers, was introduced after 1971. We cannot therefore look at the effects of initial levels in this case- they were zero everywhere. We can however look at the factors influencing growth over the subsequent period.

[5]Translated as "remove poverty".

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.

In the differenced specification we find evidence of major shifts in the influence of different social structures. Scheduled Tribe areas and more fragmented areas do worse over time, while Scheduled Caste areas do better. In contrast with our results for 1971, economic inequality is associated with slower changes in access. We argue that these results reflect in part the fact that certain groups, such as the Scheduled Castes, are getting organized, but they are also the result of state initiatives to break down traditional social structures.

We conclude in section 5 with a discussion of what these results might mean.

2 Historical Background

The Indian constitution divides government functions and financial authority between the central and state governments. As in many federal systems, it is the states that are primarily responsible for health, education and various kinds of community development programs and state expenditures form about 80% of total government expenditures in these categories. The states receive large financial transfers from the center, to allow them to spend much more than they can tax. A significant part of these transfers are made to implement development programs that are outlined in the national five year plans. Local governments, until recently, have been created at the discretion of individual states and though many in number, they have very limited fiscal powers.[6]

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 direct contribution to the interests of the colonial power. The general neglect of the basic public goods continued through the early years of post-independence, which emphasized investments in heavy industry. As a result, in 1971, while 52 per cent of all Indian villages had primary schools, only 4% had high schools, 25% had paved roads,

[6] A constitutional ammendment in 1993 forced 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%.

18% had any electricity, 2% had tapped water and 6% percent had any medical facilities.

Official statements of the government's commitment to providing universal access to public goods started to proliferate in the late 1960s. The first explicit statement on universal primary education was the National Policy on Education of 1968, 21 years after independence. The Minimum Needs Program, launched during the fifth five year plan (1974-75), was the first time the state set down explicit norms about access to public goods in rural areas. The sixth five year plan (1980-85) makes clear the motivation for setting down 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. Even such outlays as were available were the first to get reduced in any conflict of priorities created by resource constraint. Further, the benefits of social services cannot reach the poorest without conscious efforts to that end...The Minimum Needs programme lays down the urgency for providing social services according to nationally accepted norms, within a time bound programme... The programme introduced in the Fifth Plan will continue during the Sixth Plan. 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...".[7] The norms included a primary school and safe water within a mile of every village, paved roads to villages with populations over 1000 and electricity to at least 40% of villages in every state. A multi-tiered health system was introduced with Health Centers for large settlements, Primary Health Centers for villages with populations over 30,000 and Primary Health Sub-Centers for villages of 5,000. Some of these norms were relaxed over the subsequent period while others became more stringent, depending on what was considered feasible, but there was, by and large, continuity in the policies relating to public good provision. In addition to the above programs, special initiatives were introduced to ensure that these facilities reached marginalized communities. Most plans restate 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".[8]

The early 1970s thus saw a number of key adjustments in the attitude of the Indian state towards the delivery of public goods: it clearly became much more explicit about its responsibilities and made very specific statements on delivering on these responsibilities. Not

[7]Planning Commission, Sixth Five Year Plan, Chapter 14.

[8]Sixth Five Year Plan, Chapter 26.

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.[9]

Consistent with political and policy statements, the two decades after 1971 saw a very substantial expansion of public facilities. As can be seen from Table 1a, the fraction of villages with primary schools went up by about a third, high schools doubled, villages with electricity almost quadrupled, the fraction with phone connections went up by a factor of five and those with piped water increased nearly eight-fold. Clearly the state felt a compulsions to deliver on its new commitments.

What is less clear is to what extent these compulsions were internal compulsions, driven by the imperatives of the bureaucracy that was assigned the task of implementing the programs that had been announced to the public, and to what extent it was a result of pressures from specific constituencies. A part of the problem is that it is not clear how pressures from outside get exerted: Locally provided goods are not locally financed and decisions about where to build a school or a road are taken at the state level or even at the central level. While the process by which these governments allocate the public goods is not transparent and probably quite complex, it is plausible that the ability of communities to collectively articulate their demands to politicians and administrators is important in determining their location. Such articulation may involve informing politicians that the provision of these goods is important for their reelection, visits to district administrators who implement development plans or it may mean local contributions of land or labor which allow the building of schools and health facilities.[10] All of this is presumably easier for those groups that are good at working together; social fragmentation is therefore likely to matter. On the other hand being politically well-

[9]Today this is entirely the norm: the 1998 elections to the Madhya Pradesh state government were won by the incumbent party partly based 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 on the part of the electorate with basic infrastructural facilities

[10]The south Indian village studied by Epstein et al.(1998), had many facilities that were unusual for a village of its size-they obtained piped water as a result of meetings between the village council and the district administration, a high school was sanctioned after one of village families provided a building, and a health Center was constructed after the villagers donated land for it.

connected or having the ability to articulate demands effectively ought to help; everything else being same, areas with a high density of brahmans or other elite groups will do better than scheduled tribe dominated areas. Having a landed elite might also help for this reason, though it might also hurt because economic inequality can undermine collective action.

The goal of this paper is to come up with a quantitative assessment of the importance of these and other social and political factors in determining the allocation of public goods, both in absolute terms and relative to the extent to which there is a "natural" tendency towards convergence, reflecting perhaps the influence of the explicit commitments made by the state.

3 Data

We have pooled secondary data from a wide variety of official sources in order to control, as carefully as possible, for the various influences on the availability of public goods. Most of these data are originally available at the district-level. We first discuss the original data sources and then describe the procedure we used to map these data into parliamentary constituencies. Electoral data is of course generated at the constituency level.

3.1 Public goods

Data on the availability of different public goods is compiled by the Decennial Census of India. This is known as village directory data and is available at the village level in the District Census Handbook for each district in each census year. These data are obtained from records kept with the block offices and are not directly collected by the Census of India. The public good categories listed in these data were standardized in 1971. In 1971 and 1991, the data have been aggregated at the district level to generate the fraction of villages in the district that have a particular public good. Data for the other years (1961 and 1981) are available only in the District Census Handbooks. [11] We make some use of the 1961 data

[11] 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 but these were also subsequently published under Office of the Registrar General, India (1997).

but are severely limited in the extent we can do so, because each state publishes figures on different sets of goods, and we could only match a few of these across the states.

We started with the entire set of public goods for which data is available in both censuses.[12] To this list we added Primary Health Sub-Centers, which were the health facilities that were introduced in the 1970s. As noted above, their introduction was accompanied by a re positioning of the Primary Health Centers (PHCs) and perhaps the rest of the infrastructure as well. [13] This raises the possibility that the health facilities listed in our data may not be strictly comparable over the years.

The village directory data do not reveal whether or not a facility was funded and operated by the state; only the total number of facilities are listed, irrespective of ownership and management. In some cases, this is unambiguous since the categories were either created by the state or provision was exclusively by the state. This is true for the different types of health centers, piped water, electricity, post offices, phone connections and paved roads. Private schools until the nineties were largely in urban India, and so it is likely that we are measuring mainly state provision. In the case of dispensaries, hospitals, wells and tanks, we are less sure. Hospitals tend to be state-owned and operated. There were a large number of state-owned dispensaries,[14] but there may also have been others. It is also possible that some wells and tanks were constructed by particular groups within the village for their own use and in these cases there is unlikely to have been open access to other villagers. We present results for all listed categories, leaving it to the reader to interpret them with the above caveats in mind.

Table 1a lists the fraction of Indian villages with different types of infrastructural facilities in 1971 and 1991 together with the standard deviation in availability across parliamentary constituencies. Table 1b lists state-wise figures for selected public goods. The data certainly shows abundant evidence that access to public investments is not uniform. In 1971 only 20%

[12]There are a total of 17 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 that 1% of Indian villages had a college. Post and telegraph offices are not listed in the 1991. Post offices are listed in both years and we do use this as one of our goods. The category is excluded because of classification differences between the two years. In 1991 tubewells and handpumps are listed separately and there is no combined category. Since our data is aggregated at the district level, we could not generate the combined figure.

[13]Nayyar(1991) discusses some of these changes in classification of rural health facilities, pages 92-102.

[14]Figures for these can be found in the national Five Year Plans and in Nayyar (1991)

of the villages in Himachal Pradesh had primary schools but 81% of villages in Maharashtra and 95% of those in Kerala did. The variation within states in 1971 was almost as stark. Uttar Pradesh, often cited as one of the more backward states of the country, had large areas with no electricity in 1971 and others will over half of all villages covered. In Andhra Pradesh, a state with relatively high levels of provison in 1971, constituencies in the north-eastern tip had about one-third the coverage of those further down the same coastline. The expansion was also very different in different places. It is certainly true 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 about 15% of their villages with electricity in 1971, with Gujarat slightly behind Bihar. By 1991, almost every village in the Gujarat had electricity, while the figure for Bihar had only risen to 40%. Phone connections spread from 4% to 28% of villages in Gujarat while they remained under 2% in Bihar. In addition to state-level differences in overall performance, there were clearly differences in priorities. Less than 1% of villages in both Punjab and Madhya Pradesh had piped water in 1971; this facility spread to over a quarter of all Punjab villages by 1991 but to less than 3% of villages in Madhya Pradesh. In contrast, the availability post offices in Punjab stayed almost unchanged, whereas the number in Madhya Pradesh almost doubled. These variations underline 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 has been intensely studied by anthropologists and the Indian caste system has functioned as the primary lens through which village life has been observed. Hindus (the major religious group) are divided into a number of castes, with strict and long-standing rules which govern their interaction. Marriages rarely take place across caste boundaries and the sharing of food and other social interaction 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.[15] Within villages, castes often inhabit different hamlets and the distinction be-

[15] "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 are significant differences between social mobility in the caste system and social mobility in the class system.

tween 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 traditionally formed the bottom. There are also groups that typically so marginal that they are excluded from the entire Hindu caste system; these are now included in the list of Scheduled Tribes in Indian Constitution. Society is also divided along religious lines, with Muslims, Christians, Jains and Sikhs being the major minority religions.

