

# Voting for Development? Ruling Coalitions and Literacy in India<sup>☆</sup>

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## Abstract

Across the world, governments skew the distribution of state resources for political gain. This affects the distribution of goods that are easy to target and to claim credit for, and that can be changed in the short-run. But to what extent does politicization affect slow-moving development outcomes that are harder to target and claim credit for, particularly in the long run? Using a close-election instrumental variable design and drawing on a new socio-economic dataset of India's state assembly constituencies in 1971 and 2001, we examine whether areas represented by members of state ruling coalitions experienced greater increases in literacy over 30 years. We find that constituencies that voted for ruling coalition members did not experience greater increases in literacy in the long run. The null effect is precisely estimated.

*Keywords:* Elections, Clientelism, Political economy, Development, Education

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Politicians in democracies face electoral incentives to asymmetrically distribute state resources for political gain. Evidence from across the world has found that areas or groups that support ruling parties tend to be rewarded with government largesse, particularly with goods that are easy to target and to observe such as direct cash transfers (e.g. Boex and Martinez-Vazquez, 2005; Ansolabehere and Snyder, 2006; Tavits, 2009; Khemani, 2010a; Brollo and Nannicini, 2012; Kramon and Posner, 2013). But does the partisan distribution of resources also affect less visible and slow-moving development outcomes, such as health and education? And do such partisan benefits significantly affect development patterns in the long run?

Endogeneity concerns and data scarcity have made it difficult to study the effects of political power on long-term development outcomes. The endogeneity problem stems from the fact that under conditions of at least some retrospective voting, development outcomes will affect political outcomes in addition to political outcomes affecting development patterns. This circularity makes it difficult to recover the causal effect of political power on development. This problem is compounded by a host of data challenges, including that data are often of poor quality and ill-suited for analysis (Jerven, 2013), that states collect development data for administrative units that often do not match political units (Bhavnani and Jensenius, 2014), and that the borders of both administrative and political units change over time making it hard to examine the associations between elections and development.

We address these challenges in the context of India, by examining whether state-level electoral districts (referred to as assembly constituencies or ACs) whose representatives are in the state-level governing coalition experience greater improvements in literacy over 30 years. To do so, we build a new dataset of literacy and demographic variables for the more than 3,000 state assembly constituencies in India's 15 largest states in 1971 and 2001.<sup>1</sup> To our knowledge, this is the first dataset on development outcomes at the AC level in India. We merge these data with electoral returns data for each constituency, as well as with data on state-level governing coalitions. This dataset allows us to examine the effects of political alignment on development patterns over 30 years. Our constituency-level analysis enables

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<sup>1</sup>These data are supplemented with data on a broader array of development outcomes for the period 1991 to 2001.

us to hold a number of institutional and cultural factors constant, and yields the statistical power with which to detect even small effects of politics on literacy.

To address the possibility of reverse causality we use a close-election instrumental variable design, which leverages the fact that in India, winning or losing in close elections is quasi-random (see Eggers et al., 2013).<sup>2</sup> We use the proportion of time that a constituency was won by a member of the ruling coalition *in close elections* as an instrument for the total proportion of time the constituency was won by members of the ruling coalition. This is a strong instrument that allows us to study the causal impact of being politically represented by members of the ruling coalition in the state, while addressing the possibility of reverse causality. A similar but not identical research design has been previously used by Rehavi (2007) and Clots-Figueras (2012).

India is an important case for studying links between political power and development. The country is home to about a third of the world’s poor, political campaigns in India usually focus on development issues, and there is at least some degree of political responsiveness to public demands (Sen, 1999; Besley and Burgess, 2002). Further, the distribution of several types of state resources in India have been found to be deeply politicized. Scholars characterize Indian politics as riddled with patron-client relations, favoritism, vote- and turnout-buying, patronage, pork-barrel politics and corruption (Chandra, 2004; Wilkinson, 2006; Banks, 2011; Witsoe, 2012; Bussell, 2012). As an extreme case of the politicization of resource distribution, India is a context where we could expect the politicized distribution of government largesse to affect even long-term development outcomes such as education and health.<sup>3</sup>

We employ literacy as our outcome variable since it is widely recognized as a key component of development (it is, along with GDP per capita and life expectancy, a component

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<sup>2</sup>Note that Eggers et al 2013 show that the results of India’s close elections are quasi-random, despite the concerns raised by Grimmer et al. (2011) and Caughey and Sekhon (2011) that close elections in the USA can not be considered quasi-random.

<sup>3</sup>Several studies of India have found that states with governments aligned with the central government receive more fiscal transfers (Khemani, 2003; Rodden and Wilkinson, 2004; Bhavnani and Lacina, 2016), but to our knowledge, no previous study has examined whether partisan alignment of resources affects development outcomes at the electoral district level. The study most closely related to ours is Banerjee and Somanathan (2007), which we discuss in some detail in the next section.

of the UN Human Development Index); because changes in the census literacy variables in India are highly correlated with changes in the provision of other public goods like electricity, roads and water (Banerjee and Somanathan, 2007); and because this is the most reliable development indicator for which it is possible to get data going back several decades. Importantly for our research design, state governments have the power to affect variation in literacy in India, and state-level politicians have the power to geographically target resources for building schools, hiring teachers, and implementing education schemes. Ideally, we might examine the effects of being represented by the ruling coalition on a broader array of development indicators, as the politicization of resource distribution may be present for some types of goods and not others (Kramon and Posner, 2013), but this type of information is not available at a disaggregated level in India over time. The examination of *constituency-level* changes in literacy between 1971 and 2001 is itself a contribution to existing literature. That said, our results are robust to the use of the alternative dependent variables that are available for a shorter span of time.

