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# Poverty, Heterogeneous Elite, and Allocation of Public Spending: Panel Evidence from the Indian States

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# Poverty, Heterogeneous Elite, and Allocation of Public Spending: Panel Evidence from the Indian States♣

## (Revised version)

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*Abstract*: In this paper, we explore how in the world's largest democracy, India, the presence of different elite groups – the dominant landed and capitalist elite and the minority elite (who are the elected representatives of the marginalised women and low caste population) – could affect the nature and extent of public spending on various accounts, especially education. Our results suggest that the dominant landed elite tends to be unresponsive to the underlying poverty rate while the capitalist elite respond to the poverty rate by increasing the share of education spending. After controlling for all other factors, presence of the minority elite has a limited impact, if at all. Results are robust to alternative specifications.

*Keywords*: Literacy rates, Landed elite, Capitalist elite, Minority elite, Marginalised poor, Public education spending, Panel estimates, Endogeneity bias, Indian states.

*JEL classification*: I28, J15, O15, P48.

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# Poverty, Heterogeneous Elite, and Allocation of Public Spending: Panel Evidence from the Indian States

## 1. INTRODUCTION

Differences in the ideology and support-base of politicians elected in a well-functioning democracy are a possible mechanism through which a country's social and institutional structure could influence the allocation of public spending. This is because it is difficult for a democratically elected government to be unresponsive to the needs of their electorate, especially when the latter are well-informed and politically aware. However, even in such democracies, certain elite groups could influence key aspects of decision-making. In this paper, we explore how in the world's largest democracy, India, the presence of different elite groups – the dominant landed/capitalist elite and the minority elite[1] – could affect the nature and extent of public spending in general, and on education, in particular. We argue that although spending on primary education – like spending on public health or nutrition programmes – benefit the poor, investment in education is different from most other forms of public spending in that it involves empowerment of the general population through the acquisition of knowledge and human capital, which could be at variance with the interests of the elite with vested interests. We use state-level panel data for the period 1960-2002 to examine this issue, which thus far remains rather unexplored.

There is now a growing political economy literature on factors governing the provision of public goods and services in India. Some of this literature highlights the importance of characteristics of the local councillors in the allocation of local public spending in a way that favours the social classes they represent. For example, Chattopadhyay and Duflo (2004) highlight the role of female council leaders in the allocation of drinking water in the community, while Bardhan et al. (2008) find that the village councils with a leader from the scheduled castes (SC) or scheduled tribes (ST)

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[1] While the dominant elite could constitute the landed or capitalist elite, the minority elite in our analysis refers to elected representatives of the marginalised people, namely, women and the low caste population, who have some legislative power by virtue of being elected as members of the Assembly (see further discussion in section 2).

tend to receive more credit from the Integrated Rural Development Programme (IRDP). [2] This is in line with Pande (2003) who found that increasing SC/ST reservation at the state assembly is associated with significantly higher transfers to the SC/ST population, leading to higher total developmental spending. Besley *et al*. (2004) find that for high spillover public goods (such as the access road to a village), the residential proximity to the head of the Gram Panchayat matters, while for low spillover goods, what matters is the underlying preference of the head. In contrast, Foster and Rosenzweig (2001) further highlight the differential preferences between the landed and the landless in the decision making process: while landowners would typically favour expenditure on irrigation, there would be a shift towards (labour-intensive) road construction projects as the landless participate more in decision-making. In an attempt to investigate the role of the heterogeneous elite on public spending in the Indian states, we integrate this literature by including landed, capitalist as well as minority elite with a view to examining their attitude towards the marginalized poor.

Second, an important focus of our analysis is to explore the effects of the heterogeneous elite on public spending on education in the Indian states, which is not the central theme in the existing literature on various local public goods that highlight a community's access to drinking water, village roads, IRDP credit or SC/ST employment. This is partly because education is under the purview of both central and state governments in India, though the latter assume much more responsibility towards education.[3] Both researchers and policy-makers agree that increasing the stock of human capital is essential to boost the rate of growth of any economy; in contrast, low education has long-term implications for poverty, reduction of which remains an avowed objective of the government of India for much of the post-independence period. India is an important case in point where inter- and intra-state disparities in literacy rates are striking. Gender inequity continues to remain a serious problem in all the states, though it is far worse in the worse-performing ones; the gender gap is only about 7% in Kerala while it is more than four times (30%) in Rajasthan and Bihar. The situation is even

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[2] But this need not necessarily be the case. For instance, Bardhan *et al*. (2005) found that presence of a Pradhan (leader) from a minority community may still be associated with negative effects on expenditure on employment-generating programmes.

[3] The share of state to total government expenditures in India for our sample period is typically above 50% (e.g., see Rao and Singh (2001).

worse among the SC/ST population and especially their women. While females constitute about 48% of the Indian population of more than a billion in 2001, about 24% belong to the scheduled castes and scheduled tribes category. Thus, the question remains as to why the marginalised groups of women and low-caste people in the Indian states may not obtain the full attention of their politicians in a democracy even when they have the numerical strength. Among the existing studies, Pande (2003) found that reservation of ST has a significant negative impact on education spending in Indian states, while the effect of reservation of SC is insignificant, (see her Table 6, though this result was not highlighted in the paper).[4] This is a rather unexpected result and remains to be explained. We argue that this perverse result could be explained by the presence of heterogeneous elite with conflicting interests, even after controlling for all other factors including ethnic heterogeneity. Although our central focus is to explore the role of heterogeneous elite on public spending on education, we also examine if similar results hold for the case of total public spending on development (of which education is a part), and also for non-developmental expenditure (see further discussion below).

Our analysis crucially rests on a classification of the state population into heterogeneous groups including the dominant landed and capitalist elite, the minority elite (elected women and low caste representatives in the local assembly) and the marginalized poor. The underlying theme is that within a democratic set-up, heterogeneous elite groups compete with each other for a fair share of the state surplus subject to the underlying poverty rate, reduction of which remains an important objective of successive Indian governments during much of the study period. We argue that the limited and/or perverse impact of the minority elite to influence public policy in Pande (2003) could be better explained by taking account of the position minority elite relative to the dominant (landed and capitalist) elite (one cannot however exclude the possibility that the dominant elite may still dominate the public policy decisions, even in the world's largest democracy). None of the existing empirical studies that we are aware of have, however, explicitly accounted for the influence of the dominant landed and capitalist elite while assessing the role of the minority elite on public spending on education. It is,

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[4] Chin and Prakash (2009) extend Pande (2003) to examine the effects of political reservation on state poverty rates in the Indian states for the period 1960-92 and find that increasing share of ST seats significantly lowers poverty, though the effect of SC seat reservation remains insignificant.

however, an open empirical question as to whether and how the presence of the dominant (landed and capitalist) and the minority elite could promote the interests of the poor in the allocation of public spending on education, developmental and non-developmental accounts.

Why may heterogeneous elite affect public spending differently? The dominance of such elite that do not support the investment in human capital in the masses is a theme in several recent papers (e.g., Bourguignon and Verdier, (2000)). The argument is that the oligarchy will oppose widespread education because educated people are more likely to demand political power, thus undermining the dominance of the elite. The result could be lower public spending on mass education, and hence the persistence of illiteracy. It is also important to make a distinction between the landed and the capitalist elite. As Galor and Moav (2006) argued, the productive cooperation between capitalists and workers was instrumental in the provision of public education for the masses. Since firms have limited incentive to invest in the general human capital of their workers, the level of education would be sub-optimal in the presence of credit market imperfections unless it is financed publicly. Thus the capitalist (unlike the landed) elite could favour the tax-funded public provision of human capital. Thus set against the null hypothesis that the landed or the capitalist elite do not promote public spending on mass education, we posit that the presence of landed elite could lower education spending while that of the capitalist elite would promote it. We also examine the responses of the landed and capitalist elite towards the underlying poverty, as poverty alleviation has remained an important objective of successive Indian governments as is highlighted in the 'Garibi Hatao' programme launched in the mid 1970s.

The minority elite, by contrast, are likely to originate from the poorer section of the population. In particular, women and low caste representatives have lower incomes and are over-represented in Indian poverty estimates and are thus likely to be more risk-averse than the general population. It is, therefore, expected that they would benefit more from the redistributive public spending (including education spending), and hence may want to lobby for such spending (Lott and Kenny (1999)). In other words, set against the null hypothesis that the minority elite do not influence education spending, the alternative hypothesis is that they would favour any redistributive spending to help their social

classes, which is also in line with the poverty reduction objective. We also examine the joint significance of these hypotheses pertaining to different elite groups in question and we do so with a view to exploring the possibility of a relationship between different elite groups in question.