Census data on the population fractions of Scheduled Castes and Tribes as well the different religions is available for all census years in Independent India. Scheduled Tribes tend to be more localized than scheduled castes. There 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 that 1%. [16] The coefficient of variation across parliamentary constituencies is 187% for Scheduled Tribes and 53% for Scheduled Castes.

The last enumeration of caste is from the 1931 census.[17] These data are available by districts, separately for each of the British Indian provinces and princely states. While state boundaries were redrawn after independence, district boundaries in the former region of British India remained relatively undisturbed, except for the princely states which were taken over by the state after political independence. Between 1971 and 1991, a number of new districts were created, mainly by sub-dividing old ones. For all new districts created after 1931, we weight the caste figures from the original district according to the area of the new district which was taken from them.

The number of castes listed in the 1931 is very large and we restrict ourselves to Hindu castes which form more than 1% of the population of each state or province in 1931. Putting data for different states together, we have a total of 185 caste groups. We make one major adjustment to this data to account for the increase in the proportion of Hindus after 1931. Some districts had significant Muslim populations which emigrated to the newly created nation of Pakistan around the time of Indian independence in 1947. We scale up the numbers in each caste group, based on the population share of Hindus in the current census. This assumes that

In the latter it is the individual who moves up or down, whereas in the former entire communities change their position" Beteille, p. 190.

[16] This figure would be somewhat higher if we included the sparsely populated north-eastern states.

[17] Some caste data was collected by the 1941 census but it was never tabulated- a combined effect of the war combined with the volatile political situation in India.

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 data on group wise variations in fertility and migration rates that would allow us to be able to do much more.

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

$$h = 1 - \sum_{1}^{n} s_i^2 \tag{1}$$

where s_i refers to the population share of the ith group. We assume that each Hindu caste is a separate group, but that all the other religious groups are internally homogenous. This is clearly an extreme assumption. There are caste divisions among Muslims and Sikhs—but they not religiously sanctioned and appear to be less politically salient. 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 a 7-fold classification of religion. There are 5 sizable religious minorities: Muslims, Christians, Sikhs, Buddhists and Jains. All other religions are in a separate category, as are those who do not state their religion. In constructing our measure we use shares of each of these 7 categories in addition to shares in each of our caste categories. For religions the shares are contemporaneous and for castes, they are based on the 1931 data in the manner described above. Our data confirm the idea that Indian society is extremely fragmented. In terms of magnitudes, our measure of heterogeneity (the standard ethnic fractionalization index) has a mean of .9 in 1971, compared to the mean value of .26 for US cities that Alesina, Baqir and Easterly report. It ranges from 0.2 to nearly 1.

In this context of sharp divides between different groups, many of the effects of heterogeneity alluded to in the last section may be present. There is anecdotal evidence, mainly from village studies, that different castes often use different water sources and, because of norms that limit the entry of lower castes into upper caste neighborhoods, the location of schools and other public places within villages influences their use. Changes in village leadership have often been accompanied by a change in the location of the public building where village meetings are held.[18] Political parties often pledge allegiance to particular caste groups and their

[18]Beteille (1969) in his classic study of a village in south India describes the way in which temples, meeting rooms and the elementary school are strategically located to make access easy for particular castes. He also finds that social cleavages are heightened as villages participate in political activity. "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

interests and in fact many have argued increased rural involvement in politics has sharpened social caste and communal divides.[19] Fukunaga(1993), in his study of village factions in Uttar Pradesh, describes how development projects introduced in the 1970s created large potential rents for those who administered them in the village. This led to increased political activity which was almost always along group lines. The lower castes, who had shown little interest in earlier elections were now mobilized by those seeking political office.

In estimating the growth equation we will rely on changes in the fragmentation index. Since all our caste data are historical, changes in this variable are driven mainly by changes in the fraction of different religions. These changes do show some variability across constituencies, but are typically very small. This needs to be kept in mind when interpreting the coefficients on social fragmentation from equation 6.

3.3 Land distribution

Gini coefficients have been tabulated from data on the number of operated landholdings. These data are from the Agricultural Census of India which is held every 5 years. Published data are not systematically available. Most states publish *State Statistical Abstracts* which contain selected data from the past agricultural census. In a few cases, we were not able to find published data corresponding to both 1971 and 1991 and use data from the closest year for which they are available. We include agricultural labor and assign it zero holdings. We also have to make some other adjustments because the reports contain only the total number of holdings within a certain size category and these categories are not always the same for all the states. The Gini coefficient of the land distribution so generated goes from 0.33 to an impressively high 0.89 in 1971. There is very little overall change in this measure of land inequality between the two census years.[20]

Data on operational holdings is clearly a less than perfect substitute for what we really

structure are brought to the surface" (p. 179)

[19] "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, p150). Also see Singh (1993).

[20] The change in land inequality which we observe over the period may be understated because of missing data for 1971. All the 16 states which we consider have published land data for 1991, but only 7 of them have it for 1971, and for these states we simply use figures from subsequent years.

want, which is the data on ownership holdings. Fragmented holdings and tenancy both create a wedge between these two measures. Our only defense is that tenancy has declined enormously in India since independence and most land is now owner cultivated, sometimes based on hired labor.

3.4 Geography and demographics

The decennial census contains the average village population and the number of villages in each district.

We use several variables to control for geography. These, by construction, do not vary over time in our data set and are meant to capture geographical terrain and other roughly fixed characteristics which may influence the need for different types of public goods and the ease with which they can be provided. The 1991 Census lists minimum and maximum temperatures for all urban agglomerations. For each district, we use temperature figures for the administrative capital. Our Figures for *normal annual rainfall* by district are from the Indian Meteorological Department and are based on average rainfall over the period 1940-1990. We use 3 variables that capture the geographical characteristics of land that is neither cultivated nor under forest; the district's area which is barren or rocky, that which is largely sandy and mountainous areas. These are from the Wasteland Atlas of India for the year 2000. They are published by the Ministry of Rural Development and are based on satellite data put together by the National Remote Sensing Agency in India.

In addition, we use a dummy for constituencies which are on the coast.

3.5 Political Variables

Party shares and turnouts are available for parliamentary constituencies from the Election Commission of India. For elections in 1971 and 1991, these data have been tabulated by Butler, Lahiri and Roy in their book *India Decides*(1991). For each constituency, this book lists the shares of the five biggest parties, and clubs the rest together in a sixth category (others). In contrast to district boundaries, there have been relatively few changes in constituency boundaries since 1971. There were 518 constituencies in 1971, this number went

up to 542 after the Delimitation order of 1976 and then to 543 in 1991. For newly created constituencies, the book lists the vote shares from the constituencies from which the new constituency was created, so we are always dealing with figures for the 543 constituencies for all election years. Of these 543, 517 are in 16 largest states (with more than 95% of the country's population). These are what we work with. We therefore leave out Kashmir, which is politically very different from the rest of India and which did not have a census in 1991 due to political unrest. We also leave out the Northeastern states (with the exception of Assam), which are ethnically quite distinct. Some regions of the country, were governed directly by the government at the Center during the period of this study. We also ignore these.

There were general elections in 1971 and 1991. We use electoral data for these years to compute two measures of political competition. The first is the share of total votes received by the winning party in each constituency. The second is a measure of political fragmentation, very similar in its construction to our social fragmentation measure described above and used widely in the literature on comparative politics (Rae, 1971). We use the vote shares of the five biggest parties in each constituency and combine all other votes into a sixth category. Our measure is then

$$p = 1 - \sum_{1}^{n} v_i^2 \tag{2}$$

where v_i refers to the vote share of the ith party.

The average vote share of the winning party in 1971 was 55% and the mean political fragmentation was .56. Consistent with commentaries on changes in Indian politics over the next two decades, we find a rise in political fragmentation and a fall in the average vote share of the winning party. The rise in political fragmentation occurred in all states with the exception of West Bengal and Kerela, which have traditionally been controlled by the political Left.

3.6 Mapping District Data into Parliamentary Constituencies

We used two different procedures for creating constituency level data from district data. For variables like rainfall and average village population, where averages rather than numbers were available at the district level, we generated a weighted average using the share of each constituency that came from various districts. For public goods, religion, caste, Scheduled Castes and tribes, the number of villages, and other variables where the total *numbers* were available for each district, we generated the total number per constituency by attaching weights to districts based on the share of the district that went to each constituency. These weights were based on the fraction of the area of each district that goes into a constituency. There are two main sources of errors that may creep in. First, we did not have accurate areas for constituencies and therefore 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 after a few iterations, during which we tried to bring the number of villages in the constituency in 1971 and the number in 1991 as close as possible.

4 Empirical Strategy

4.1 The specifications

The relationship in levels we are interested in estimating takes the form

$$y_{ijkt} = f_{it}(\mathbf{p}_{jkt}, \mathbf{e}_{jkt}, \mathbf{x}_{jkt}, \mathbf{s}_k, \varepsilon_{ijkt}) \tag{3}$$

where y_{ijkt} is the share of villages with the ith public good in the jth constituency in the kth state in census year t, p_{jkt} is a set of population characteristics of the constituency in year t (share of Scheduled Castes and tribes, share of brahmans, Muslims, Christians, Sikhs, caste and religious fragmentation, Gini coefficient of land-holdings, average population of a village (in thousands), the number of villages in a constituency (in thousands)), e_{jkt} is a set of election outcomes in year t, $\mathbf{x}_{jt}$ is a vector of geographical characteristics (rainfall, minimum and maximum temperature, the fraction under the 3 types of wasteland and a

dummy for constituencies which have a coastline), s_k is a dummy for the state, and ε_{ijkt} is a constituency and good specific shock.