Despite remarkable overall increases in literacy in India between 1971 and 2001, our analysis shows that electing state-level politicians from ruling coalitions does not increase constituency-level literacy rates. The null result is precisely estimated, and is consistent across OLS and 2SLS specifications and several robustness checks. We explore various explanations for this result, specifically whether literacy is politicized in particular constituencies (those represented by the Indian National Congress, party strongholds, governments in specific states, or those subjected to high media scrutiny); whether governments do invest in schools, but that this fails to translate into improved literacy; and lastly, whether strong bureaucracies prevent the politicization of literacy. The data are inconsistent with these explanations. While some government resources might be strategically allocated by politicians in India, the variation in the improvement in literacy that India experienced in the decades since 1971 is not influenced by whether political representatives were part of state ruling coalitions.

Whether areas benefit from supporting winning parties is of both academic and practical interest. Pork barreling, clientelism and corruption receive considerable attention in academic writing, policy debates, and the media, sometimes to the extent that one is led to

believe that no positive development takes place at all. To better understand how, and the extent to which, such practices affect people's lives, we believe it is important to analyze their impact on long-term development outcomes. The analysis we present shows that there has been a dramatic improvement in literacy rates across India in recent decades, but that this overall pattern of development has not been affected by having political representatives in state ruling coalitions. This suggests that the overall impact of the politicization of resources on people's lives might have been exaggerated.

The paper proceed as follows. In section 1, we discuss our theoretical expectations. We then introduce our empirical strategy and data in section 2. Section 3 presents the results of our empirical analysis, associated robustness checks, and explores mechanisms. Section 4 concludes.

## **1. Context and expectations**

A central concern in the study of political economy is how, and under what circumstances, politicians use state resources strategically for political gain. The theoretical literature on distributive politics has focused on understanding who (voters versus non-voters, core versus swing voters, voters with different identities, etc.) politicians should logically be trying to court in order to be reelected (see Lindbeck and Weibull, 1987; Dixit and Londregan, 1996; Besley and Coate, 1997; Osborne and Slivinski, 1996, and others). Consistent with these works, the empirical literature has found considerable evidence that governments across the world use fiscal transfers and easily targetable government programs to strategically channel resources for political gain (e.g. Boex and Martinez-Vazquez, 2005; Ansolabehere and Snyder, 2006; Tavits, 2009; Khemani, 2010a; Brollo and Nannicini, 2012; Kramon and Posner, 2013; Dahlberg and Johansson, 2002; Schady, 2000).

Building on this, a growing literature has shown that that the strategic choices of politicians are conditional on the type of electoral incentives they face and the type of goods they distribute. Electoral incentives are important since they determine the extent to which politicians feel they need to hand out benefits to gain re-election. Several studies have shown that the redistribution of resources is more likely to be politically driven in countries with single-member districts, presidential systems, and other features of the electoral systems

that incentivize the cultivation of personal votes (Shugart, 1999; Lancaster and Patterson, 1990; Scheiner, 2005; Crisp et al., 2004; Ashworth and Mesquita, 2006). Evidence from India shows that the efforts of politicians also depend on the level of competition they face in their constituency (Keefer and Khemani, 2009) and on their time horizons (Nath, 2016).

But politician efforts also differ across types of goods (Kramon and Posner, 2013; Auerbach and Sinha, 2013). This could be because of variation in politicians' ability to manipulate and target goods in different contexts as well as differences in their ability to claim credit for their efforts. Mani and Mukand (2007) refers to the latter as the "visibility effect" and shows that the low visibility of several public goods causes their underprovision. Education, they argue, falls within the category of a low visibility good, because even though the degree of literacy in a population may be easy to observe, this outcome depends upon a number of factors other than government efforts or competence. In line with this argument, Harding and Stasavage (2014) show that in several African countries democratization is associated with a reduction in school fees (a more visible education-related good) but not with other education efforts.

Does political alignment affect long-run socio-economic outcomes in India, a country where there is a wide-spread belief that most types of state resources are manipulated by politicians and civil servants? India is also often referred to as a "patronage democracy," where "the state has a relative monopoly on jobs and services, and in which elected officials enjoy significant discretion in the implementation of laws allocating the jobs and services at the disposal of the state" (Chandra, 2007, p. 86). The country is federal, and at the center there is a Union government headed by the Prime Minister, who is the leader of the party or coalition of parties with a legislative majority. Moreover, each state is governed by its own Chief Minister (the Indian equivalent of US governors), who similarly commands the majority party or coalition in the state legislature. With single-member districts, Chief Ministers that have president-like powers, and weak parties and fluid links between parties and candidates (Chhibber et al., 2014), there are several institutional incentives to cultivate a personal vote. Chief Ministers and their coalitions have considerable *de jure* and *de facto* influence over how resources are allocated and distributed in their states. With coalition governments becoming increasingly common, the negotiations required for creating and maintaining parliamentary

majorities have provided fertile ground for both horse-trading and pork-barrel politics.