In addition to the determination of the share of education spending, we examine the influence of the elite groups on total development spending (as a share of state domestic product). This is because total development spending comprises not only of spending on education, but also that on health, family and community welfare. While some elite may dislike investing in mass education, they may not have the same sort of reservations about other components of total development spending, so that their joint influence on total development spending may differ from that on education spending as such; we empirically explore whether this is indeed the case in our sample.

Finally, we consider whether the presence of heterogeneous elite groups may exert any influence on changes in non-developmental spending in the sample states. The underlying argument is that the political influence of the dominant (landed and/or capitalist) elite may give rise to an emergence and persistence of inefficient political regimes even in a democracy that may connive with the minority elite to reduce the amount of redistributive public spending, thus resulting in higher non-development spending (e.g., see Acemoglu *et al*. (2007)).  The latter justifies our interest to examine if different types of elite (vis-à-vis the poor) may indulge in higher public spending on non-developmental items in the states (also see Sachs *et al*. (2000)).

Given that this is an empirical exploration, in the absence of any prior, we allow the data to choose if any of the above hypotheses are valid in our sample. Our analysis is based on state-level data for the period 1960-2002 from 16 major Indian states generated from various existing and official sources (see section 2). An important part of our exercise is the identification of the elite – we devise various measures and check the robustness of these measures using both parametric and non-parametric techniques. The data points are the election years.[5] The idea is that elected politicians will want to attain their targets by the time of the next election when the electorate decides whether to re-elect them. This justifies use of a first-difference regression equation determining

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[5] As mentioned later, we also ran some regressions using annual data as a robustness check.

changes in public spending (on different accounts) in terms of a number of explanatory variables which are lagged by 4-6 years (i.e., one election period). The advantage of using a first difference model is that it allows us to minimize the extent of potential reverse causality and the resulting endogeneity bias, if any.

Our central results are robust to additional controls and model specifications (see further discussion in section 3), and highlight the differential impact of different groups of elite in our sample, which also varies among different accounts of public spending that we consider. While a higher proportion of capitalist elite (by itself) does not have a significant impact on education spending, we do find fairly strong evidence of the capitalist elite boosting educational spending as a response to higher poverty. In contrast, a higher proportion of land held by the top 5% does not have a significant impact on changes in education spending; and there is no evidence of it rising when we consider the response of the landed elite to higher poverty. Once we control for the presence of the dominant landed/capitalist elite, the effect of the minority elite as regards public spending on education in our sample tends to be insignificant across specifications. If, however, we consider the changes in developmental spending, a greater share of land held by the top 5% of the population significantly increases developmental spending though the landed elite tends to be unresponsive to the presence of higher poverty rates per se (the interaction term being insignificant in all specifications). As with education spending, the capitalist elite, however, continue to exert a positive influence on developmental spending as a response to higher poverty. Presence of both landed and capitalist elite tend to be associated with significantly higher non-developmental spending in a way that is quite similar to the manner in which developmental spending is related to the two types of elite. This confirms that the real difference in the pattern of spending of the two types of elite is encapsulated in regard to educational spending, thus lending some support to Galor and Moav (2006).

The paper is organised as follows: section 2 describes the data and characterises the different categories of elite in India; section 3 develops the empirical model, reports the results and explains these in the light of the hypotheses on elite dominance; and section 4 concludes.

## 2. DATA DESCRIPTION

Our analysis focuses on the 1960-2002 period (see Appendix for data sources for different regression variables). The data-set used in the paper is generated by using state-level economic and political variables available from the World Bank (Ozler, Dutt and Ravallion (1996), Besley and Burgess (2000) and Butler, Lahiri and Roy (1996)) for the period 1960-1994. We then update this data for the period 1995-2002 using information available from the Reserve Bank of India, National Sample Survey (NSS 50th and 55th rounds), Election Commission of India and also state-level information on the party of their successive Chief Ministers.

A state-level analysis is appropriate here, as the Indian states have considerable decision-making powers for most social sectors including education, health, community and social services. We choose the data points to be the election years because it takes time for different groups of elite to affect changes in public spending on various accounts.[6] The idea behind this is that elected politicians will want to attain their targets by the time of the next election when the electorate decides whether to re-elect them. In most cases elections take place every five years, though there can be an election before the next scheduled one if the government in power collapses. There can be problems in the estimates if, for example, policies implemented in year four take a further two years to complete, so that the model will assign the effect to the next election cycle (also see econometric issues to be dealt with because of the unbalanced nature of the data). While we need to be cautious in interpreting these results, one election cycle lag appears to be the best available option.

### 2.1. The Dominant Elite

India is an interesting case in point where social, economic and political dominance of the elite (landed/capitalist/both) is closely interlinked not only with the distribution of land and non-land resources but also with the age-old institution of religion, caste and gender. Without any loss of generality, we define the dominant elite to be the rich with more land or capital or both, who are at the top end of the income distribution. In our attempt to

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[6] Although in our main set of regressions, our data points are the election years, as a robustness check we also make use of the annual data on each variable for the period 1960-2002, in some regressions (see Table 7).

understand the potential roles of heterogeneous elite on public spending, we need to classify each elite group carefully, which is explained below.

### 2.1.1. Landed elite

Land is both the main productive asset and the basis of survival of the majority of the population in India still today, especially in rural areas. Thus land tenure is the foundation of social structure and political power. One could form some idea of economic dominance of the elite, especially in the rural areas, from the distribution of land in these states. Table 1 shows the average percentage of total land area held by the top 5% and the bottom 40% of the population, and also the Gini coefficient in the distribution of land (LANDGINI) over 1960-2002. Since there is very little variation in the Gini index of land distribution, we use land held by the top 5% of the population (TOP5) as an index of economic dominance of the landed elite; in particular, a greater share of land held by the top 5% of the population will imply greater dominance of the landed elite.[7]

### 2.1.2. Capitalist elite

One needs to distinguish the capitalist elite from the landed elite, especially in the context of industrial development that gathered pace in India since the late 1970s. Firm ownership in developing countries is not only more concentrated than in the West, but often concentrated within family holdings. India has been no exception where leading families (e.g., Tata, starting in the 1900s) typically own controlling shares, either directly or through cross-holdings of firms belonging to the same business group (BGs).[8] Private sector companies associated with business groups had significantly higher concentrated family ownership and substantial assets (Khanna and Palepu (2004)).

It is, however, not possible to obtain the state-level information on predominance of business groups over 1960-2002, primarily because publicly-traded listed firms were

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[7] We also used the percentage of land held by the bottom 40% of the population in our empirical analysis, but it never turned out to be significant. That is why these results are not reported.

[8] The Tata Group of India, for example, has member firms that operate in the steel, automobile, telecom, software, beverages and leisure industries, among others. In some cases, business groups were created to help create internal capital markets in environments where capital markets as such were imperfect. In other cases, they were responses to regulatory barriers (e.g., the Monopolies and Restrictive Trade Practices Act in India) that did not allow expansion of operations in one industry, forcing firms to become conglomerates, i.e., expanding in other, sometimes unrelated, industries.

not required to disclose their identity until very recently. Also the same business group can operate in many states and hence it is not possible to trace them to a particular state. Consequently, the measure used to identify the presence of the capitalist elite in our study relates to the share of *registered* (as opposed to unregistered) manufacturing output in net state domestic product as firms in the registered manufacturing sector[9] are typically larger than those unregistered and a significant proportion of them are publicly listed. The idea is that states with a higher share of registered manufacturing output have greater capital investment often made by the controlling owners, which indicates a greater presence of capitalist elite. This is also supported by the fact that the correlation coefficient between factory fixed capital and net state domestic product from registered manufacturing turns out to be 0.98 in our sample, and it is also significant at less than the 1% level.[10]

Using the recent 2005 business group information available from the Centre for Monitoring the Indian Economy (CMIE), we have also been able to trace the number of listed firms registered to some business groups by state (see Table 1).[11] Clearly, the predominance of business group membership is most visible in the most industrialized states like Maharashtra, Tamil Nadu and Gujarat as opposed to Assam, Bihar, Orissa, etc. Assuming that this could be considered as a proxy for capitalist predominance in the state over this period (given that business group affiliation generally does not vary much over time), we calculated the correlation between this measure and the share of registered manufacturing in our sample; the correlation turns out to be 0.74 and is also highly statistically significant at less than the 1% level. Accordingly, in the absence of a better indicator, we accept that the share of registered manufacturing output in state domestic product could be a reasonable proxy for capitalist predominance in the state.