Since $y_{ijt}$is a share, a natural structure for estimating this relationship would be to use a logit model. However the variables we are interested in are usually reasonably far from the limits, so we opt for a linear probability model, which is convenient in several ways: First because 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 logit model does not have. However as a specification check we will also estimate these relationships based on a logit model.

Under the linear probability model assumption

$$y_{ijkt} = \alpha_{it}\mathbf{p}_{jkt} + \beta_{it}\mathbf{e}_{jkt} + \gamma_{it}\mathbf{x}_{jkt} + \sigma_{it}\mathbf{s}_k + \varepsilon_{ijkt} \tag{4}$$

We begin by estimating this relationship by ordinary least squares in the 1971 cross-section: this is exactly what the literature does. Our base specification includes the full range of geographical controls, the shares of brahmans, Scheduled Castes and Tribes, Muslims, Christians, Sikhs, the caste and religious fragmentation measure, the Gini coefficient, the size of the average village in the constituency and the number of villages in the average constituency. We always include state dummies, to control for systematic differences across states. This is necessary because states may have different definitions of what they call middle schools or hospitals. Also most public goods investment decisions are by the state government and therefore the competition for public goods takes place at the state level. We estimate additional specifications that include measures of electoral competition—the political fragmentation measure, the share of the winning party—in the 1971 elections.

If we assume that this kind of relationship holds in both 1971 and 1991, we can difference them to get the growth equation:

$$\begin{aligned} y_{ijkt+1} - y_{ijkt} = \Delta y_{ijkt} = (\alpha_{it+1} - \alpha_{it})\mathbf{p}_{jkt} + \alpha_{it+1}\Delta\mathbf{p}_{jkt} + (\beta_{it+1} - \beta_{it})\mathbf{e}_{jkt} + \beta_{it+1}\Delta\mathbf{e}_{jkt} \\ + (\gamma_{it+1} - \gamma_{it})\mathbf{x}_{jkt} + (\sigma_{it+1} - \sigma_{it})\mathbf{s}_k + \varepsilon_{ijkt+1} - \varepsilon_{ijkt} \end{aligned} \tag{5}$$

under the presumption that the geographical variables do not change over time. However we do not have values of $\Delta\mathbf{p}_{jkt}$ for all the variables in $\mathbf{p}$. In particular, this is true for the

share of Brahmans which is based entirely on data from 1931. In our base specification we estimate this equation by omitting $\Delta \mathbf{p}_{jkt}$ for this variable. In addition, our base specification for the growth equation includes y_{ijk71} as a control, in order to examine the possibility of convergence. Given that our dependent variable is typically increasing over time and bounded, convergence is almost unavoidable.[21] The basic equation we estimate is therefore

$$\begin{aligned} y_{ijk91} - y_{ijk71} = &\Delta y_{ijk71} = \xi_{ijk} y_{ijk71} + \widehat{\alpha}_i \mathbf{p}_{jk71} + \overline{\alpha}_i \Delta \mathbf{p}_{jk71} + \widehat{\beta}_i \mathbf{e}_{jk71} + \overline{\beta}_i \Delta \mathbf{e}_{jk71} \\ &+ \widehat{\gamma}_i \mathbf{x}_{jk71} + \widehat{\sigma}_i \mathbf{s}_k + \widehat{\varepsilon}_{ijk71} \end{aligned} \tag{6}$$

4.2 Identification issues

Since we do not have a quasi-experiment here, the interpretation of our results will depend on how far we succeed in controlling for omitted sources of variation. In all our specifications we control for a range of geographical variables, including rainfall, the maximum and minimum temperature, whether it lies on the coast, whether the area is classified as barren/rocky or sandy and finally whether the terrain is described as steep-sloping. We also control for population density—by including the average population of a village in the constituency. The size of the constituency is also controlled for, by including the number of villages in a constituency. However we are concerned with the endogeneity of both these variables, and therefore check the robustness of our results by excluding them.

We are also concerned about the possibility that the inclusion of a lagged dependent variable on the right-hand-side can be a source of bias; in order to make sure that this is not too much of an issue we instrument the 1971 value, y_{ijkt} by its lagged value, wherever we have the relevant data and check that the results are unchanged. Finally since this is data from rural India and agricultural productivity is mainstay of the rural economy we estimate a specification where we include the average agricultural yield in the constituency over the 1956-61 period. While there is an obvious danger of productivity being caused by the public goods outcomes, the fact that the yield numbers are from the period before the expansion of public goods helps.

In addition our model nests the model where there is a district fixed effect, but we do not

[21] In effect we are assuming that the 1971 level enters the 1991 level equation without a corresponding term in the 1971 level equation -we are limited by the data we have.

impose the restriction that the coefficients are constant over time. Given that this evolution is happening in an environment where the 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 the coefficients would remain unchanged.

It is obviously not clear that all the unobserved variation can be captured by a constituency fixed effect (plus the noise term): after all shifts in the population distribution of a specific community or caste could easily reflect *changes* in the political climate of the district, which also affects access to public goods. Indeed we feel that endogeneity may be a more serious problem for the changes than for the levels; this is because, excepting in the partition years, population movements in rural India have been slow . The variation in the levels therefore reflect mainly the long-term influences on India's population, which need not have much to do with the ability to claim public goods (especially when we use the 1931 shares). The changes after 1971, on the other hand, might very well be in response to changes in the access to public goods. Finally, while the Indian census figures are generally reliable, it is likely that the changes are more influenced by measurement error than the levels. Therefore while there are good reasons to worry about unobserved constituency characteristics, it is not entirely clear that the growth results are obviously more reliable than the results from the level equations. However as we will see, they paint a relatively consistent picture: we will therefore focus mainly on the growth results.

Turning to the variables of interest, the caste variables that go into the construction of the caste and religious fragmentation are from the 1931 census and are therefore less likely to be picking up the influences of other, more contemporary, forces in the area. Unfortunately we cannot really do this for the other demographic variables: the shares of the different religions have changed enormously after partition, while the categories of Scheduled Castes and Scheduled Tribes were defined after partition.[22]

We are also directly interested in how the presence of specific castes and religious groups affects access to public goods (over and above the influence of heterogeneity). In addition we need to include the shares of different groups to ensure that the fragmentation measure is picking up heterogeneity and not the presence of specific groups.

[22]In principle, we could get the list of Scheduled Castes and Tribes from each state and use it to construct the shares of these groups in 1931, but we have not been able to get the data to do this.

Our base specification also includes controls for electoral outcomes in the constituency, though we also estimate a specification where the electoral variables are dropped, on the grounds that these outcome are likely to be more endogenous than the demographic structures.

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.[23] The reason is that neither of these vary over time.

4.3 The problem of substitution

Even if we correctly estimate the effect of the right-hand side variables, it is not always clear what we should make of the results. The problem is that while we expect certain types of districts to have less public goods in general there is no guarantee that they will get less of every public good. In fact they may be given more of some public goods precisely because they have less of others. This may be, for example, a part of some political mechanism aimed at making sure that they do not become too unhappy. Or it could be a part of an attempt to deal with the consequences of the lack of other public goods. For example, a village that has no hospital is probably more likely to get a health center.

This kind of substitution is obviously 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, actually found evidence of substitution: In their data (which is from the US) ethnic diversity 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.[24]

It is however probably less of a problem for our exercise because unlike Alesina et al., who

[23]The land tenure variable was first emphasized by Banerjee and Iyer (2003), while the non-British variable is from Iyer (2003).

[24]The fact other studies do not find similar evidence of substitution might reflect the fact that they only look at a subset of public goods, and it is not implausible, given that they can only look at some public goods, that they would focus on the ones where they have reason to believe that they will find what they are looking for.

focus on how the share of spending on different public goods varies across different cities, we are interested in the share of villages in a constituency that have a particular public good. The shares clearly have add up to implying that there has to be some substitution across goods, whereas, given that most villages had few of the listed health facilities in 1971, and access to all of them was being expanded, it is quite plausible that a favored constituency would gain along all the health dimensions over the next twenty years. Indeed as we will note later, densely populated areas have more of almost all public goods and significantly less of none of them.

Another way to deal with this problem, suggested in Banerjee and Somanathan (2001), is to use the fact that the Scheduled Tribes in India tend to be the single weakest political group of any size and therefore are unlikely to have much access to the most desirable public goods. If we accept that less access to public goods should be interpreted as less access to the most desired public goods defined thus, 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 tables, are very similar to the results for the entire group for which we have data—we therefore reports results for the full set of goods.

4.4 Hypotheses

With the caveat in the previous sub-section, our main hypotheses are the following: First, areas with a higher than average presence of Scheduled Tribes and Scheduled Castes, historically the two weakest social groups in India, will do worse than average in terms of access to public goods; this effect should be strongest for the Scheduled Tribes because they tend to be concentrated in certain districts, while the Scheduled Castes tend to be dispersed and therefore can benefit from the presence of other, better-connected, groups.

Second, areas with a higher than average presence of Brahmans, the traditional elite caste, should have better access to public goods than the average area and areas dominated by Muslims, the main politically identified minority group, should have worse. However the authority of the Brahmans has been challenged by the rise of the middle castes over the course of the 20th century (the Dravidian movement in Tamil Nadu, being the most famous example of this challenge) and it is often alleged that Muslims often wield influence disproportionate to their numbers by virtue of voting as a block. Therefore both these effects may be fairly

weak.

Third, areas with a high degree of caste and religious fragmentation should have worse access to public goods.

Fourth, areas with a high level of political competition, as measured by our measure of political fragmentation should have better access to public goods.

Fifth, areas where the population density is high, as measured by the population of the average village, ought to have more public goods, if only because our measure, which just looks for whether a village has at least one of a particular good, directly favors larger villages.