Several studies have found evidence of a politicized distribution of government largesse in India. Khemani (2003) as well as Rodden and Wilkinson (2004) show that India's central government distributes more resources to states with governments that are politically aligned with the center. Asher and Novosad (forthcoming) find that areas with MLAs aligned to the ruling state government attract more private sector jobs. Chhibber and Jensenius (2016) show that most members of parliament spend consistently more of their discretionary funds in villages where they gain a solid electoral majority. There is also evidence that village-level politicians use their power to distribute resources to supporters of their party (Dunning and Nilekani, 2013; Jha et al., 2009).

While these studies find evidence of the politicized distribution of easily targetable goods with fairly high visibility, much less is known about the political bias in the distribution of resources for slow-moving development outcomes like education and health, and particularly the long-term trends in their distribution. Yet, these types of outcomes are crucial to the quality of life of ordinary people. Surveys have shown that members of disadvantaged groups see education as offering the most promising chance for a better life for their children (Dreze and Sen, 1995). There are several reasons why we might expect to see such resources being politicized.

First, a large share of government funds goes to education. According to Khemani (2010b, p. 37), 21% of India's state budgets between 1980 and 2005 were allocated for education. During 1971–2001, state resources played a critical role in increasing literacy rates. At the start of the period the literacy rate was 29%. This was to a large part due to the dearth of schools. In the three decades since the 1970s, massive efforts were made to construct new schools as well as to train and hire teachers, with the constant pressure of a growing demand due to a rapidly growing population. As a result, literacy increased with an average of 25 percentage points between 1971 and 2001.<sup>4</sup>

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<sup>4</sup>In recent years, a vibrant literature has emerged about the prevalence of teacher absenteeism in India and how this prevents a further growth in literacy despite the fact that most regions now have schools and teachers on paper (see Kremer et al., 2005; Banerjee et al., 2010). Recent studies on providing more resources and information to improve school attendance and literacy have also showed limited results (Banerjee et al., 2000; Glewwe et al., 2004; Banerjee et al., 2010). However, during the years we look at it was the construction

Second, recent research suggests that teachers in India often are closely tied to politicians, and that providing more jobs as teachers is a key way to try to gain and reward electoral support (Chhibber and Nooruddin, 2004; Beteille, 2009).

And third, it is commonly believed that individual politicians have considerable influence over resource allocation to their constituencies, and that being in power in the state is critical to affecting the distribution of all types of resources. In one-on-one interviews, several Indian Members of Legislative Assemblies (MLAs) stated that they felt powerless when they were in opposition and that there would be no development in their constituency until their party was back in power.<sup>5</sup> One experienced MLA in India's largest state Uttar Pradesh argued that being in power was essential for getting anything done in his constituency, that when his party had been in power they failed to listen to the opposition, and now (February 2011) the party in power did not listen to members of his party.<sup>6</sup> Similarly, a senior party official of the Samajwadi Party said that members of the opposition never get anything done because the bureaucracy does not listen to them, for fear of being transferred by the ruling coalition to a less attractive posting.<sup>7</sup>

However, there are also reasons to believe that the targeted distribution of resources is limited. First, there is the question of electoral incentives. As already suggested, easily-targeted monetary transfers might plausibly yield greater electoral benefits than less easily-targeted investments in slow-moving outcomes such as education and health. Consistent with this possibility, in interviews with civil servants across India, we found that politicians sought to pressure some civil servants more than others. Specifically, civil servants working on programmatic development projects, such as primary education, seemed to have little contact with politicians and be exposed to little political pressure. This observation aligns well with the findings in Khemani (2010b)—that politicians try to manipulate funds for

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of schools that was the main priority for improving education.

<sup>5</sup>The authors conducted interviews with high-level civil servants, MPs, MLAs, and village-level politicians on multiple field trips across India between 2009 and 2012. The bulk of the interviews were conducted in the Northern states of Himachal Pradesh and Uttar Pradesh.

<sup>6</sup>Interview by Jensenius, February 2011.

<sup>7</sup>Interview by Jensenius, November 2010. Indian civil servants have strong job security, but threats of transfers to undesirable locations and positions are frequently cited as a way in which politicians try to influence them.



employment and welfare transfers for winning votes for re-election, while they prefer using resources for infrastructural projects for rent-seeking, rather than political targeting. Also consistent with the lack of interest on the part of politicians in influencing literacy rates is the claim by a civil servant in a Chief Minister's office, that most of the communication between individual politicians and the Chief Minister's office was about trying to help people getting better job postings.<sup>8</sup>

Second, evidence suggests that the electoral gains from slow-moving goods accrue to politicians upon the *announcement* of big projects rather than from their implementation. For example, Wilkinson (2006) describes how central funds for infrastructure projects are used strategically to gain political support at the time of elections, but that many of these announced projects are not properly implemented afterward.