## 2.2. Minority elite

Although many other nations are characterized by social inequality, perhaps nowhere else in the world has inequality been so elaborately represented as in the Indian institution of

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[9] This definition corresponds to the definition of a factory in the Factories Act of 1948. All registered firms need to register with Industrial Inspectorates in each state and are surveyed on an annual basis by the Annual Survey of Industries.

[10] Another possibility would be to consider the share of private to public companies in the state as a measure of capitalist elite; official sources however do not publish this information.

[11] Unfortunately, this information is not available for the entire study period, 1960-2002.

caste. Castes are ranked, named, endogamous (in-marrying) groups, membership in which is achieved by birth. Many castes are traditionally associated with an occupation, such as high-ranking Brahmans (priests); middle-ranking farmer and artisan groups, such as potters, barbers, and carpenters; and very low-ranking leatherworkers, butchers, launderers, and latrine cleaners. The Indian constitution classifies the low caste population into SC and ST. Many SC/ST people lack assets and live in conditions of abject poverty and social disadvantage. Deshpande (2001) has constructed a composite caste deprivation index (CDI) for India that includes landholding, assets, livestock, education, and occupation to argue that caste development is consistently worse for the SC and ST.

There is conflicting evidence about the role of women in India. The constitution of modern India guarantees equal rights to men and women. India has been one of the first countries in the world to confer voting rights to its women. There is, however, a parallel body of evidence that seems to challenge this positive view (Menon-Sen and Shivkumar (2001)). While the Indian Constitution of 1950 ensures reservation of jurisdictions in favour of the Scheduled Castes and Scheduled Tribes in the state legislature as well as union Parliament, as yet there has been no reservation for women at these levels. It was only the 73rd amendment of the Indian Constitution in 1993 that allowed reservation of seats for women in the village council, following which, discussion is now under way about the reservation of seats for women at the state and national levels as well.

Our measures of the *minority elite* pertain to the proportions of women and scheduled caste/tribe legislators in the ruling party as shares of total seats won by the ruling party in the state assembly. While this is different from the measure used by Pande (2003), for example, we believe that this is the pertinent measure as these are the people at the margin who could in principle influence policy decisions of the government in favour of their social classes. The average values of these measures of political elite dominance in our sample are summarized in Table 1, which particularly highlight the low representation of women in all the sample states over this period.[12] While political

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[12] As possible alternatives, we also considered proportions of (i) women and scheduled caste/tribe legislators in the ruling party as a share of all women and scheduled caste/tribe legislators in the state

reservation of SC/ST in the government represents their population shares, in the absence of any political reservation, women's representation continues to be very marginal in the sample states (see Table 1, and further discussion below). Very often the minority elite co-opt for the dominant elite (landed/capitalist) in politics and fail to be spokespersons for their own social classes.[13] Thus the gender/caste gap persists in political representation.

## 2.3. The marginalised poor

Setting aside the dominant and the minority elite, there remains the masses of the poor. Marginalised groups of women (especially widows) and low caste households groups are often over-represented in poverty (Drèze and Srinivasan (1997); Parker and Kozel (2007)). We include state-level poverty head count ratio to account for the poor in a state.[14]

Poverty remains an endemic problem in India, which is linked to economic, social and cultural factors that interact to maintain long-term structural disparities in the distribution of resources and social opportunities. The poor are found to be a highly heterogeneous group: they have limited physical assets (e.g., land), low education and often suffer from health problems. They are also deprived of formal/informal system of support and social capital (Parker and Kozel (2007)). Despite their numerical strength, the voices of the poor are not generally heard through the ballot box as their average turnout in all elections tend to be much lower than the general population.

## 3. EMPIRICAL ANALYSIS

Our analysis is developed in three steps. Section 3.1 explains the methodology, while we report and analyse our results in sections 3.2-3.4.

We start our analysis with some non-parametric Kernel fits. The advantage of the

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assembly; (ii) proportions of women and scheduled caste/tribe legislators in the ruling party as a share of total reserved and unreserved seats respectively. However, the results obtained were rather similar.

[13] A number of factors continue to constrain minority participation at all levels of administration including their lack of political experience and public skills, threat of violence, motion of no-confidence often brought by male/upper caste members. Also see Weiner (2001).

[14] Following the large household-level evidence in the low-income countries (e.g., see Glewwe and Jacoby (2004)), some may also argue that the poor have lower demand for education. Thus, poverty is likely to be associated with lower spending on education.

non-parametric approach is that it does not specify the functional form; rather it allows the data to determine its nature. We consider the bivariate relationship between (a) land held by top 5% of the population and changes in education spending, and also that between (b) share of manufacturing and changes in education spending for each state, and in each case use kernel regression to generate a bivariate kernel fit between each pair of variables. These fitted lines are shown in Appendix Figure 1 for selected states over the sample period. In general, the relationship tends to be negative for (a) and positive for (b). There are some exceptions too: e.g., relationship (a) is much flatter in Haryana and Maharashtra than AP and Orissa while some non-monotonicity is observed with respect to (b) in most states illustrated. We shall examine the nature of these relationships using parametric methods that we explain in section 3.1 below.

## 3.1. Methodology

This section explains the empirical models and the associated econometric issues that we try to address.

### 3.1.1. Empirical model

Our objective in this paper is to examine the factors determining the changing share of state spending on education, development and non-development account of total state spending (as a share of state output). Taking the share of some account of public spending in relation to state domestic product allows us to control for a state's wealth/prosperity. Using the election years as data-points, we choose the change in the value of the particular component of public spending (as share of state domestic product) from the last election to be the dependent variable. This differenced variable allows us to examine how the ruling political regime would change the behaviour of the government in power (since the last election) while the level variable would simply reflect the correlation among measures of different groups of elite and the public spending (on different accounts). Using the first difference of the state spending on education also allows us to control for the state-specific unobserved heterogeneity and thus to reduce the problem of potential endogeneity arising from unobserved heterogeneity (see further

discussion below). This is in line with much of the cross-country literature analyzing economic growth or aspects of fiscal policy (see, for example, Devarajan *et al.* (1996), Gupta *et al.* (2005)).

Accordingly, we determine changes in any account of public spending (i.e., education, development and non-development), $\Delta Y_{it}$, as a function of lagged values of the explanatory variables, $X_{it-1}$, where the lag chosen is one election period.

$$\Delta Y_{it} = \Lambda' X_{it-1} + \xi_i + \psi_t + \varepsilon_{it} . \qquad (1)$$

where $\xi_i$ are the state-specific fixed effects while $\psi_t$ is the time fixed effect. Use of one election-period (i.e., 4-6 years) lagged explanatory variables, including measures of elite dominance in the determination of changes in education spending would minimize the possibility of endogeneity bias in our analysis (related econometric issues are discussed below). We use fixed effects (both state and time fixed-effects) panel data model to determine the first differences in the public spending on education, development and non-development accounts during 1960-2002. As we have quite an unbalanced panel where election years could vary across the states, we cluster all standard errors at the state-level (as do Bertrand *et al.* (2004)), which corrects for any correlation in errors within a state; otherwise OLS estimates could be biased.

### 3.1.2. Explanatory variables

We use the same set of explanatory variables to determine the effect on the three dependent variables of our choice, namely, the changing share of education spending, developmental spending and non-developmental spending.

In order to test our central hypotheses pertaining to the presence of three groups of elite, we first include the measures of landed (TOP5), capitalist (MFG) and minority elite measured by the shares of SC/ST (PSCST) and Women (PWOM) members of the legislative assembly in the ruling government. Presence of the poor is measured by the state-level poverty head count ratio HCR. In addition, we include the interactions between TOP5 and HCR (TOP5*HCR) and also that between MFG and HCR (MFG*HCR) with a view to explore the responsiveness of the landed and the capitalist elite, respectively, to the underlying poverty rates. Note however that we do not include any interaction between poverty and the shares of minority elite, namely, PSCST and

PWOM, as these minority elite themselves belong to the poorer section of the population and are therefore assumed to lobby for their own population groups.[15]

Thus, expanding equation (1), we can express the *changes in public spending on education* $(\Delta PS_E)_{it}$ in the i-th state in the t-th election year as follows:

$$(\Delta PS_E)_{it} = \alpha(PS_E)_{it-1} + \beta(TOP5)_{it-1} + \gamma(MFG)_{it-1} + \eta(HCR)_{it-1} + \theta(TOP5*HCR)_{it-1} +$$
$$\phi(MFG*HCR)_{it-1} + \mu(PWOM)_{it-1} + \nu(PSCST)_{it-1} + \lambda(ETHHETY)_{it-1} + \xi_i + \psi_t + \varepsilon_{it} \quad (2)$$

Among other control variables, $PS_E$ is the initial value of public spending on education while ETHHETY denotes the index of ethnic heterogeneity. We include the initial value of public spending on education to capture convergence, if any, in the level of this spending among the states over time, conditional on values of other covariates. A negative (positive) sign on its coefficient would indicate convergence (divergence).