In addition, we will be interested in whether more or less unequal districts (as measured by the Gini coefficient of landholdings) get more access to public goods. Here, as the literature has emphasized,[25] there are two competing effects: High inequality might help accessing public goods, because the poor can benefit from the efforts of the rich on their own behalf (assuming that the rich are more effective in getting public goods). High inequality might also hurt, much as caste heterogeneity might, because there is more conflict between the stake-holders.

Finally, in the growth regressions we will be interested in the extent to which there is convergence or divergence: i.e. do poorly endowed districts catch up with the better endowed districts.

In the 1971 level regressions, our hypotheses predict the signs of the level of the variable coefficient, while in the change regressions the immediate implication is about the coefficient on the *changes* in the variables of interest. We have no clear predictions about the coefficient on the *levels* of these variables in the change regressions ($\widehat{\alpha}$ and $\widehat{\beta}$) in equation 6, since it would require us to have a prior about whether some were becoming more important over time, or less important.

[25] See Bardhan and Dayton-Johnson (2000).

5 Results

5.1 1971 results

The results from estimating equation 4 are reported in Tables 2a-d. Of these Table 2a reports on the three education public goods, while Table 2b reports on the 5 health variables, Table 2c reports on the 3 water variables and Table 2d reports on the 4 communication and transport variables. For brevity, we discuss only those coefficients here which are statistically significant at the 10% level or higher. Details on the others are in the tables.

The results are remarkably consistent with our hypotheses above: among the fifteen goods for which we have 1971 data, the share of Scheduled Tribes is negative in ten cases. For Scheduled Castes, it is negative for eight goods and positive for two. The share of Muslims is negative for seven goods and that of Christians is positive for the same seven. The share of Brahmans is positive for six goods and negative for three.

Caste and religious fragmentation is negative in six cases and positive in two. Of the political variables, the size of the constituency is negative in eight cases and positive in two. The political fragmentation variable is however positive and negative in equal numbers of cases (two each).

These results, are largely what we would have expected, excepting in the case of the Brahmans, where the evidence seems to suggest that their influence was perhaps more limited than we might have expected. We also see that Gini Coefficient is positive in eight of the 15 cases and never negative. In other words, areas that were more unequal in 1971 had better access to public goods.

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. Also, the norms that were set out in the Five Year Plans were often in terms of ensuring provision to villages of a certain size.

Geography matters relatively little except for rainfall which has a positive effect, areas under sands, which is also positive and being coastal which, somewhat surprisingly, has a negative

effect.

5.2 Growth results

Results from estimating the growth equation 6 are reported in Tables 3a-3e: the division of the goods exactly parallels that in Table 2, with the one difference that we know have data for 6 health goods (the additional one being Primary Health Sub-centers which were not listed in 1971).[26]

Our results in Table 3e show strong evidence for convergence. The 1971 level of the good is negative and significant in 12 of the 15 goods and positive in one.

The coefficient on the differences, $\overline{\alpha}_i$ and $\overline{\beta}_i$ in equation 6, are supposed to provide us with estimates of α_{i91} and β_{i91} in **??**, while the coefficient on the 1971 levels in the growth equation ($\widehat{\alpha}$ and $\widehat{\beta}$ in 6) is supposed to tell us the difference between the 1971 coefficient and the 1991 coefficients. In Table 3a-3d we report, for the variables of interest, the coefficients on the 1991 variables estimated from the growth equation, the change in the coefficient between 1971 and 1991 estimated by the growth equation, and for comparison, the 1971 coefficients estimated from equation 4 (reported in the previous sub-section).

We first note that while the 1971 and 1991 results are broadly similar, there are important differences between them. The 1991 coefficients tell us, consistent with the 1971 results, that districts with Scheduled Tribe concentrations tend to do worse than average. Also consistent with the 1971 results is the fact that population density is associated with higher access . Political fragmentation in 1991, as in 1971, does not seem to affect the provision of most goods.

In contrast with the 1971 results, neither socio-religious fragmentation nor a Muslim presence makes a systematic difference in either direction. Finally the share of Scheduled Castes whenever statistically signigicant is positive, while in the 1971 level regressions it was systematically negative. The same pattern is repeated with the Gini Coefficient growth variable, which is negative in five cases and positive in two, whereas the 1971 level coefficient was

[26]The institution of a Sub-center was introduced in the 1970s; for this reason there is no convergence term in the Sub-center equation.

emphatically positive.

One possible interpretation of these numbers is that the true coefficients actually changed signs between 1971 and 1991. This is something we can check, because as noted above, we have estimates of the change in the coefficient. We therefore ask whether, in all cases where the 1991 coefficient was significantly different from zero, if the direction of change in the coefficient could explain the difference between the estimated 1971 and 1991 coefficients. As we can see from Tables 3a-3d, this works rather well: in every single case in which the Scheduled Tribe coefficient was more negative in 1991 than 1971, the predicted direction of change is indeed negative; of the four goods for which the Scheduled Caste coefficient is significant in 1991, the predicted direction of change is wrong in only one; and so on, for the other coefficients. There is no sharp inconsistency between the two sets of results.

What is clear however is that the 1991 results that we get from the growth regression are less likely to be significant than the 1971 results that we get from the 1971 level equations. This might reflect the fact that the 1991 results are identified from changes, which are sometimes quite small. It might also reflect the fact that the 1971 results are biased because the independent variables are correlated with district fixed effects. Finally it could reflect the fact that changes are less well measured.

Given that the two sets of results are broadly consistent, in the rest of the paper we will focus on the 1991 results that we get from the equation (6). These results suggest that the one significant section of Indian society that seems unambiguously disadvantaged in terms of their political clout 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, as well as the biggest minority group, the Muslims, who seem to be doing no worse than the rest.

The fact that the Scheduled Tribe areas do so much worse than the rest while the Scheduled Castes do better, is consistent with the fact, observed above, that Scheduled Tribes tend to be concentrated geographically, whereas the Scheduled Castes are much less so. It is possible that this hurts them because the areas where they live also tend to be remote, but given that we have detailed geographical controls (which, by the way, do not seem to matter very much for access to public goods), this is unlikely to be the main reason. It is more plausible that the gap between Scheduled Tribes and the Scheduled Castes, reflects the fact that the

Scheduled Castes live in areas where other, more powerful groups are also located, whereas the Scheduled Tribes tend to be isolated. However this too cannot be the entire story since Scheduled areas actually do better than the average constituency over the 1971-91 period. One possibility is that at least by 1991, the Scheduled Castes had actually become quite good at articulating their demands within the Indian political framework, which would be consistent with the fact that in 1990s a Scheduled Caste party (BS) came to rule India's most populous state. Alternatively, the main impetus might have come from above: This was also a period when the Indian state was making a conscious attempt to deal with historical inequities, as reflected by the attempt to implement the Mandal Commission report by the V.P. Singh Government in 1990 and The Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989. Moreover there is evidence that these kinds of targeted interventions were quite effective: Pande (2003) shows that the policies reserving seats in the legislatures for Scheduled Castes has had a significant impact on transfers to Scheduled Castes.

The only other robust influence on access to public goods among variables that we have looked at here, is land inequality. The coefficient on this variable, is typically negative in the growth equations, suggesting that more unequal villages find it harder to act together.

The fact that the political fragmentation variable has no effect is also notable, especially given the fact the political divisions often mirror caste and religious divisions and these kinds of social divisions do seem to matter. However it is worth pointing out that to the extent that variation in political fragmentation reflects variation in social fragmentation we might expect its effect to be negative, while to the extent that it reflects exogenous variation in the extent of political competition, we would expect it to have a positive effect. On balance it is not clear which way the net effect should go (we do control for social fragmentation but there is obviously no guarantee that we have controlled for the right measure of fragmentation). Political fragmentation may also mean that the government is sustained by coalition of parties and is therefore unstable and weak. In this case fragmentation will be undesirable, because it goes with ineffective governments, instead of reflecting a competitive political environment and therefore being desirable.

Finally, we note that in a number of cases the change in the coefficients between 1971 and 1991 is significant: The strongest results are that the Scheduled Tribe coefficient and (less clearly) the socio-religious fragmentation coefficient has tended to become more negative, while the Brahman coefficient and the population density variables have become more posi-

tive. There is thus no reason to think that social structure is about to become irrelevant.

5.3 Robustness

Table 4 reports results from a number of attempts to check the robustness of the conclusions drawn in the previous sub-section. The first two columns of the table report the results of our basic specification for the two variables for which we get the most striking results—the share of Scheduled Tribes and the 1971 level of access to that public good, measured, as usual, by the size of an average village.

The next two columns report coefficients for when we include a control for the average agricultural yield in the constituency. This was constructed using district level data from the India Agriculture and Climate Data Set assembled by the World Bank. Since we are using rural data, yield, one might expect, is one of the most important determinants of the economic power of the area, which is potentially an 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 growth in public goods that is our independent variable. The yield itself comes in negative, which tells us that the influence of yield became less positive (or more negative) over the 1971-1991 period, which is consistent with the view that there is a lot of convergence.

The results, for both the outcomes are very similar to those in columns 1 and 2. The point estimates have the same sign and are similar in magnitude.

In the next two columns we investigate what happens when we instrument for the 1971 level of the public good in equation (6) by the corresponding level in 1961, to deal with the usual problem of correlation between the lagged dependent variable and the error term. The results are in columns 5 and 6 for the 9 goods for which we have 1961 data. We clearly lose some precision by doing this, but the estimated coefficients for the 1971 level variable (which measures convergence) in column 6 usually have the same sign as the ones in column 2, and are about equally likely to be larger and smaller (and are statistically indistinguishable), suggesting that there is no systematic bias. For the Scheduled Tribe variable, 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 regression where we drop both the population density and the number of villages in a district. Our qualitative results are mostly intact. The Scheduled Tribes coefficient is negative in six 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. The opposite is true for the same one good, tapped water, as in the original specification.