Third, as much as people talk of the arbitrary nature of the political system, India has a large and a comparatively well-functioning bureaucracy that implements development projects (Potter, 1986). While bureaucrats are often accused of being corrupt and inefficient, the higher bureaucracy is thought to be staffed by intelligent and hard-working bureaucrats, who could potentially insulate developmental projects from political meddling.

Finally, India has been a well-functioning democracy for decades and as such it might be unacceptable to implement blatantly politicized and unfair development plans. Whatever political influence occurs is likely to be marginal, and is unlikely to have major effects on people's lives. Consistent with this account, Burgess et al. (2013) find that the ethnic favoritism in Kenya's road building program is restricted to periods of autocratic rule. They conclude that democracy, however imperfect, works to constrain the political leadership from blatant favoritism. The same might be true in India.

We have just presented anecdotal evidence suggesting that we might see long-term effects of the politicization of the distribution of development resources in India, but also several arguments for why we do not expect to see such effects on a large scale. Data scarcity and issues of endogeneity have made it hard to establish whether such systematic patterns exist. In the study that most closely relates to ours, Banerjee and Somanathan (2007) find no evidence of

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<sup>8</sup>Interview by Jensenius, 2010. State and date omitted to avoid identification.

ethnic or religious targeting of resources at the parliamentary-constituency level, but rather that socio-economic outcomes across parliamentary constituencies converged between 1971 and 1991. However, this study did not test for the possible effects of electing members of the ruling coalition. Using a fine-grained dataset (more than 3,000 state assembly constituencies as compared with 499 parliamentary constituencies in Banerjee and Somanathan 2007), and an empirical strategy to explicitly rule out reverse causality, we show that electing members of the ruling coalition has not improved constituencies’ socio-economic outcomes.

To put this finding to a further test, we also search for evidence for the politicization of the literacy rate of scheduled castes (SCs). SCs—also known as *dalits* or former “untouchables”—are a particularly disadvantaged minority in India. They form approximately 16% of the country’s population and are generally poorer and less literate than others. Ruling coalitions in India have been particularly committed to improving the literacy rates of SCs (Banerjee and Somanathan, 2007; Jaffrelot, 2003; Jaffrelot and Kumar, 2009), and SCs have seen greater improvements in literacy than the rest of the population (in the constituencies that we study, the overall literacy rate increased by about 25 percentage points between 1971 and 2001, while the SC literacy rate increased by 31 percentage points). Since political parties have made special efforts to raise the living standards for SCs, and the increase in their literacy and other socio-economic indicators has been more rapid than among the rest of the population, we may be more likely to observe a pattern of asymmetric distribution of resources by looking at the SC community in particular.<sup>9</sup>

## 2. Empirical strategy and data

In this paper we investigate whether having political representatives in the state ruling coalition affected the change in literacy in state assembly constituencies across India in the three decades from 1971. A naïve model of this relationship could be estimated with OLS regressions of the following form:

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<sup>9</sup>Using the same census data as in this paper, Jensenius (2015) used a matching estimator based on 1971 data and found no difference in the development for SCs in areas controlled by SC politicians and other areas: i.e. there is therefore no evidence of an ethnically-based bias driving these development patterns.

$$L_{i,2001} = \alpha + \delta L_{i,1971} + \beta P_i + \gamma \mathbf{x}_{i,1971} + \epsilon_i \quad (1)$$

where the literacy rate ( $L$ ) of constituency  $i$  in 2001 is modeled as a function of the literacy rate in 1971, and the proportion of time ( $P$ ) between 1971 and 2001 the constituency was represented by an MLA in the ruling coalition, and  $\mathbf{x}$  is a vector of observable pre-treatment confounders from 1971.

The key challenge to obtaining an unbiased causal estimate of the effect of political power on literacy ( $\beta$ ) is that the election of member of the ruling coalition endogenous to the performance in different politicians in office, and therefore to the dependent variable. Thus, changes in literacy might affect who gets voted into the ruling coalition. If this is the case, our estimate of  $\beta$  would be biased.

To account for this, we take advantage of the fact that the selection of some MLAs into the ruling coalition occurred quasi-randomly, in close elections. In close elections, constituencies are arguably *as if randomly* assigned to one politician or another (see Lee, 2008). While there is an ongoing discussion about whether this design is valid in the study of US elections (Grimmer et al., 2011; Caughey and Sekhon, 2011), studies of Indian data have provided evidence that elections with a smaller margin of victory than 5% can be interpreted as close to randomly assigned to one of the competing political candidates (Uppal, 2009; Eggers et al., 2013). Building on this result, we instrument the proportion of times an MLA was in the ruling coalition with the proportion of close elections between candidates from the ruling coalition and the opposition that were won by the candidate from the ruling coalition. Given that the outcome of each of these close elections is determined by something close to an independent, random draw, the average across these close elections can also be considered random. A similar but not identical research design has previously been used to instrument for the proportion of female MLAs in India’s administrative districts (Rehavi, 2007; Clots-Figueras, 2012).