Ethnic heterogeneity has been identified as a key control variable in some previous studies. There is some recent literature that stresses the link between ethnic fractionalisation and the poor delivery of public services; the relationship could be attributed to taste differences of different sections of the population (Alesina, Baqir and Easterly (1999)), unequal distribution of the benefits from public goods (Khwaja (2008)) and/or inability to impose social sanctions in ethnically diverse communities (e.g., Miguel and Gugerty (2005)), thus leading to failures in collective action. Extending this argument to the case of public goods provision in the Indian districts, Banerjee and Somanathan (2001) have suggested that more heterogeneous communities tend to be politically weaker, and therefore are less likely to be denied the goods they want and more likely to get some of the inferior substitutes. We construct a direct composite measure of ethnic fractionalisation from the population proportions belonging to various ethno-religious groups including upper caste Hindus, scheduled caste, scheduled tribes, Muslims, Jains, Buddhists, Christians, Sikhs and others, using $1 - \sum p_i^2$, where $p_i$ is the share of the particular population group. It is expected that the coefficient of this variable would be negative in the determination of change in education spending. This is because a greater degree of heterogeneity would mean that the ruling party caters to a smaller

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[15] This is further supported by the fact that even when we include these interaction terms, they were never significant in any specification.

segment of the total population with a lower provision of public goods/services (also see Table 2).[16] We augment this baseline regression in various ways to check the robustness of our estimates (see section 3.1.3).

Let us consider the possible effects of our key variables pertaining to the potential response of heterogeneous elite to poverty while determining the changes in public spending on education. Important parameters of our interest are $\theta$, $\phi$, $\mu$ and $\nu$ so that the null and the alternative hypotheses with respect to these four parameters in the determination of changes in education spending are as follows:

$$
\begin{aligned}
&H_0: \theta = 0; &&H_1: \theta < 0; \\
&H_0: \phi = 0; &&H_1: \phi > 0; \\
&H_0: \mu = 0; &&H_1: \mu > 0; \\
&H_0: \nu = 0; &&H_1: \nu > 0;
\end{aligned}
\tag{3}
$$

It, therefore, follows that unlike the landed elite, there is a common ground between the capitalist elite and the minority elite at least with respect to education spending. This is tested by the sign and significance of the individual coefficients.

We also perform the joint test of significance of these coefficients with a view to explore if the responses of some elite groups may coincide in this respect:

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\begin{aligned}
&H_0: \theta = \phi = 0; &&H_1: \theta \neq \phi \neq 0 \\
&H_0: \mu = \nu = 0; &&H_1: \mu \neq \nu \neq 0 \\
&H_0: \theta = \mu = \nu = 0; &&H_1: \theta \neq \mu \neq \nu \neq 0 \\
&H_0: \phi = \mu = \nu = 0; &&H_1: \phi \neq \mu \neq \nu \neq 0 \\
&H_0: \theta = \phi = \mu = \nu = 0; &&H_1: \theta \neq \phi \neq \mu \neq \nu \neq 0
\end{aligned}
\tag{4}
$$

Further, we examine the validity of hypotheses (3) and (4) with respect to total development spending (as a share of state domestic product) using the same specification as in (2). This is because total development spending comprises not only of spending on education, but also that on health, family and community welfare. While some elite may dislike investing in mass education, they may not have the same sort of reservations about

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[16] We also tried including an indicator variable measuring if the state government is aligned to the government at the centre. INC has remained in power at the centre during most of this period, except 1977-80 (Janata Party rule), 1989-90 (National Front coalition government). Thus the binary variable takes a value 1 if the party in power at the state assembly is also the party in power at the centre and 0 otherwise. Alliance with the union could be important in determining both earning and spending patterns of the state (e.g., see Khemani, 2003). But the variable was never significant in explaining change in state level spending and that is why we exclude it from the final specification.

other components of total development spending. It is thus interesting to see whether any of these hypotheses hold for the allocation of total development spending in the states as well.

Finally, we consider the validity of hypotheses (3) and (4) for determining the changes in non-developmental spending in the sample states using the same specification as in (2); the latter has been motivated by Sachs *et al*. (2000) who observe a steady increase in non-developmental spending in the Indian states. The underlying argument is that the political influence of the dominant elite may give rise to an emergence and persistence of inefficient political regimes even in a democracy that may connive with the minority elite to reduce the amount of redistributive public spending, thus resulting in higher non-development spending (e.g., see Acemoglu *et al*. (2007)).

Section 3.2 focuses on changes in share of education spending, section 3.3 instead considers changes in share of development spending while section 3.4 examines the changing share of non-developmental spending respectively. We however retain the same set of explanatory variables as in equation (2) above to determine changing share of development (section 3.2) and non-development spending (section 3.3). Means and standard deviations of all regression variables[17] are reported in Table 2.

### 3.1.3. Some econometric considerations

A possible problem pertains to the treatment of unobserved variables and the resulting endogeneity bias. We argue that the (state-specific) fixed effects model, by its very nature, allows us to control for any state-specific unobserved factors that may affect the relationship. So long as these other (omitted/unobserved) variables are state-specific, our estimates would be unbiased. To this end, we include both state and year specific fixed effects. One may however raise the question that these state-specific (unobserved) fixed effects do not control for the possibility of endogeneity being introduced by unobserved time-varying factors that we have not controlled for, especially for measures of the

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[17] Tables 3, 4 and 5 show the final sets of variables that produce the best results for the determination of the changes in education, development and non-development spending. Note that we also experiment with other variables, e.g., presence of coalition government, president's rule or if the party in power at the centre is the same as the party in power in the state; however these variables were never significant in any specification and hence are dropped from the final specification.

dominant/minority elite. In order to test the robustness of our results, further we try to include possible time-varying factors, e.g., share of rural population or alternative time-varying indices of ethnic heterogeneity as reflected in the population shares of female and SC/ST population (see further discussion on model specification below).

One also needs to tackle the issue of reverse causality and the resulting bias, if any. In this respect, we argue that the use of explanatory variables which are lagged one election-period (i.e., 4-6 years), including measures of elite dominance in the determination of changes in education (or other types of) spending, would minimize the possibility of reverse causality and the resulting endogeneity bias in our analysis (also see Devarajan *et al*. (1996), p. 322). Thus, in order for reverse causality to hold in our analysis, ruling elite of any type need to anticipate future spending between four and six years in advance, which could be ruled out without much loss of generality. As an additional check, we undertake an exogeneity test of the measures of elite dominance. In this respect, we follow a regression-based approach suggested by Hausman (1978, 1983); in fact a regression-based test is asymptotically equivalent to the original form of the Hausman test. This is explained below.

The underlying argument is that the problem of reverse causality may stem from the presence of potentially endogenous variables like share of land held by the top 5% of the population (TOP5), share of registered manufacturing (MFG), proportion of SC/ST (PSCST) and women (PWOM) members in the ruling government in equation (2). In an attempt to correct for the potential bias, we proceed as follows. (a) We regress each of these potentially endogenous variables on a set of explanatory variables Z, which is a subset of X in equation (2). Note that Z replaces the particular potentially endogenous variable in X by its relevant instrument. In particular, we instrument TOP5 by the net sown area (as a share of total area) in the state, MFG by the number of registered factory per unit area in the state, PSCST by the population proportion of SC/ST and PWOM by the population proportion of women in the state. Choice of these instruments has been dictated first by data availability, and then by their direct correlation with the potentially endogenous variable together with their likely exogeneity with respect to the dependent variable (i.e., changes in public spending). In addition we include two binary variables in Z, namely, if there has been a coalition government and also President's rule in the state,

which are not included in X.

From the first stage estimates, we obtain the estimated residuals for each of these potentially endogenous variables, namely, TOP5_resid, MFG_resid, PSCST_resid, and PWOM_resid. In the final stage we include these estimated residuals as additional explanatory variables in equation (2). These corrected estimates are shown in Tables 3-5 (see specification 5); insignificance of the estimated residuals establishes the exogeneity of all potentially endogenous variables and their interaction terms in our sample. Statistical insignificance (i.e., the relevant t-statistics) of these estimated residuals would constitute a test of exogeneity. We have also tested the sensitivity of these results by choosing alternative instruments for share of manufacturing, e.g., literacy rate or adult literacy rate. Results remain unchanged, perhaps reflecting the fact that all explanatory variables are 4-6 years lagged values.