We performed a number of other specification checks, not reported here. One is to replace the political fragmentation variable with a variable that measures the share of the vote that went to the winning party or a variable that measure the gap between the vote share of the winning party and the share of the second biggest party. None of these work any better than the fragmentation variable. Finally we try a specification where we drop the political fragmentation variable, on the grounds that it might be endogenous. The other results remain almost entirely unaffected.

5.4 Magnitude of the Impact

Table 5 reports, for each public good, the three exogenous variables that have the largest impact on access to that good, where impact is measured by $\overline{\alpha}_i$ (or $\overline{\beta}_i$) in equation (6) multiplied by one standard deviation of variable i (in 1991 levels). We see that a constituency that has one standard deviation more of (say) villages that had the good in 1971 may have 16 percentage points less growth in villages with electricity. The impact is enormous, as might be expected given that the convergence coefficient is almost two-thirds. For 11 of the 15 goods, the biggest impact is that of convergence, and its impact is often many times that of the next most important influence.

Other variables that have a large impact are the share of Scheduled Tribes (almost always negative), share of Sikhs and Christians (no clear sign pattern), population density (always positive) and caste and religious fragmentation (usually negative). Overall, the results suggest that while social and demographic factors continue to have a big effect, the most important factor in the majority of the cases is convergence.

6 Conclusion

Our results suggest that while social divisions are indeed important, they do not have to 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 much progress towards equalizing access, as evidenced by the broad convergence and the high growth in Scheduled Caste areas.

The Scheduled Tribes, who seem to be diverging from the rest of society over the period we study, are the one exception to this pattern. 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.

This may however be too optimistic a view of the evidence: the problem is that the convergence has taken place in outcomes that are relatively easy to deliver: Schools are easy to build. Getting good teachers to them 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.

The 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 growth regression, suggests results that are closely aligned with our public good results: Scheduled Tribe areas are falling behind in literacy as well (so are the Muslims, who are however not falling behind in access to public goods), while Scheduled Castes, are, if anything, improving their literacy faster than the rest. However 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 therefore 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, it 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 Fraction of Indian Villages with Different Types of Public Goods, 1971-1991.		
	1971	1991
Primary Schools	0.53	0.73
	(0.20)	(0.16)
Middle Schools	0.08	0.19
	(0.17)	(0.20)
High Schools	0.04	0.08
	(0.13)	(0.16)
Health Centers	0.01	0.01
	(0.04)	(0.02)
Dispensaries	0.03	0.03
	(0.15)	(0.10)
Hospitals	0.01	0.02
	(0.06)	(0.05)
Maternity and Child Welfare Centers	0.01	0.02
	(0.05)	(0.06)
Family Planning Centers	0.01	0.02
	(0.10)	(0.07)
Piped Water	0.02	0.18
	(0.07)	(0.24)
Water Tanks	0.13	0.14
	(0.17)	(0.21)
Wells	0.78	0.70
	(0.22)	(0.29)
Electricity	0.18	0.70
	(0.26)	(0.25)
Post Offices	0.15	0.22
	(0.18)	(0.24)
Phone Collections	0.01	0.06
	(0.07)	(0.16)
Paved Roads	0.25	0.37
	(0.19)	(0.25)
Primary Health Sub-centers		0.07
		(0.10)
Number of Villages	551640	565092
	(788)	(794)
Notes: The fractions of each good are taken directly from the Census of India. The figures in parentheses are standard deviations over parliamentary constituencies. The last row refers to the number of villages in our data in each year.		

Table 1b: Access to Seclected Public Goods by State, 1971.							
State	**Primary Schools**	**High Schools**	**Hospitals**	**Piped Water**	**Electricity**	**Phone Connections**	**Paved Roads**
Andhra Pradesh	0.70	0.07	0.01	0.01	0.25	0.01	0.28
	(0.16)	(0.04)	(0.005)	(0.02)	(0.14)	(0.02)	(0.13)
Assam	0.61	0.02	0.05	0.02	0.03	0.01	0.20
	(0.06)	(0.01)	(0.03)	(0.01)	(0.02)	(0.01)	(0.05)
Bihar	0.48	0.03	0.00005	0.0003	0.15	0.01	0.24
	(0.11)	(0.02)	(0.0001)	(0.0002)	(0.13)	(0.01)	(0.05)
Gujarat	0.85	0.07	0.01	0.12	0.13	0.04	0.28
	(0.09)	(0.06)	(0.01)	(0.11)	(0.09)	(0.06)	(0.10)
Haryana	0.65	0.09	0.03	0.05	1.00	0.03	0.56
	(0.09)	(0.04)	(0.01)	(0.04)	(0.003)	(0.01)	(0.09)
Himachal Pradesh	0.20	0.02	0.01	0.15	0.22	0.003	0.15
	(0.10)	(0.01)	(0.002)	(0.11)	(0.03)	(0.003)	(0.02)
Karnataka	0.63	0.04	0.00	0.01	0.40	0.03	0.41
	(0.09)	(0.03)	(0.003)	(0.01)	(0.15)	(0.04)	(0.10)
Kerela	0.95	0.56	0.20	0.20	0.87	0.31	0.99
	(0.05)	(0.17)	(0.14)	(0.08)	(0.12)	(0.13)	(0.01)
Maharashtra	0.81	0.09	0.00	0.02	0.34	0.01	0.24
	(0.12)	(0.05)	(0.002)	(0.03)	(0.10)	(0.01)	(0.07)
Madhya Pradesh	0.44	0.01	0.01	0.004	0.04	0.002	0.20
	(0.08)	(0.004)	(0.004)	(0.01)	(0.03)	(0.01)	(0.07)
Orissa	0.52	0.03	0.00	0.01	0.03	0.01	0.18
	(0.09)	(0.02)	(0.002)	(0.004)	(0.02)	(0.003)	(0.07)
Punjab	0.57	0.05	0.01	0.003	0.49	0.01	0.41
	(0.11)	(0.02)	(0.003)	(0.01)	(0.15)	(0.004)	(0.04)
Rajasthan	0.48	0.02	0.02	0.01	0.08	0.02	0.17
	(0.12)	(0.01)	(0.01)	(0.01)	(0.04)	(0.01)	(0.05)
Tamil Nadu	0.77	0.09	0.02	0.09	0.66	0.02	0.54
	(0.06)	(0.10)	(0.04)	(0.07)	(0.16)	(0.05)	(0.14)
Uttar Pradesh	0.39	0.01	0.01	0.03	0.19	0.002	(0.251)
	(0.14)	(0.01)	(0.01)	(0.05)	(0.14)	(0.003)	(0.07)
West Bengal	0.60	0.06	0.01	0.01	0.03	0.01	0.25
	(0.13)	(0.03)	(0.03)	(0.03)	(0.06)	(0.02)	(0.09)
Notes: The fractions of each good are taken from the Census of India. The figures in parentheses are standard deviations over parliamentary constituencies in each state.							

Table 2a: Determinants of Public Good Availability in 1971: Education			
Results from the estimation of equation (4) by OLS (robust Huber-White standard errors in parentheses).			
Dependent Variable: Fraction of villages with the public good in 1991 - fraction of villages with the public good in 1971			
	Primary Schools	**Middle Schools**	**High Schools**
Social Fragmentation	**-0.24****	0.05	**-0.07****
	(0.08)	(0.07)	(0.03)
Land Inequality	**0.18****	**0.14****	0.02
	(0.07)	(0.03)	(0.02)
Scheduled Tribes	-0.02	**-0.08****	**-0.05****
	(0.03)	(0.02)	(0.01)
Scheduled Castes	0.10	**-0.19****	**-0.04****
	(0.08)	(0.05)	(0.02)
Brahmans	**0.49****	**0.15***	**0.10***
	(0.18)	(0.09)	(0.03)
Muslims	-0.10	0.01	**-0.06****
	(0.07)	(0.03)	(0.02)
Christians	-0.06	-0.11	**0.29****
	(0.11)	(0.09)	(0.06)
Sikhs	0.04	0.05	**-0.08****
	(0.18)	(0.08)	(0.04)
Average Village Population	**0.02****	**0.03****	**0.03****
	(0.004)	(0.004)	(0.002)
Number of Villages	**-0.10****	**-0.02****	**-0.004****
	(0.01)	(0.004)	(0.002)
Political Fragmentation	0.03	**0.05***	**-0.02***
	(0.06)	(0.02)	(0.01)
Sands	**0.23****	0.06	-0.02
	(0.10)	(0.04)	(0.02)
Rainfall	-0.00004	0.00003	-0.0000005
	(0.00001)	(0.00002)	(0.00004)
Coastal	-0.03	0.01	**-0.01****
	(0.02)	(0.01)	(0.01)
Maxtemp	**-0.003***	0.0004	**0.001****
	(0.001)	(0.001)	(0.0003)
Mintemp	0.002	0.0002	**0.001****
	(0.001)	(0.001)	(0.0004)
Additional explanatory variables: State dummies, fraction of area barren/ rocky, fraction of area mountainous.			
* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.			

Table 2b: Determinants of Public Good Availability in 1971: Health

Results from the estimation of equation (4) by OLS (robust Huber-White standard errors in parentheses).