Our first-stage regression instruments for the proportion of time that a constituency was represented by a member of the ruling coalition ( $P_i$ ) by estimating the following equation:

$$P_i = \phi + \pi L_{i,1971} + \zeta I_i + \eta \mathbf{x}_{i,1971} + \vartheta_i \quad (2)$$

where  $I_i$ , the instrument, is the proportion of close elections between ruling coalition and opposition candidates won by members of the ruling coalition. Since  $I_i$  is a component of  $P_i$ , it is mechanically correlated with  $P_i$ . The exclusion restriction for  $I_i$  is satisfied by the fact that it probably only affects literacy through  $P_i$ .

Although the outcomes of the close elections in each constituency are *as if* random, whether a constituency has one or more close elections is not random. The vector of controls,  $\mathbf{x}$ , therefore includes controls for the proportion of close elections in constituencies, along with other observable confounders. Following Clots-Figueras (2012), we define an election as close if it had a margin of victory of less than 3.5%.<sup>10</sup> We also include first-, second-, and third-order polynomial controls for the size of the winning vote margin in the close elections in each constituency.

To implement this empirical strategy, we draw on state election data from Bhavnani (2014). We supplement this with data on government formation from Bhavnani (forthcoming), as extended by us (see Online Appendix for details). These data allow us to construct our key independent variable of interest—the proportion of time that a constituency’s representative was in the ruling coalition—and also to code the proportion of time that a constituency’s representative was a minister, as well as the effective number of parties and turnout across constituencies. All of these variables are calculated as averages for 1977-2001, since state constituency boundaries were fixed during this period. These, and other key variables, are summarized in Table 1. As we can see in the table, some constituencies had an MLA from the ruling coalition throughout the period under study, while others never had an MLA from the ruling coalition. On average, a constituency had an MLA from the ruling coalition 65% of the time.<sup>11</sup>

To study slow-moving socio-economic development across Indian constituencies, we focus on the change in literacy rates between 1971 and 2001.<sup>12</sup> Note that although our unit of

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<sup>10</sup>As reported below, our results are robust to redefining close elections as those with margins of victory of less than 1% and 5%.

<sup>11</sup>Similarly, some constituencies had an MLA in the state cabinet, as a minister, throughout the period, but the average constituency had an MLA in the state cabinet 11% of the time.

<sup>12</sup>We do not use 1981 census data here, as we wish to focus on the long term, and the 1971 census data enable us to examine changes in literacy over 30 years. Also, the definitions of several variables in the 1981 census were different from those employed in other years (Banerjee and Somanathan, 2007).

analysis is India’s state-level political constituencies, the authorities do not collect literacy data for these units. The census instead releases literacy data for the country’s blocks (also called tehsils, taluks, mandals, firkas, police stations or development blocks), which can be mapped onto the political constituencies. We conducted this exercise manually for the 1971 data and with the help of GIS maps for 2001 (Bhavnani and Jensenius, 2014). For robustness tests and an examination of mechanisms, we also conducted this exercise for 1991 (see Online Appendix for details). This yields estimates of the literacy rates and the demographics of approximately 3,000 state assembly constituencies in 1971 and 2001.

The resulting constituency-level estimates of census variables are summarized in Table 1. As suggested earlier, the data show that the country experienced a massive increase in literacy 1971 and 2001, from 29% to 54%. Literacy rates for SCs started off at 16% in 1971 and increased to 47% in 2001. Thus, although SCs still lagged behind the rest of the population in 2001, the gap had narrowed substantially during this period.<sup>13</sup> Figure 1 shows state-wise box plots of the constituency-level change in literacy between 1971 and 2001. Here we see that although the average growth in literacy was high across all states, there was considerable variation within states, with some constituencies experiencing almost no increase and others a very high increase. We examine the degree to which this variation may be explained by the experience of political power.

### 3. Findings

Figure 2 plots the bivariate relationship between the proportion of time between 1977 and 2001 that constituencies were represented by members of the ruling coalition and change in overall and SC literacy rates across India’s constituencies between 1971 and 2001. The figures suggest that voting for the winning coalition is associated with improvements in