Thus for each dependent variable, we estimate five specifications of the baseline model: specification (1) is the baseline regression where in addition to the measures of heterogeneous elite groups, we control for the initial value of the particular spending and the measure of ethnic heterogeneity. Specification (2) augments specification (1) by including the time varying share of rural population. Specification (3) replaces the measure of ethnic heterogeneity by the population shares of SC/ST and women population. Specification (4) augments specification (3) by bringing back the measure of ethnic heterogeneity. Specification (5) is the most complete model which augments specification (4) by including the four residuals for the four potentially endogenous variables in our model with a view to minimize the potential simultaneity bias. All standard errors are clustered at the state-level.

### 3.2. Estimates of changes in education spending

The fixed effects estimates of specifications (1)-(5) are shown in Table 3.[18] A positive

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[18] Given that the 73rd amendment of the Indian constitution took place in 1993, institutions at all levels witnessed some changes in their functions. As responsibility for education became decentralised, district-level personnel, school headmasters and village education committees acquired many new responsibilities. To capture the strength of this effect, we also tried including a dummy representing the post-1993 period in our regressions; our central results remain unchanged while the post-1993 dummy turns out to be positive and highly significant; these results are available on request.

(negative) coefficient estimate would indicate an increase (decrease) in the share of education spending associated with an increase in the value of the particular explanatory variable in the last election year. F-statistics for the joint test of significance of the explanatory variables are significant at less than 1% level in each case, confirming the goodness of fit of the models estimated. As is clear from the last column of Table 3, our test for potential endogeneity of the regressors clearly reveals that the explanatory variables are exogenous, as all the relevant residuals turn out to be insignificant.

Our results indicate that the initial level of education spending is negative and significant in all specifications; thus there is evidence of convergence in public spending on education across the sample states despite the sometimes divergent agenda of the ruling political regimes in these states over the sample period. Second, the coefficient estimate of ethnic heterogeneity is not significant in any of the specifications, contrary to the findings of Banerjee and Somanathan (2007). Third, when population controls are introduced as a robustness check, the coefficient on rural to total population is positive in specifications (3) and (4), and the coefficient on the ratio of female to total population is negative in specifications (3) and (4), though their significance vanishes in the complete specification (5). More importantly, the presence of these explanatory variables does not affect the signs of the coefficients on our key explanatory variables, which we now turn to.

There is clear evidence that poverty rates have a negative effect on education spending, as reflected by the sign of the HCR term, which is robustly significant across all the specifications. This could be a reflection of the under-representation of the poor in the government, lower accountability of the elected members towards the poor (there is often low voter turnout among the poor, who are not politically active), and/or lower demand for education among the poor as has been argued in the micro literature (e.g., see Glewwe and Jacoby (1994)).

To start with our main hypotheses, we consider the estimates regarding the impact of the different categories of elite, *ceteris paribus*. First, we focus on the estimates for the landed elite, using land held by the top 5% of the population as the relevant explanatory variable. A greater share of land held by the top 5% is insignificant in all specifications (as reflected by the estimated β-coefficient). Second, we infer how the landed elite

respond to the underlying poverty rate through the interaction term, TOP5*HCR. This, too, is always insignificant (as reflected by the θ-coefficient) in all the columns of Table 3. Third, in order to capture the impact of the capitalist elite on educational spending, we look at the share of registered manufacturing output (the coefficient γ). The γ-coefficient is not significant in any of the specifications. Fourth, we look at the interaction term, MFG*HCR, which captures how the capitalist elite respond to the underlying poverty rate (as reflected by the ϕ-coefficient), one of the aspects we are particularly interested in. It is quite interesting to note that while the γ-coefficient is insignificant by itself, the ϕ-coefficient is always positive and significant.

To obtain a clearer picture of the marginal (partial) effect of the TOP5 and MFG variables on changes in education spending, using estimates of complete specification (5) of Table 3, we compute the partial derivative of changes in education spending with respect to TOP5 and MFG respectively. These are as follows:

$$\frac{\partial(\Delta PS_E)}{\partial(TOP5)} = \beta + \theta(HCR), \text{ and } \frac{\partial(\Delta PS_E)}{\partial(MFG)} = \gamma + \phi(HCR). \qquad (5)$$

Accordingly, when the poverty head count ratio is held at a particular value (e.g., its sample mean value or its third-quartile value), the marginal effect of TOP5 turns out to be 0, given that $\beta$ and $\theta$ are both insignificant. In contrast, given that the interaction term between MFG and HCR is always positive and significant (= 0.00295 in specification (5)), holding HCR at its mean value (0.4158), the marginal effect of MFG on changes in education spending in this specification turns out to be equal to 0.00295*0.4158 (given that γ is insignificant), and this equals 0.001227. If, instead, we consider its third-quartile value (0.5421), this marginal effect will increase to 0.001599. So, the marginal (partial) effect of MFG reveals that as the HCR rises from its mean to its third-quartile value, the positive education spending effect of MFG remains and becomes larger, indicating that capitalists tend to care about education spending in the presence of higher poverty. Thus, the presence of the capitalist elite is associated with higher education spending, supporting Galor and Moav (2006).

In our paper, an overall positive effect of MFG is interpreted as a beneficial effect of capitalist elite on public education spending in the state, which can be explained in terms of the productive cooperation between capitalists and workers. Given that we have

an imperfect measure of the capitalist elite, one may wonder if this result is compatible with any other alternative interpretation. The question is why an increase in the share of registered manufacturing in the state could boost total educational spending in the presence of poverty. Without much loss of generality, a higher share of registered manufacturing could be taken to be an index of industrialisation in the state. One possibility is to argue that any democratic government may increase spending on mass education as a response to greater industrialisation, with a view to boosting economic growth. But note that the total effect of HCR is negative at the mean value of TOP5 and MFG, as this value is equal to $-0.0008+0*0.3401+0.00295*0.0867 = -0.000544$ (see equation (2) and Tables 2 and 3). Thus, the poorer states tend to have lower education spending, which among other things could reflect a lower demand for education among the poor (e.g., see Glewwe and Jacoby (1994)). Given this negative effect of HCR in our sample, it is unlikely that a democratic government would necessarily boost spending on mass education (but they may do so on other account of development spending) in response to greater degree of industrialisation, thus weakening the validity of this alternative interpretation.

After controlling for the presence of dominant landed/capitalist elite, the share of SC/ST or women MLA in the ruling government fails to have any significant impact on changes in education spending. The latter perhaps validates the general wisdom that a greater degree of minority representation in the ruling government as such cannot by itself induce higher investment in public education (see discussion in section 2.2) in the presence of dominant elite.

While we cannot directly test if the minority elite is aligned with some group of the dominant elite, we can indirectly test if the minority elite have any mandate to serve their people in our sample. In doing so, we examine if the winning seat in the state assembly won by a woman and low caste member is closely correlated with the turnout among female and low caste voters. This is because if there is no such correlation, it would not conceivably be necessary for these members to cater to their communities. Our results (available upon request) do suggest that there is no significant association between turnout among low caste voters and the election of low-caste members in the assembly, after controlling for state literacy rate and ethnic heterogeneity over the study period.

Finally, we test the joint significance of the presence of landed, capitalist and minority elite coefficients as laid in equation (4). The resultant Wald statistics as summarized in Table 6 highlight that we cannot reject any of the null hypotheses as listed in equation (4). In other words, there is no evidence of a coalition between landed and capitalist elite, two groups of minority elite, the landed and minority elite, capitalist and minority elite or for that matter among all three groups of elite on changes in any spending accounts in our sample.

To conclude, the limited impact of the minority elite on public policy can be explained by accounting for the dominant landed and capitalist elite in our framework. Our results thus appear to be compatible with Weiner (2001), page 211: "The incorporation into the political system of backward caste elites and members of Scheduled Castes has apparently done little to reduce the enormous social and economic disparities that persist in India's hierarchical and inegalitarian social order".

## 3.3. Changes in Developmental Spending

Education is only one component of total developmental spending incurred by the Indian states. In addition to education, total development spending also includes spending on health, family welfare, community building, etc. We would now like to see how much our explanatory variables can account for changes in overall development spending, and thereby capture the possible effect of elite dominance on state developmental expenditure. The question also remains if the beneficial role of capitalist elite holds even when education spending is summed with other accounts of development spending.