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

	Health Centers	Dispensaries	Hospitals	Maternity/Child Centers	Family Planning Centers
Social Fragmentation	**-0.03***	-0.01	-0.03	**0.07****	**-0.05****
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Land Inequality	-0.02	-0.01	-0.01	-0.03	**0.03***
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)
Scheduled Tribes	-0.0003	**-0.05****	-0.004	-0.0005	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Scheduled Castes	**-0.02***	**-0.05****	**0.06****	**-0.02***	0.01
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Brahmans	**0.03***	0.03	**-0.07****	-0.03	0.03
	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
Muslims	0.01	**-0.04****	**-0.08****	-0.001	-0.01
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Christians	0.04	**0.19****	**0.17****	-0.05	-0.02
	(0.05)	(0.05)	(0.05)	(0.07)	(0.09)
Sikhs	-0.02	-0.03	**-0.05****	**0.05***	**-0.06****
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Average Village Population	**0.01****	**0.02****	**0.02****	**0.02****	**0.01****
	(0.004)	(0.002)	(0.002)	(0.003)	(0.005)
Number of Villages	**-0.003****	**-0.004****	**0.003****	**0.003****	-0.001
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Political Fragmentation	-0.002	**-0.03****	0.01	0.004	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Sands	0.002	-0.04	0.03	-0.02	0.01
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)
Rainfall	0.000003	0.000005	0.000006	0.000004	0.000006
	(0.000002)	(0.000003)	(0.000004)	(0.000002)	(0.000004)
Coastal	0.003	**0.01****	**-0.01***	0.003	-0.01
	(0.004)	(0.004)	(0.003)	(0.01)	(0.01)
Maxtemp	-0.0002	-0.0001	0.0003	-0.00004	0.0001
	(0.0002)	(0.0003)	(0.0002)	(0.0002)	(0.0003)
Mintemp	-0.0002	0.0001	**-0.0005****	0.0003	-0.0003
	(0.0002)	(0.0004)	(0.0003)	(0.0003)	(0.0002)

Additional explanatory variables: State dummies, fraction of area barren/ rocky, fraction of area mountainous.

* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 2c: Determinants of Public Good Availability in 1971: Water			
Results from the estimation of equation (4) by OLS (robust Huber-White standard errors in parentheses).			
Dependent Variable: Fraction of villages with the public good in 1991 - fraction of villages with the public good in 1971			
	Wells	**Piped Water**	**Tanks**
Social Fragmentation	**0.32***	**-0.14****	**-0.18***
	(0.19)	(0.07)	(0.11)
Land Inequality	0.06	**0.08****	-0.04
	(0.10)	(0.03)	(0.10)
Scheduled Tribes	**-0.15****	**-0.04***	**-0.14***
	(0.06)	(0.02)	(0.06)
Scheduled Castes	0.01	**-0.08****	**-0.16***
	(0.16)	(0.03)	(0.09)
Brahmans	**-0.89****	**0.11***	-0.40
	(0.38)	(0.07)	(0.29)
Muslims	0.12	**-0.11****	**-0.29****
	(0.13)	(0.03)	(0.11)
Christians	0.11	**0.24****	**0.25***
	(0.13)	(0.05)	(0.12)
Sikhs	**-1.11****	-0.08	-0.16
	(0.47)	(0.08)	(0.19)
Average Village Population	-0.0003	**0.006****	0.003
	(0.003)	(0.002)	(0.05)
Number of Villages	-0.01	-0.002	-0.01
	(0.18)	(0.05)	(0.01)
Political Fragmentation	**0.31****	-0.02	0.03
	(0.09)	(0.02)	(0.06)
Sands	0.02	**0.08****	**1****
	(0.33)	(0.03)	(0.26)
Rainfall	0.00001	0.00002	0.00001
	(0.00002)	(0.000005)	(0.00002)
Coastal	**-0.06****	**-0.02****	0.03
	(0.03)	(0.01)	(0.02)
Maxtemp	0.004	-0.001	0.002
	(0.003)	(0.001)	(0.001)
Mintemp	-0.003	-0.001	0.001
	(0.003)	(0.001)	(0.002)
Additional explanatory variables: State dummies, fraction of area barren/rocky, and fraction of area mountainous.			
* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.			

Table 2d: Determinants of Public Good Availability in 1971: Power and Communications

Results from the estimation of equation (4) by OLS (robust Huber-White standard errors in parentheses).

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

	Electricity	Phone Connections	Post Offices	Paved Roads
Social Fragmentation	-0.13	-0.03	0.03	-0.02
	(0.11)	(0.02)	(0.09)	(0.08)
Land Inequality	**0.29****	**0.05****	**0.27****	**0.28****
	(0.09)	(0.02)	(0.06)	(0.07)
Scheduled Tribes	**-0.14****	**-0.05****	**-0.14****	**-0.07****
	(0.04)	(0.01)	(0.03)	(0.03)
Scheduled Castes	**0.17****	-0.004	**-0.24****	-0.05
	(0.09)	(0.02)	(0.07)	(0.07)
Brahmans	**-0.57****	-0.02	**0.27****	0.07
	(0.20)	(0.03)	(0.13)	(0.15)
Muslims	**-0.19****	**-0.06****	0.04	-0.003
	(0.07)	(0.02)	(0.05)	(0.05)
Christians	**0.31****	**0.30****	-0.04	-0.05
	(0.16)	(0.05)	(0.17)	(0.13)
Sikhs	-0.14	-0.02	0.08	-0.07
	(0.23)	(0.03)	(0.15)	(0.16)
Average Village Population	**0.14****	**0.17****	**0.24****	**0.21****
	(0.01)	(0.00)	(0.01)	(0.01)
Number of Villages	**-0.37***	-0.02	**-0.05***	**-0.04***
	(0.08)	(0.01)	(0.01)	(0.01)
Political Fragmentation	-0.06	0.002	0.02	-0.05
	(0.06)	(0.01)	(0.05)	(0.04)
Sands	0.11	**0.04****	**0.23****	**0.12***
	(0.11)	(0.02)	(0.06)	(0.07)
Rainfall	0.000001	0.00002	0.000008	0.00002
	(0.00001)	(0.000005)	(0.00002)	(0.00001)
Coastal	0.01	**-0.01****	-0.0003	-0.01
	(0.02)	(0.01)	(0.02)	(0.01)
Maxtemp	-0.002	0.0001	**-0.002****	-0.002
	(0.002)	(0.0003)	(0.001)	(0.001)
Mintemp	-0.002	-0.0004	-0.0002	-0.001
	(0.001)	(0.0003)	(0.001)	(0.001)

Additional explanatory variables: State dummies, fraction of area barren / rocky, and fraction of area mountainous.

* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 3a:Determinants of Public Goods Provision, 1971-1991: Education

Results from the estimation equations (4) & (6) by OLS (robust Huber-White standard errors in parenthesis)

For each public good, the dependent variable in the first two columns is based on equation 6 and the dependent variable in the third column is based on equation 4.

	Primary Schools			Middle Schools			High Schools		
	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971
Social Fragmentation	-0.15	0.01	**-0.24****	**-0.35****	**-0.21****	0.05	**-0.30****	-0.06	**-0.07****
	(0.12)	(0.06)	(0.08)	(0.16)	(0.06)	(0.07)	(0.09)	(0.04)	(0.03)
Land Inequality	0.09	0.004	**0.18****	**-0.17****	-0.03	**0.14****	-0.06	0.02	0.02
	(0.07)	(0.04)	(0.07)	(0.06)	(0.04)	(0.03)	(0.04)	(0.02)	(0.02)
Scheduled Tribes	0.11	**0.07****	-0.02	**-0.21****	-0.04	**-0.08****	0.01	-0.02	**-0.05****
	(0.08)	(0.03)	(0.03)	(0.09)	(0.03)	(0.02)	(0.04)	(0.02)	(0.01)
Scheduled Castes	-0.02	-0.03	0.10	-0.12	0.01	**-0.19****	**0.16****	**-0.06****	**-0.04****
	(0.11)	(0.06)	(0.08)	(0.12)	(0.07)	(0.05)	(0.08)	(0.03)	(0.02)
Brahmans		0.15	**0.49****		**0.19****	**0.15***		-0.02	**0.1***
		(0.12)	(0.18)		(0.08)	(0.09)		(0.06)	(0.03)
Muslims	0.14	0.01	-0.10	-0.09	**-0.13****	0.01	**-0.23****	-0.03	**-0.06****
	(0.17)	(0.04)	(0.07)	(0.17)	(0.05)	(0.03)	(0.09)	(0.03)	(0.02)
Christians	0.11	-0.003	-0.06	**-0.70****	0.01	-0.11	-0.12	**-0.29****	**0.29****
	(0.22)	(0.07)	(0.11)	(0.33)	(0.09)	(0.09)	(0.30)	(0.10)	(0.06)
Sikhs	0.04	-0.23**	0.04	0.24	-0.12	0.05	-0.06	-0.07	**-0.08****
	(0.13)	(0.09)	(0.18)	(0.32)	(0.13)	(0.08)	(0.19)	(0.08)	(0.04)
Average Village Population	**0.01****	**-0.003****	**0.02****	**0.01****	**0.01****	**0.03****	**0.01***	0.01	**0.03****
	(0.01)	(0.002)	(0.004)	(0.04)	(0.004)	(0.004)	(0.05)	(0.01)	(0.002)
Number of Villages	**-0.18***	**-0.04****	**-0.10****	-0.03	**-0.03****	**-0.02****	-0.004	**-0.01****	**-0.004****
	(0.31)	(0.01)	(0.01)	(0.25)	(0.01)	(0.00)	(0.11)	(0.003)	(0.002)
Political Fragmentation	0.05	0.01	0.03	**-0.12****	-0.08	**0.05***	0.01	**0.04***	**-0.02***
	(0.04)	(0.05)	(0.06)	(0.04)	(0.05)	(0.02)	(0.02)	(0.02)	(0.01)

Notes: Additional explanatory variables: State dummies, rainfall, dummy for constituencies with a coastline, minimum temperature, maximum temperature, fraction of area under sands, fraction of area barren or rocky, fraction mountainous, and level of the public good in 1971 for the 1971 level are in table 3e.

* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 3b (i): Determinants of Public Goods Provision, 1971-1991: Health

Results from the estimation equations (4) & (6) by OLS (robust Huber-White standard errors in parenthesis)

For each public good, the dependent variable in the first two columns is based on equation 6 and the dependent variable in the third column is based on equation 4.