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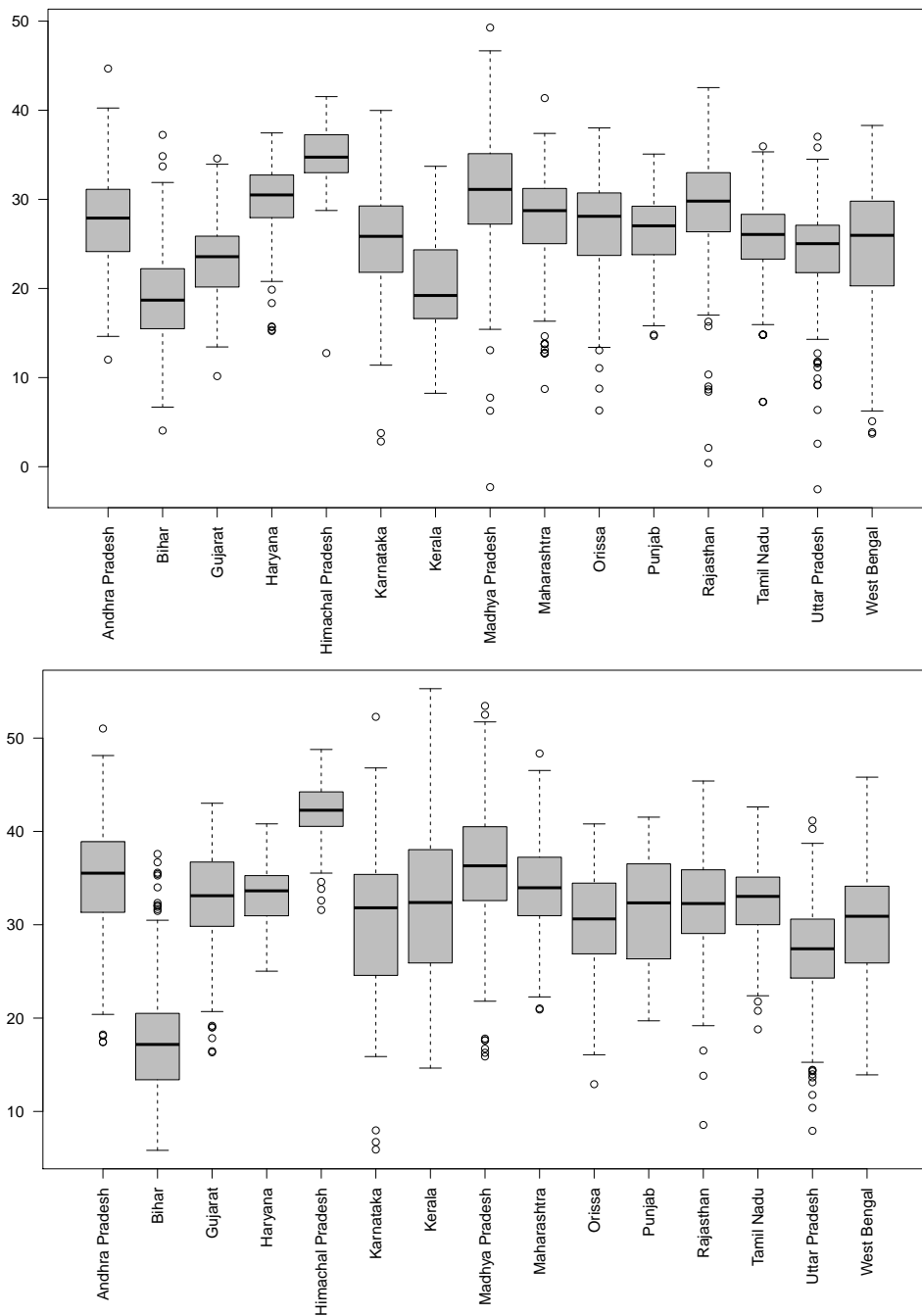
<sup>13</sup>In 1971, the number of literates in the Indian census were counted out of people who were five years of age or older. The official literacy rate published from the census therefore used the population that was five years and older as the denominator. In 2001, this was changed to seven years and older, and the official literacy rate used the population recorded as seven years and older as the denominator. Lacking data for the proportion of the population that was five years and above in our 1971 dataset, we use the total population as the denominator for both 1971 and 2001. This is intended to make the analysis more consistent, but also means that the literacy rates we report are somewhat lower than the official ones published in 2001 census reports.

Table 1: Summary statistics

	Mean	Std. dev.	Min.	Max.
Overall literacy rate, 2001	54.25	12.92	19.53	86.75
Overall literacy rate, 1971	28.52	13.04	2.74	78.29
Scheduled caste literacy rate, 2001	47.10	14.44	11.81	82.84
Scheduled caste literacy rate, 1971	16.30	11.15	1.97	66.89
Number of primary schools, 2001	177.83	100.78	0.00	965.00
Number of primary schools, 1991	144.60	79.92	0.00	620.00
% of rural pop. with access to medical facilities, 2001	66.12	24.43	0.00	100.00
% of rural pop. with access to medical facilities, 1991	52.87	26.88	0.00	100.00
% of rural pop. with access to communication facilities, 2001	77.06	21.11	0.00	100.00
% of rural pop. with access to communication facilities, 1991	58.60	23.68	0.00	100.00
% of rural pop. with access to paved roads, 2001	80.50	21.35	0.00	100.00
% of rural pop. with access to paved roads, 1991	66.65	26.72	0.00	100.00
Prop. of time in ruling coalition	0.65	0.23	0.00	1.00
Prop. of time minister	0.11	0.15	0.00	1.00
Effective no. of parties	2.85	0.67	1.71	6.81
% turnout	60.38	10.71	24.15	85.52
Prop. of seats won by coalition members in close elections against opposition	0.07	0.11	0.00	0.67
Prop. of coalition v. opposition elections	0.80	0.19	0.00	1.00
Prop. of close coalition v. opposition elections	0.12	0.15	0.00	0.81
Vote margin in close coalition v. opposition elections	8.42	8.24	-28.75	57.50
Vote margin squared	138.84	199.37	0.00	3306.38
Vote margin cubed	2528.55	6377.32	-23766.05	190120.20
% SC, 1971	15.15	8.04	0.22	63.04
% ST, 1971	6.99	15.81	0.00	95.04
Dummy for whether constituency reserved for SCs	0.15	0.36	0.00	1.00
Dummy for whether constituency reserved for STs	0.08	0.27	0.00	1.00
Log male/female ratio, 1971	0.06	0.08	-0.29	0.66
Log no. of houses, 1971	10.11	0.27	8.20	11.59
Log households, 1971	10.21	0.30	6.76	10.88

*Notes:* Variables without years are averaged over 1971–2001.