We include the same set of explanatory variables as in Table 3 to explain changes in total developmental spending; these fixed effects estimates are shown in Table 4. Some results in Table 4 are similar to those in Table 3, notably that the HCR variable is negative and highly significant in all five specifications, and the initial level of development spending is negative and strongly significant in all specifications. None of the measures representing the minority elite (like SC/ST MLA and women MLA) turn out to be significant in determining developmental spending, as was the case with educational spending. As with education spending, capitalists seem to be responsive to the interests of the poor; the sign of the $\phi$-coefficient on the (MFG*HCR) interaction term

is still positive and significant in all five specifications. Also, the effects of ethnic diversity are weak, reflected by the coefficient on the ETHHETY variable as well as the alternative measures like share of SC/ST and share of women in the population.

An interesting difference between Tables 3 and 4 is that the population controls, some of which were significant in a few education spending specifications, now turn out to be insignificant for all the development spending specifications. More importantly, two results are quite different here and need to be highlighted: unlike for the case of education spending, the landed elite clearly tend to favour development spending, and they do so by increasing spending on the developmental account. This is reflected by a positive (and statistically significant) $\beta$-coefficient on the (TOP5) term in all five specifications. However, the landed elite do not respond to higher poverty by increasing their developmental spending, as reflected by the (TOP5*HCR) interaction term being insignificant. The other result is that the coefficient on the share of registered manufacturing is negative and significant at the 5% level for developmental spending in specifications (1) and (2), but then turn out to be insignificant in specification (5), (although, as noted in the previous paragraph, the (MFG*HCR) term is positive and significant in all specifications).

A comparison of the results with respect to the landed and capitalist elite indicates that the landed elite are aware of the need to fulfil the basic requirements of the electorate to enhance their possibility of re-election, and consequently boost developmental expenditure, but do not incur more developmental spending when the poverty rate is higher. By contrast, the capitalist elite generally spend less on development but tend to spend more only when the rate of poverty is higher. In comparing these results with educational spending, it is significant that despite being favourably inclined towards overall developmental spending, the rural elite do not have the incentive to spend on mass education, although their capitalist counterparts do, and certainly while responding to higher poverty.[19] In fact, as far as Table 4 is concerned, none of the changes to the baseline specification in Column (1) affects the regression results in any significant way.

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[19] Recall that in Table 3, the coefficient on (TOP5*HCR) was insignificant, while that on (MFG*HCR) was positive in all the specifications.

### 3.4. Changes in Non-developmental Spending

Finally, in view of the findings of Sachs *et al.* (2000) for India, we shall in this section examine the role of the heterogeneous elite on changes in non-developmental spending (as a share of state output) in the Indian states in our 1960-2002 sample; these results are summarized in Table 5.

First, there is evidence of significant convergence among the Indian states as states with higher initial non-developmental spending tend to have lower changes in spending, thus revealing signs of catching up, as was the case for educational and developmental spending. Second, as with the other two categories of spending, higher poverty translates into lower non-developmental spending, as is clear from the negative and significant sign of the η-coefficient. Third, although the presence of rural elite is associated with higher spending on non-developmental items (as was the case with development spending), the rural elite do not spend more on such items if the underlying poverty rate is higher. In contrast, the presence of capitalist elite is associated with greater spending on non-developmental items in the presence of poverty, as is evident from the sign of the ϕ-coefficient, which shows some kind of a perverse response to the prevalence of poverty (despite exerting a beneficial role as regards education and development spending). As before, representation of women or low castes fails to have any perceptible effect on non-development spending in any specification. The same applies for the various population controls, as was the case with developmental expenditure at the state level.

### 3.5. Fixed Effects Estimates of Annual Data

We finally perform the same exercise as before (i.e., by considering the effects of the same explanatory variables on shares of three types of public spending in turn), but using annual data for the entire sample, 1960-2002. This increases the number of observations by more than three times than in the previous exercise, but worsens the results for educational and developmental spending significantly. Looking at the results of specification (5) – which is the only specification we report – for changes in each spending account in Table 7, one can observe that (in addition to the initial levels of the

respective categories of spending), only the ethnic heterogeneity index turns out to be negative and strongly significant in all the regressions. Strikingly, the ($\beta$, $\gamma$, $\eta$) coefficients in the educational and developmental spending are insignificant, and the same applies for the interaction terms, $\theta$ and $\phi$ as well. The coefficient on initial education/developmental spending is now significant, but the positive sign indicates that there is no catching up. This exercise demonstrates that it is perhaps better for analytical as well as empirical reasons to stick to our original set of results with the data points being election years. This is because, as noted earlier, it takes time for a ruling government to influence changes in any type of spending considered here.

## 4. CONCLUDING COMMENTS

This paper empirically examined the role of heterogeneous elite in determining the pattern of public spending, something that remains little discussed in the literature. India is an important case in point, where decision-making on public spending could be influenced by heterogeneous groups of elite, i.e., the dominant landed and capitalist elite, and the minority elite. While the existing literature highlights the effective role of the minority elite on certain types of public spending, we argue that the effectiveness of the minority elite in influencing any public policy depends on the presence of dominant landed and capitalist elite as well. In particular, we argue that the productive cooperation between the capitalist elite and the workers may induce dominant capitalists to favour spending on education, while the landed elite tend to oppose investment in basic education. This could be because they are fearful of dilution of their political dominance by the educated poor. While the minority elite may tend to favour any redistributive spending, including education, their effectiveness could be limited by their under-representation in the government.

Results using available panel data for the period 1960-2002 from the Indian states are robust to alternative specifications, clustering of standard errors as well as Hausman test for exogeneity of the potentially endogenous variables. These results suggest that the presence of the capitalist elite is associated with higher education spending when the underlying poverty rate is high, while the landed elite tend to be unresponsive to the

underlying poverty rate in the sample states. While the landed elite are never responsive to the underlying poverty rate even in the allocation of total development spending, their presence *per se* is associated with higher development spending. Also, the beneficial role of capitalist elite in responding to poverty persists even in the allocation of total development spending. Presence of both capitalist and landed elite is, however, associated with higher non-developmental spending. This exercise confirms that the real difference in the pattern of spending of the two types of elite is encapsulated with regard to educational spending. After controlling for the presence of the dominant elite, the minority elite fails to have any statistically significant impact on any category of public spending that we consider.

Unlike much of the previous literature, our analysis highlights the lack of power-sharing between different groups of elite. Results of this paper thus emphasize that ensuring political representation of the marginalized people (women and low castes) by itself may not be sufficient to erode their initial disadvantages. Any efforts to ensure a balanced distribution of power would  not only necessitate further land reform but also establishment of supporting legal and judicial institutions.

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**Table 1. Characterisation of economic elite dominance, 1960-2002**

| State | Literacy rates (%) | | Capitalist elite | | Landed elite | Minority elite[2] % MLAs in ruling govt. | | |
|---|---|---|---|---|---|---|---|---|
| | 1991 | 2001 | %Share of mfg output | Listed firms affiliated to BG[1] | %Land held by Top 5% popn | Women | SC/ST | Poverty HCR(%) |
| AP | 44.10 | 61.1 | 5.7 | 20 (43) | 41.4 | 4.69 | 21.45 | 40.61 |
| Assam | 52.90 | 64.3 | 7.1 | 1 (3) | 25.6 | 3.91 | 22.78 | 35.35 |
| Bihar | 38.50 | 47.5 | 7.4 | 1 (2) | 34.6 | 4.47 | 21.97 | 54.40 |
| Gujarat | 61.30 | 70.0 | 16.7 | 26 (66) | 31.7 | 5.47 | 31.28 | 43.40 |
| Haryana | 55.80 | 68.6 | 10.6 | 10 (28) | - | 6.40 | 23.20 | 27.02 |
| J&K | - | 54.5 | 1.8 | 0 (0) | 21.5 | 1.79 | 3.74 | 25.19 |
| Karnataka | 56.00 | 67.0 | 9.2 | 6 (24) | 32.8 | 5.08 | 20.80 | 44.05 |
| Kerala | 89.80 | 90.9 | 7.1 | 3 (9) | 42.3 | 2.99 | 7.50 | 48.28 |
| MP | 44.20 | 64.1 | 5.8 | 3 (8) | 29.7 | 6.88 | 45.04 | 47.80 |
| Maharastra | 64.90 | 77.3 | 19.1 | 94 (258) | 33.2 | 5.11 | 16.10 | 48.76 |
| Orissa | 49.10 | 63.6 | 5.5 | 2 (2) | 31.3 | 5.29 | 44.41 | 52.32 |
| Punjab | 58.50 | 69.9 | 6.4 | 10 (11) | 37.1 | 5.31 | 24.08 | 23.30 |
| Rajasthan | 38.60 | 61.0 | 4.7 | 8 (16) | 33.3 | 6.35 | 34.75 | 41.57 |
| Tamil Nadu | 62.70 | 73.5 | 13.8 | 37 (81) | 39.6 | 5.93 | 23.66 | 45.87 |
| UP | 41.60 | 57.4 | 6.0 | 11 (22) | 29.8 | 5.81 | 24.14 | 44.01 |
| West Bengal | 57.70 | 69.2 | 11.2 | 12 (40) | 31.6 | 4.86 | 28.79 | 38.75 |

Note: Share of manufacturing in state domestic product is used as a measure of capitalist elite while % of land held by top 5% of the population is a measure of capitalist elite. States with higher Gini in land distribution is also a measure of dominance of landed elite while the composite index of land reform legislation is a complement of dominance of landed elite. In particular, states with more land reform legislations are likely to have more harmonious class relationships.
[1] Number in the parentheses indicates the corresponding number of total non-financial listed firms in the state.
[2] Women and SC/ST members in the ruling party as percentage shares of total ruling party seats.