	Health Centers			**Dispensaries**			**Hospitals**			**Primary Health Sub Centres**		
	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971
Social Fragmentation	-0.01	**-0.02****	**-0.03***	0.03	**-0.06***	-0.01	0.03	**-0.04***	-0.03	-0.03	-0.06	
	(0.02)	(0.01)	(0.02)	(0.06)	(0.04)	(0.02)	(0.04)	(0.02)	(0.02)	(0.12)	(0.06)	
Land Inequality	**-0.05***	-0.01	-0.02	**-0.12****	**-0.05****	-0.01	**0.05***	-0.03	-0.01	**-0.12****	-0.02	
	(0.03)	(0.01)	(0.01)	(0.04)	(0.02)	(0.02)	(0.03)	(0.02)	(0.01)	(0.06)	(0.05)	
Scheduled Tribes	**0.03****	**-0.01***	-0.0003	-0.03	0.01	**-0.05****	-0.02	0.003	-0.004	**-0.10***	0.02	
	(0.01)	(0.004)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.06)	(0.02)	
Scheduled Castes	**0.04***	0.01	**-0.02***	**0.12****	0.02	**-0.05****	0.02	**0.04****	**0.06****	-0.004	**0.09****	
	(0.02)	(0.01)	(0.01)	(0.05)	(0.02)	(0.02)	(0.03)	(0.01)	(0.02)	(0.07)	(0.04)	
Brahmans		**-0.06***	**0.03***		-0.004	0.03		0.01	**-0.07****		-0.05	Not
		(0.04)	(0.02)		(0.03)	(0.03)		(0.02)	(0.03)		(0.09)	applicable
Muslims	-0.02	**-0.02****	0.01	-0.05	0.03	**-0.04****	0.04	**-0.04****	**-0.08****	-0.14	-0.02	since there
	(0.03)	(0.01)	(0.01)	(0.07)	(0.02)	(0.02)	(0.04)	(0.01)	(0.02)	(0.14)	(0.04)	were no
Christians	0.06	**0.05****	0.04	-0.2	-0.08	**0.19****	0.07	0.02	**0.17****	-0.18	**-0.30****	"Primary
	(0.07)	(0.02)	(0.05)	(0.20)	(0.08)	(0.05)	(0.13)	(0.07)	(0.05)	(0.20)	(0.10)	Health
Sikhs	0.01	-0.01	-0.02	0.05	0.01	-0.03	0.002	0.05	**-0.05****	0.08	-0.18	Sub-
	(0.04)	(0.02)	(0.02)	(0.09)	(0.07)	(0.03)	(0.07)	(0.03)	(0.02)	(0.24)	(0.11)	centres" in
Average Village Population	0.0001	0.002	**0.01****	**0.01***	**0.01***	**0.02****	0.0002	**0.02****	**0.02****	**0.01****	**0.01****	1971
	(0.004)	(0.001)	(0.04)	(0.04)	(0.004)	(0.02)	(0.01)	(0.003)	(0.02)	(0.00)	(0.00)	
Number of Villages	-0.004	-0.001	**-0.003****	-0.01	-0.003	**-0.004****	**-0.02****	0.001	**0.003****	-0.001	**-0.01****	
	(0.05)	(0.001)	(0.01)	(0.09)	(0.002)	(0.02)	(0.06)	(0.001)	(0.01)	(0.00)	(0.00)	
Political Fragmentation	0.01	0.01	-0.002	-0.01	0.01	**-0.03****	-0.01	-0.01	0.01	-0.05	**-0.08***	
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.04)	

Notes: Additional explanatory variables: State dummies, rainfall, dummy for constituencies with a coastline, minimum temperature, maximum temperature, fraction of area under sands, fraction of area barren or rocky, fraction mountainous, and level of the public good in 1971 for the 1971 level are in table 3e.

* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 3b (ii): Determinants of Public Goods Provision, 1971-1991: Health

Results from the estimation equations (4) & (6) by OLS (robust Huber-White standard errors in parenthesis)

For each public good, the dependent variable in the first two columns is based on equation 6 and the dependent variable in the third column is based on equation 4.

	Maternity/Child Centers			**Family Planning Centers**		
	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971
Social fragmentation	-0.04	0.01	**0.07****	-0.01	-0.01	**-0.05****
	(0.05)	(0.02)	(0.02)	(0.06)	(0.02)	(0.02)
Land inequality	-0.002	0.03	-0.03	0.01	**0.07****	**0.03***
	(0.04)	(0.02)	(0.02)	(0.04)	(0.03)	(0.02)
Scheduled tribes	0.01	0.01	-0.0005	**-0.09****	**-0.04****	-0.01
	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Scheduled castes	0.02	-0.02	**-0.02***	-0.02	**-0.05****	0.01
	(0.04)	(0.03)	(0.01)	(0.04)	(0.02)	(0.01)
Brahmans		0.06	-0.03		0.05	0.03
		(0.07)	(0.02)		(0.06)	(0.02)
Muslims	-0.04	0.04	-0.001	-0.02	-0.02	-0.01
	(0.07)	(0.02)	(0.01)	(0.06)	(0.02)	(0.01)
Christians	0.24	0.10	-0.05	**0.43****	**0.19****	-0.02
	(0.17)	(0.08)	(0.07)	(0.17)	(0.06)	(0.09)
Sikhs	-0.03	0.01	**0.05***	0.01	0.01	**-0.06****
	(0.06)	(0.04)	(0.03)	(0.06)	(0.04)	(0.02)
Average village population	0.003	0.002	**0.02****	0.01	-0.004	**0.01****
	(0.02)	(0.004)	(0.03)	(0.02)	(0.003)	(0.05)
Number of villages	-0.04	-0.003	**0.003****	-0.13	**-0.01****	-0.001
	(0.07)	(0.002)	(0.01)	(0.08)	(0.002)	(0.02)
Political Fragmentation	-0.02	-0.03	0.004	-0.01	0.01	-0.01
	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)	(0.01)

Notes: Additional explanatory variables: State dummies, rainfall, dummy for constituencies with a coastline, minimum temperature, maximum temperature, fraction of area under sands, fraction of area barren or rocky, fraction mountainous, and level of the public good in 1971 for the 1971 level are in table 3e.

* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 3c :Determinants of Public Goods Provision, 1971-1991: Water

Results from the estimation equations (4) & (6) by OLS (robust Huber-White standard errors in parenthesis)

For each public good, the dependent variable in the first two columns is based on equation 6 and the dependent variable in the third column is based on equation 4.

	Wells			**Piped Water**			**Tanks**		
	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971
Social Fragmentation	-0.45	**0.41****	**0.32***	-0.02	**-0.33****	**-0.14****	0.10	0.02	**-0.18***
	(0.38)	(0.16)	(0.19)	(0.33)	(0.13)	(0.07)	(0.30)	(0.07)	(0.11)
Land Inequality	-0.17	**-0.37****	0.06	-0.18	-0.01	**0.08****	-0.005	-0.07	-0.04
	(0.21)	(0.15)	(0.10)	(0.13)	(0.09)	(0.03)	(0.16)	(0.08)	(0.10)
Scheduled Tribes	-0.12	0.08	**-0.15****	-0.24	**-0.10****	**-0.04***	-0.03	**0.08***	**-0.14***
	(0.17)	(0.08)	(0.06)	(0.13)	(0.04)	(0.02)	(0.11)	(0.04)	(0.06)
Scheduled Castes	0.34	0.03	0.01	**0.64****	0.003	**-0.08****	-0.05	0.08	**-0.16***
	(0.25)	(0.17)	(0.16)	(0.19)	(0.09)	(0.03)	(0.17)	(0.08)	(0.09)
Brahmans		**0.97****	**-0.89****		**0.58***	**0.11***		0.19	-0.40
		(0.35)	(0.38)		(0.30)	(0.07)		(0.21)	(0.29)
Muslims	-0.33	**-0.33****	0.12	0.17	**-0.20****	**-0.11****	0.24	**0.17****	**-0.29****
	(0.60)	(0.14)	(0.13)	(0.29)	(0.07)	(0.03)	(0.32)	(0.07)	(0.11)
Christians	-0.11	-0.14	0.11	0.02	-0.18	**0.24****	-0.28	0.27	**0.25***
	(0.43)	(0.17)	(0.13)	(0.32)	(0.15)	(0.05)	(0.36)	(0.15)	(0.12)
Sikhs	-1.15	0.15	**-1.11****	0.14	-0.11	-0.08	-0.07	0.09	-0.16
	(0.77)	(0.32)	(0.47)	(0.46)	(0.38)	(0.08)	(0.46)	(0.11)	(0.19)
Average Village Population	0.01	0.01	-0.0003	0.01	-0.003	**0.006****	-0.002	-0.002	0.003
	(0.06)	(0.01)	(0.03)	(0.06)	(0.004)	(0.02)	(0.03)	(0.01)	(0.05)
Number of villages	**-0.22****	0.01	-0.01	-0.09	0.01	-0.002	-0.16	0.01	-0.01
	(0.58)	(0.02)	(0.18)	(0.41)	(0.01)	(0.05)	(0.35)	(0.01)	(0.11)
Political Fragmentation	**0.32****	**0.32****	**0.31****	0.10	0.09	-0.02	0.05	**0.13***	0.03
	(0.13)	(0.14)	(0.09)	(0.09)	(0.09)	(0.02)	(0.07)	(0.07)	(0.06)

Notes: Additional explanatory variables: State dummies, rainfall, dummy for constituencies with a coastline, minimum temperature, maximum temperature, fraction of area under sands, fraction of area barren or rocky, fraction mountainous, and level of the public good in 1971 for the 1971 level are in table 3e.

* and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 3d: Determinants of Public Goods Provision, 1971-1991: Power & Communication

Results from the estimation equations (4) & (6) by OLS (robust Huber-White standard errors in parenthesis)

For each public good, the dependent variable in the first two columns is based on equation 6 and the dependent variable in the third column is based on equation 4.