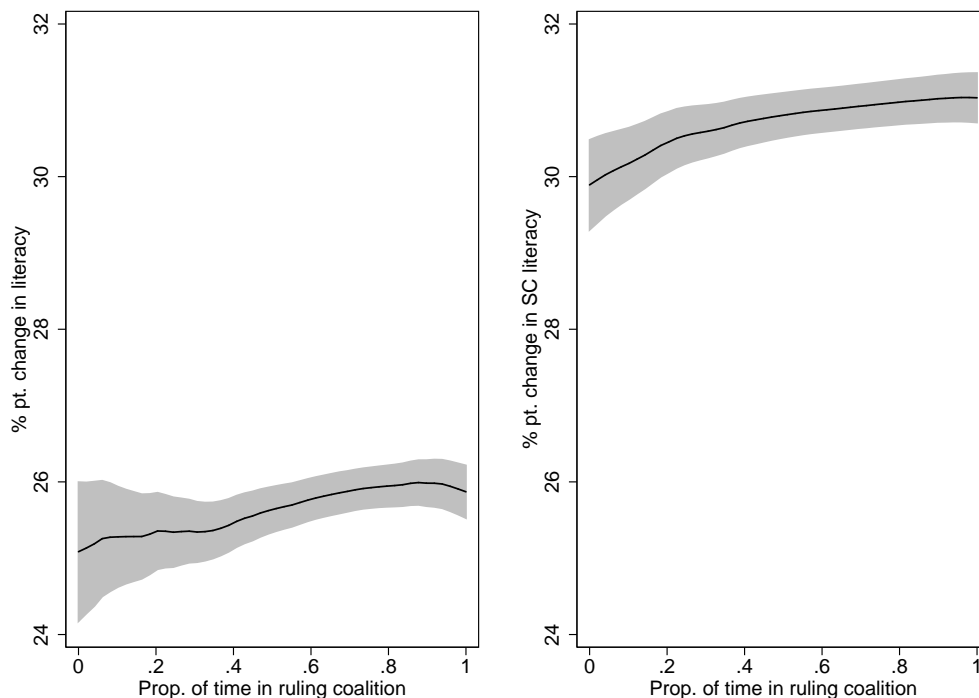
Figure 1: State-wise box plots of changes in overall (upper plot) and SC (lower plot) literacy rates at the constituency level between 1971 and 2001



Source: Authors' calculations.

literacy rates, for both the overall population and for SCs. These patterns provide some weak support for an asymmetric resource distribution, but we cannot draw strong conclusions from

Figure 2: The bivariate relationship between politics and the percentage point change in overall and SC literacy between 1971-2001



*Note:* Local polynomial smooths with 95% confidence intervals.

such bivariate plots, as we have not controlled for possible confounders, or for the possibility of reverse causality.

Table 2 presents multivariate regressions for the determinants of 2001 literacy rates, for the entire population and separately for SCs. The regressions control for the dependent variables in 1971, thereby controlling for initial conditions. In regressions 1 and 4, which implement equation 1, we control for the main independent variable of interest—the proportion of time the constituency’s representatives were in the ruling coalition. As in the bivariate plots, the proportion of time the MLAs were in the ruling coalition emerges as positively associated with the literacy rate in 2001 and the SC literacy rate in 2001. Regressions 2 and 5 additionally control for several possible confounds: constituency demographics in 1971 (the percentage of SCs and Scheduled Tribes, who are another minority that form approximately 8% of the population, and the log male/female ratio), constituency reservation status (a



dummy for whether the constituency was reserved or set aside for SCs or STs during this period),<sup>14</sup> and the log number of households in each constituency. These regressions also include district fixed effects, thereby controlling for district-invariant confounders. Standard errors are clustered at the district level. Districts are an administrative unit below the state and above the assembly constituency levels. On average there are 9.7 assembly constituencies in a district. After these adjustments, it no longer appears that electing a representative to the ruling coalition boosts the literacy rate in a constituency. For both the overall and SC literacy rate, the coefficient for the proportion of time in ruling coalitions is attenuated and is no longer statistically significant.