**Table 2. Means and Standard Deviations of Regression Variables**

|  | 1960-2002 | |
| --- | --- | --- |
| **Variable** | **Mean** | **Std.Dev.** |
| Educational expenditure as share of sdp (EDUEXPY) | 0.018 | 0.02 |
| \Development expenditure as share of sdp (DEVEXPY) | 0.055 | 0.079 |
| Non-development spending as share of sdp (NDEVEXPY) | 0.032 | 0.042 |
| Changes in educational spending CHEDU | 0.00038 | 0.015 |
| Changes in development spending CHDEV | 0.00072 | 0.053 |
| Changes in non-development spending CHNDEV | 0.0009 | 0.029 |
| Proportion of land held by the top 5% of the population (TOP5) | 0.3401 | 0.0564 |
| Share of registered manufacturing in net state domestic product (MFG) | 0.0867 | 0.0504 |
| Proportion of all SC/ST members in the ruling party out of all seats won by the ruling government (PSCST) | 0.2460 | 0.1379 |
| Proportion of all women in the ruling party out of seats won by the ruling government (PWOM) | 0.0503 | 0.0435 |
| Poverty HCR (HCR) | 0.4158 | 0.1616 |
| Index of ethnic heterogeneity (ETHHETY) | 0.5457 | 0.1907 |

**Table 3. FE estimates of changes in education spending (CHEDU), 1960-2002 election years data**

| VARIABLES | (1) CHEDU | (2) CHEDU | (3) CHEDU | (4) CHEDU | (5) CHEDU |
|---|---|---|---|---|---|
| Initial education spending | -0.542*** | -0.565*** | -0.607*** | -0.595*** | -0.593*** |
| | (0.170) | (0.170) | (0.183) | (0.188) | (0.188) |
| Land held by top5% (TOP5) | 0.000728 | 0.000884 | 0.000553 | 0.000374 | 0.000365 |
| | (0.000419) | (0.000577) | (0.000546) | (0.000464) | (0.000476) |
| Share of mfg regis. (MFG) | -0.206 | -0.185 | -0.118 | -0.118 | -0.120 |
| | (0.1674) | (0.1716) | (0.0831) | (0.0800) | (0.0823) |
| Poverty rate (HCR) | -0.000532** | -0.000660** | -0.000827*** | -0.000795*** | -0.000800*** |
| | (0.000220) | (0.000225) | (0.000193) | (0.000213) | (0.000235) |
| TOP5* HCR | 3.43e-06 | 1.49e-06 | 1.84e-07 | 1.75e-06 | 1.79e-06 |
| | (4.00e-06) | (5.40e-06) | (4.98e-06) | (4.46e-06) | (4.32e-06) |
| MFG*HCR | 0.00385** | 0.00394* | 0.00307* | 0.00292* | 0.00295* |
| | (0.00143) | (0.00186) | (0.00171) | (0.00156) | (0.00166) |
| SC/ST MLA | -0.0158 | -0.0144 | -0.0111 | -0.0119 | -0.0119 |
| | (0.0129) | (0.0130) | (0.0126) | (0.0124) | (0.0147) |
| Women MLA | 0.0366 | 0.0356 | 0.0378 | 0.0386 | 0.0397 |
| | (0.0285) | (0.0276) | (0.0274) | (0.0270) | (0.0312) |
| ETHHETY | -0.0121 | -0.00596 | | -0.0100 | -0.00881 |
| | (0.0100) | (0.00931) | | (0.0110) | (0.0150) |
| SC/ST Popn | | | 0.128 | 0.130 | 0.128 |
| | | | (0.0823) | (0.0800) | (0.0866) |
| Female Popn. | | | -0.318* | -0.324* | -0.558 |
| | | | (0.173) | (0.174) | (0.510) |
| Rural Popn | | 0.138 | 0.164* | 0.152* | 0.146 |

|  | (0.102) | (0.0781) | (0.0775) | (0.114) |
|---|---|---|---|---|
| TOP5_resid |  |  |  | 0.000509 |
|  |  |  |  | (0.00219) |
| MFG_resid |  |  |  | -0.0516 |
|  |  |  |  | (0.234) |
| PSCST_resid |  |  |  | -0.0247 |
|  |  |  |  | (0.279) |
| PWOM_resid |  |  |  | 0.451 |
|  |  |  |  | (1.040) |
| Intercept | Yes | Yes | Yes | Yes | Yes |
| District FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 131 | 131 | 130 | 130 | 130 |
| R-squared | 0.633 | 0.642 | 0.674 | 0.675 | 0.676 |
| Number of state | 16 | 16 | 16 | 16 | 16 |

Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$

**Table 4. FE estimates of changes in development spending** (CHDEV)

| VARIABLES | (1) CHDEV | (2) CHDEV | (3) CHDEV | (4) CHDEV | (5) CHDEV |
|---|---|---|---|---|---|
| Initial devt. Spending | -0.504*** | -0.523*** | -0.516*** | -0.539*** | -0.514*** |
| | (0.0493) | (0.0512) | (0.0815) | (0.0576) | (0.0735) |
| Land held by top5% (TOP5) | 0.00676* | 0.00720* | 0.00581* | 0.00697* | 0.00732* |
| | (0.00357) | (0.00376) | (0.00344) | (0.00377) | (0.00362) |
| Share of mfg regis. (MFG) | -0.553** | -0.442** | -0.296 | -0.232 | -0.255 |
| | (0.222) | (0.181) | (0.196) | (0.214) | (0.217) |
| Poverty rate (HCR) | -0.00287** | -0.00343** | -0.00322*** | -0.00348** | -0.00326** |
| | (0.00122) | (0.00142) | (0.00107) | (0.00125) | (0.00118) |
| TOP5* HCR | -2.80e-05 | -3.53e-05 | -2.41e-05 | -3.44e-05 | -4.23e-05 |
| | (3.70e-05) | (4.17e-05) | (3.26e-05) | (4.31e-05) | (4.62e-05) |
| MFG * HCR | 0.0156* | 0.0155* | 0.0133* | 0.0131* | 0.0129* |
| | (0.00754) | (0.00825) | (0.00642) | (0.00679) | (0.00686) |
| SC/ST MLA | 0.0617 | 0.0667 | 0.0673 | 0.0731 | 0.0775 |
| | (0.0886) | (0.0907) | (0.0864) | (0.0918) | (0.0904) |
| Women MLA | -0.0401 | -0.0408 | -0.0436 | -0.0462 | -0.0731 |
| | (0.152) | (0.145) | (0.166) | (0.165) | (0.181) |
| ETHHETY | 0.0494 | 0.0744 | | 0.0758 | 0.0739 |
| | (0.0751) | (0.0844) | | (0.0929) | (0.101) |
| SC/ST popn | | | 0.235 | 0.211 | 0.128 |
| | | | (0.191) | (0.207) | (0.203) |
| Female popn | | | -0.107 | -0.0887 | 0.451 |
| | | | (0.404) | (0.422) | (0.707) |
| Rural popn | | 0.596 | 0.553 | 0.651 | 0.493 |
| | | (0.420) | (0.328) | (0.399) | (0.384) |
| | | | | | (0.0122) |

| | | | | | |
|---|---|---|---|---|---|
| TOP5_resid | | | | | -0.00333 |
| | | | | | (0.0122) |
| MFG_resid | | | | | -0.433 |
| | | | | | (0.487) |
| PSCST_resid | | | | | -0.324 |
| | | | | | (0.771) |
| PWOM_resid | | | | | -1.193 |
| | | | | | (0.897) |
| Intercept | Yes | Yes | Yes | Yes | Yes |
| District FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 131 | 131 | 128 | 128 | 128 |
| R-squared | 0.535 | 0.548 | 0.547 | 0.553 | 0.563 |
| Number of state | 16 | 16 | 16 | 16 | 16 |