	Electricity			**Phone connections**			**Post Offices**			**Paved Roads**		
	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971	Coefficient in 1991	Coefficient change	Coefficient in 1971
Social Fragmentation	**-0.63****	**-0.29****	-0.13	**0.41***	**0.22****	-0.03	0.11	**-0.24****	0.03	**0.36****	0.02	-0.02
	(0.25)	(0.10)	(0.11)	(0.22)	(0.10)	(0.02)	(0.16)	(0.08)	(0.09)	(0.18)	(0.07)	(0.08)
Land Inequality	-0.08	0.04	**0.29****	-0.09	0.09	**0.05****	-0.16	**0.13***	**0.27****	**0.15***	**0.26****	**0.28****
	(0.15)	(0.11)	(0.09)	(0.10)	(0.06)	(0.02)	(0.09)	(0.08)	(0.06)	(0.09)	(0.06)	(0.07)
Scheduled Tribes	0.10	**-0.24****	**-0.14****	**-0.34****	**-0.10****	**-0.05****	-0.001	0.08	**-0.14****	**-0.25****	-0.05	**-0.07****
	(0.11)	(0.05)	(0.04)	(0.11)	(0.04)	(0.01)	(0.08)	(0.06)	(0.03)	(0.10)	(0.03)	(0.03)
Scheduled Castes	-0.15	-0.13	**0.17****	0.02	**-0.12***	-0.004	-0.07	0.09	**-0.24****	-0.10	-0.11	-0.05
	(0.20)	(0.13)	(0.09)	(0.12)	(0.06)	(0.02)	(0.12)	(0.06)	(0.07)	(0.12)	(0.07)	(0.07)
Brahmans		**0.80****	**-0.57****		**-0.23****	**-0.02**		**0.44****	**0.27****		**0.42****	0.07
		(0.25)	(0.20)		(0.11)	(0.03)		(0.16)	(0.13)		(0.14)	(0.15)
Muslims	-0.58*	**0.18***	**-0.19****	0.09	-0.02	**-0.06****	-0.04	-0.07	0.04	0.28	**0.12****	-0.003
	(0.30)	(0.09)	(0.07)	(0.18)	(0.05)	(0.02)	(0.17)	(0.05)	(0.05)	(0.23)	(0.05)	(0.05)
Christians	-0.38	-0.08	**0.31****	**-1.20****	-0.26	**0.30****	**-0.93****	-0.10	-0.04	-0.42	**0.16***	-0.05
	(0.32)	(0.11)	(0.16)	(0.59)	(0.22)	(0.05)	(0.36)	(0.13)	(0.17)	(0.31)	(0.09)	(0.13)
Sikhs	-0.68	**-0.55****	-0.14	**0.41***	**0.29****	-0.02	0.27	-0.29	0.08	**0.55****	0.13	-0.07
	(0.55)	(0.22)	(0.23)	(0.21)	(0.13)	(0.03)	(0.27)	(0.19)	(0.15)	(0.24)	(0.14)	(0.16)
Average Village Population	0.003	-0.004	**0.14****	**0.01***	**0.03****	**0.17****	-0.002	-0.001	**0.24****	**0.01****	0.01	**0.21****
	(0.003)	(0.003)	(0.06)	(0.01)	(0.01)	(0.02)	(0.003)	(0.01)	(0.06)	(0.002)	(0.004)	(0.05)
Number of Villages	-0.01	**-0.05****	**-0.37***	-0.02	-0.01	-0.02	**-0.15****	**-0.03****	**-0.51***	**0.01**	**-0.05****	**-0.42***
	(0.05)	(0.01)	(0.08)	(0.02)	(0.01)	(0.01)	(0.04)	(0.01)	(0.07)	(0.04)	(0.01)	(0.06)
Political Fragmentation	-0.19	-0.11	-0.06	-0.05	-0.004	0.002	0.002	0.10	0.02	-0.08	-0.01	-0.05
	(0.09)	(0.10)	(0.06)	(0.05)	(0.05)	(0.01)	(0.06)	(0.08)	(0.05)	(0.06)	(0.07)	(0.04)

Additional explanatory variables: State dummies, rainfall, dummy for constituencies with a coastline, minimum temperature, maximum temperature, fraction of area under sands, fraction of geographical area barren or rocky, and fraction mountainous, and level of the public good in 1971 for the 1971 level are in table 3e.

Note: * and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.

Table 3e: Convergence in the Availability of Public Goods, 1971-1991.	
Coefficients and standard errors on the initial level of each public good (from the estimation of equation 6)	
Public good	**Level of the Public good in 1971**
Primary Schools	**-0.31****
	(0.04)
Middle Schools	**-0.2****
	(0.07)
High Schools	0.05
	(0.15)
Health Centers	**-0.76****
	(0.06)
Dispensaries	**-0.55****
	(0.09)
Hospitals	**-0.69****
	(0.12)
Maternity and Child Welfare Centers	**-0.45****
	(0.19)
Family Planning Centers	**-0.68****
	(0.11)
Wells	**-0.23****
	(0.03)
Piped Water	**0.41****
	(0.13)
Tanks	**-0.31****
	(0.04)
Electricity	**-0.64****
	(0.05)
Phone Connections	-0.54
	(0.38)
Post Offices	**-0.12****
	(0.06)
Paved Roads	**-0.31****
	(0.05)
Note: * and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.	

Table 4: Robustness Checks								
Dependent Variable: Fraction of villages with the public good in 1991 - fraction of villages with the public good in 1971								
	Equation (6)		**With Agricultural Yields (1956-1961)**		**Using the 1961 level of each public good as an Instrument**		**Without Population Density and Constituency Size**	
	Scheduled Tribes	1971 level	Scheduled Tribes	1971 level	Scheduled Tribes	1971 level	Scheduled Tribes	1971 level
Primary Schools	0.11	**-0.31****	0.06	**-0.29****	0.04	-0.18	0.13	**-0.22****
	(0.08)	(0.04)	(0.09)	(0.04)	(0.08)	(0.16)	(0.09)	(0.03)
Middle Schools	**-0.21****	**-0.20****	**-0.21****	**-0.27****	**-0.17***	**-0.69****	**-0.28****	-0.03
	(0.09)	(0.07)	(0.09)	(0.08)	(0.10)	(0.23)	(0.10)	(0.06)
High Schools	0.01	0.05	0.02	0.24	-0.23	**-3.03****	-0.005	0.17
	(0.04)	(0.15)	(0.04)	(0.17)	(0.17)	(1.21)	(0.04)	(0.10)
Health Centers	**0.03****	**-0.76****	**0.03****	**-0.90****	0.06		**0.03****	**-0.70****
	(0.01)	(0.06)	(0.01)	(0.06)	(0.11)		(0.01)	(0.05)
Dispensaries	-0.03	**-0.55****	-0.002	**-0.61****	0.05	0.36	-0.03	**-0.42****
	(0.03)	(0.09)	(0.02)	(0.08)	(0.07)	(0.45)	(0.03)	(0.09)
Hospital	-0.02	**-0.69****	-0.01	**-0.28****	-0.01	**-1.00****	**-0.04****	**-0.23****
	(0.02)	(0.12)	(0.01)	(0.06)	(0.02)	(0.33)	(0.02)	(0.08)
Maternity and Child Welfare Centers	0.01	**-0.45****	**0.04****	**-0.46****	-0.04	-0.22	0.01	**-0.38****
	(0.02)	(0.19)	(0.02)	(0.15)	(0.04)	(0.35)	(0.02)	(0.16)
Family planning Centers	**-0.09****	**-0.68****	**-0.05***	**-0.36****			**-0.09****	**-0.73****
	(0.03)	(0.11)	(0.02)	(0.11)			(0.03)	(0.12)
Wells	-0.12	**-0.23****	-0.20	**-0.24****	0.20	-0.47	-0.04	**-0.21****
	(0.17)	(0.04)	(0.19)	(0.04)	(0.28)	(0.30)	(0.17)	(0.04)
Piped water	**-0.24***	**0.41****	**-0.31****	**0.46****			-0.21	**0.39****
	(0.13)	(0.13)	(0.14)	(0.14)			(0.13)	(0.14)
Tanks	-0.03	**-0.31****	-0.13	**-0.36****	0.24	-0.27*	-0.01	**-0.31****
	(0.11)	(0.05)	(0.12)	(0.05)	(0.20)	(0.10)	(0.11)	(0.05)
Anypower	0.10	**-0.65****	0.17	**-0.65****			0.01	**-0.60****
	(0.11)	(0.05)	(0.12)	(0.06)			(0.11)	(0.05)
Phone	**-0.34****	-0.54	**-0.22****	0.54			**-0.36****	0.07
	(0.11)	(0.38)	(0.08)	(0.49)			(0.11)	(0.31)
Post-office	0.00	**-0.12****	-0.01	-0.02	0.06	0.13	0.02	-0.07
	(0.08)	(0.06)	(0.09)	(0.07)	(0.11)	(0.18)	(0.08)	(0.06)
Paved Roads	**-0.25****	**-0.31****	**-0.21****	**-0.39****			**-0.36****	**-0.17****
	(0.10)	(0.04)	(0.10)	(0.05)			(0.11)	(0.04)
Primary Health Sub-centers	**-0.10***	0.00	**-0.13****				**-0.15****	
	(0.06)	(0.00)	(0.07)				(0.07)	
Note: * and ** indicate that the coefficients are statistically significant at the 5% and 10% level respectively.								

Table 5: The Two Biggest Influences on the Availability of each Public Good.

Marginal Effects are Based on one Standard Deviation of each Explanatory Variable

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

	Effect-1	**Influence- 1**	**Effect-2**	**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
Primary Health Centre	0.046	Average Village Population	-0.016	Scheduled Tribes

Note: Blank Cells indicate the absence of a second statistically significant explanatory variable.