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

**Table 5. FE Estimates of changes in non-development spending** (CHNDEV)

| VARIABLES | (1) CHNDEV | (2) CHNDEV | (3) CHNDEV | (4) CHNDEV | (5) CHNDEV |
|---|---|---|---|---|---|
| Initial non-devt. Spending | -0.566*** | -0.580*** | -0.603*** | -0.610*** | -0.587*** |
|  | (0.0896) | (0.0866) | (0.126) | (0.110) | (0.135) |
| Land held by top5% (TOP5) | 0.00364* | 0.00378* | 0.00311* | 0.00330** | 0.00346** |
|  | (0.00186) | (0.00193) | (0.00168) | (0.00160) | (0.00158) |
| Share of mfg regis. (MFG) | -0.461** | -0.420** | -0.295 | -0.283 | -0.301 |
|  | (0.177) | (0.171) | (0.192) | (0.183) | (0.181) |
| Poverty rate (HCR) | -0.00130* | -0.00150* | -0.00165** | -0.00169** | -0.00157** |
|  | (0.000674) | (0.000775) | (0.000649) | (0.000727) | (0.000680) |
| TOP5*HCR | -1.48e-05 | -1.73e-05 | -1.27e-05 | -1.44e-05 | -1.93e-05 |
|  | (1.54e-05) | (1.69e-05) | (1.39e-05) | (1.73e-05) | (1.85e-05) |
| MFG*HCR | 0.0106** | 0.0106** | 0.00872* | 0.00867* | 0.00855* |
|  | (0.00437) | (0.00458) | (0.00410) | (0.00410) | (0.00411) |
| SC/ST MLA | 0.0215 | 0.0232 | 0.0245 | 0.0255 | 0.0310 |
|  | (0.0342) | (0.0355) | (0.0332) | (0.0355) | (0.0360) |
| Women MLA | -0.0511 | -0.0516 | -0.0471 | -0.0479 | -0.0599 |
|  | (0.0625) | (0.0605) | (0.0649) | (0.0666) | (0.0725) |
| ETHHETY | 0.00426 | 0.0130 |  | 0.0133 | 0.0155 |
|  | (0.0293) | (0.0314) |  | (0.0353) | (0.0445) |
| SC/ST popn |  |  | 0.128 | 0.124 | 0.0754 |
|  |  |  | (0.136) | (0.142) | (0.145) |
| Female popn |  |  | -0.202 | -0.198 | 0.0560 |
|  |  |  | (0.202) | (0.207) | (0.408) |
| Rural popn |  | 0.213 | 0.230 | 0.247 | 0.157 |

| | | | | | |
|---|---|---|---|---|---|
| | (0.222) | (0.175) | (0.196) | (0.210) | |
| TOP5_resid | | | | 0.00129 | |
| | | | | (0.00547) | |
| MFG_resid | | | | -0.324 | |
| | | | | (0.250) | |
| PSCST_resid | | | | -0.0605 | |
| | | | | (0.373) | |
| PWOM_resid | | | | -0.638 | |
| | | | | (0.690) | |
| Intercept | Yes | Yes | Yes | Yes | Yes |
| District FE | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 131 | 131 | 128 | 128 | 128 |
| R-squared | 0.646 | 0.652 | 0.659 | 0.660 | 0.671 |
| Number of state | 16 | 16 | 16 | 16 | 16 |

Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$

**Table 6. Wald statistic for joint test of significance**

| | Wald F statistic (p-value) | | |
|---|---|---|---|
| | CHEDU | CHDEV | CHNDEV |
| TOP5 = MFG | 0.91 | 1.45 | 1.47 |
| | (0.42) | (0.26) | (0.26) |
| PSCST = PWOM | 0.79 | 0.32 | 0.38 |
| | (0.47) | (0.58) | (0.69) |
| TOP5 = PSCST = PWOM | 0.93 | 0.86 | 0.63 |
| | (0.45) | (0.48) | (0.61) |
| MFG = PSCST = PWOM | 0.75 | 0.87 | 1.04 |
| | (0.54) | (0.48) | (0.40) |
| TOP5 = MFG = PSCST = PWOM | 0.72 | 0.84 | 0.79 |
| | (0.59) | (0.52) | (0.55) |

**Table 7. FE estimates of changes in public spending using annual data**

| VARIABLES | (1) CHEDU | (2) CHDEV | (3) CHNDEV |
|---|---|---|---|
| Initial Edu. spending | 0.0262* | | |
| | (0.0152) | | |
| Initial Dev. spending | | 0.155*** | |
| | | (0.0250) | |
| Initial Non-dev. Spend | | | 0.211*** |
| | | | (0.0376) |
| TOP5 | 4.50e-06 | -1.18e-05 | -5.53e-05** |
| | (3.23e-06) | (1.78e-05) | (2.25e-05) |
| MFG. | 0.000295 | 0.000145 | -3.42e-05 |
| | (0.000293) | (0.00163) | (0.00208) |
| HCR | 1.62e-06 | -6.81e-06 | -1.92e-05*** |
| | (1.01e-06) | (5.72e-06) | (7.17e-06) |
| TOP5*HCR | -4.68e-08 | 1.07e-07 | 4.75e-07** |
| | (2.87e-08) | (1.62e-07) | (2.04e-07) |
| MFG*HCR | -1.94e-06 | 1.01e-05 | 7.48e-06 |
| | (3.54e-06) | (1.97e-05) | (2.51e-05) |
| SC/ST MLA | 3.17e-05 | 6.46e-05 | 3.01e-05 |
| | (2.31e-05) | (0.000129) | (0.000163) |
| Women MLA | -9.60e-05 | -0.000394 | -0.000412 |
| | (5.92e-05) | (0.000294) | (0.000370) |
| ETHHETY | -2.64e-05*** | -0.000202*** | -0.000221*** |
| | (8.71e-06) | (4.97e-05) | (5.84e-05) |
| Intercept | -0.000174 | 0.000514 | 0.00203*** |
| | (0.000108) | (0.000599) | (0.000753) |
| Observations | 412 | 420 | 419 |
| R-squared | 0.050 | 0.099 | 0.100 |
| Number of state | 15 | 15 | 15 |

Robust standard errors in parentheses; *** $p<0.01$, ** $p<0.05$, * $p<0.1$

**Figure 1. Non-parametric Kernel Fit for Selected States**

Kernel Fit (Epanechnikov, h = 0.0022)

Haryana

Change in education spending

Land held by top 5%

Kernel Fit (Epanechnikov, h = 0.0119)

Haryana

Change in education spending

Share of manufacturing

Kernel Fit (Epanechnikov, h = 0.0034)

Maharashtra

Change in education spending

Land held by top 5%

Kernel Fit (Epanechnikov, h = 0.0087)

Maharashtra

Change in education spending

Share of manufacturing

Kernel Fit (Epanechnikov, h = 0.0024)

West Bengal

Change in education spending

Land held by top 5%

Kernel Fit (Epanechnikov, h = 0.0089)

West Bengal

Change in education spending

Share of manufacturing

**Appendix: Data Preparation**

| Variable | Source |
|---|---|
| (1) Education spending as share of state domestic product | Ozler, Dutt and Ravallion, 1996; RBI website |
| (2) Net state domestic product from registered manufacturing (as share of total net state domestic product) | Besley and Burgess 2000; RBI website |
| (3) Poverty head count ratio | Ozler, Dutta and Ravallion, 1996; NSS 93-94, 99-00 |
| (4) Share of Hindu, SC, ST, Muslim, Christians, Jains, Buddhists, Sikhs in total population; we use this population proportion $(s_i)$ to calculate ethnic heterogeneity as $1 - \sum(s_i)^2$ | Besley and Burgess, 2000, Census 2001 |
| (5) Land held by top 5% of the population | Besley and Burgess, 2000, own calculation using NSS data 93-94 and 99-00 |
| (6) Party of the Chief Minister | Besley and Burgess, 2000, own calculation using Election Commission of India website |
| (7) Winning SC/ST and woman candidate(s) in each state | Butler, Lahiri and Roy, 1996; own calculation using Election Commission of India website |