The multivariate OLS models that include controls for several possible confounders do not provide any evidence to the effect that constituencies benefit from having a representative from the ruling coalition. However, these results may be an artifact of endogeneity, as the performance of incumbents in office can affect vote choice. To control for this possibility, we employ the close-election instrumental variable analysis described in the previous section. In regressions 3 and 6, we instrument for the proportion of time in the ruling coalition with the proportion of close elections won by a member of the ruling coalition. Following Clots-Figueras (2012), close elections are defined as those with a vote margin less than or equal to 3.5% (as discussed below, the results are robust to alternative definitions of close elections), where an MLA who would be inducted into the ruling coalition won against someone who would not have been included in the ruling coalition. The first-stage results, reported in Table 2, indicate that the instrument is positively and statistically significantly associated with the endogenous variable. The first stage  $F$ -statistic is 1,030, well above 10, which is the conventional threshold for a strong instrument. The  $F$ -statistic is so high because the instrument is highly correlated with the endogenous regressor ( $\rho > .9$ ). To control for the fact that the proportion of close elections in a constituency might be endogenous, regressions 3 and 6 also control for this variable. In line with the normal practice in the use of a fuzzy regression discontinuity design, and following Clots-Figueras (2012), controls are also included for the proportion of coalition-versus-opposition elections, the proportion

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<sup>14</sup>This is an important control since politics is fundamentally different in these constituencies (see Jensenius, forthcoming, chapter 3).

Table 2: Determinants of overall and SC literacy rates in 2001

	% Literates						% SC literates					
	1		2		3		4		5		6	
	OLS	OLS	OLS	OLS	2SLS	2nd stage	OLS	OLS	OLS	OLS	1st stage	2nd stage
Prop. of time in ruling coalition	1.226** [0.487]	0.121 [0.402]				-0.526 [0.924]	1.764*** [0.599]		0.0416 [0.408]			-0.568 [1.001]
Initial value of DV	0.862*** [0.00871]	0.689*** [0.0291]	0.0004 [0.000550]			0.689*** [0.0275]	1.089*** [0.0125]		0.733*** [0.0541]		-3E-04 [0.000640]	0.734*** [0.0509]
Prop. of seats won by coalition members in close elections against opposition			0.930*** [0.0290]								0.932*** [0.0289]	
Prop. of coalition v. opposition elections			0.398*** [0.0211]			-0.514 [0.635]					0.397*** [0.0210]	-0.207 [0.660]
Prop. of close coalition v. opposition elections			-0.569*** [0.0227]			-0.365 [0.490]					-0.570*** [0.0226]	-0.426 [0.513]
Vote margin in close coalition v. opposition elections			0.0254*** [0.00119]			0.0344 [0.0266]					0.0254*** [0.00119]	0.0417 [0.0287]
Vote margin squared			-0.000278*** [0.000105]			-0.001 [0.00120]					-0.000277*** [0.000105]	-0.00251*** [0.000899]
Vote margin cubed			-4E-06 [0.00000338]			3E-06 [0.0000244]					-4E-06 [0.00000339]	1E-05 [0.0000197]
Controls?	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
District fixed effects?	No	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Observations	3,137	3,137	3,137	3,137	3,137	3,137	3,135	3,135	3,135	3,135	3,135	3,135
Adjusted $R$ -squared	0.76	0.92	0.75	0.92	0.75	0.92	0.71	0.71	0.93	0.75	0.93	0.93
1st stage $F$ -stat. for time in ruling coalition						1,030						1,042

Notes: Controls include the proportion of the population that was scheduled caste (SC) in 1971, the proportion of the population that was scheduled tribe (ST) in 1971, dummies for whether the constituency was reserved for SCs or STs, the log male-female ratio, and the log number of houses and households in each constituency. Standard errors in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . See text for details.

of these elections that were close, and the margin of victory (defined as the mean difference between the vote share of the winner and runner-up), its square and its cube.

The second-stage results suggest that electing representatives from the winning coalition does not boost overall or SC literacy rates. The coefficients for both overall literacy and SC literacy are, in fact, negative, but also statistically insignificant. The coefficients for the margin of victory are also statistically insignificant in the second stage of these models, suggesting that constituencies that are more competitive do not experience higher growth in literacy than other constituencies. We therefore find no evidence of constituencies benefiting from electing members of the ruling coalition, nor from being more competitive. It is important to note that our sample size of over 3,000 observations ensures that our null-finding is not driven by underpowered tests. Moreover, the 95% confidence interval for the effect of a standard deviation increase in the proportion of time a constituency is represented by the ruling coalition (0.23) on the change in overall literacy is narrow  $-0.5\%$  to  $0.3\%$ , and the 95% confidence interval for the increase in SC literacy due to alignment is a similarly narrow  $-0.6\%$  to  $0.3\%$ . The upper bounds of these confidence intervals are particularly small given that the overall and SC literacy rates respectively increased by an average of 26 and 31% in this period.

### *3.1. Robustness checks*

In this section, we show that our results are robust to examining the effects of alignment on other dependent variables, and to several alternative model specifications as well. To start with, it is possible that the null estimated effect of alignment in 1971–2001 was driven by our choice of literacy as the dependent variable. To see whether this is the case, we examine the effects of alignment between 1991 and 2001 (we use 1991 rather than 1971 data due to data limitations) on three other development outcomes: the proportion of rural residents with access to medical facilities, communication facilities and roads. The results—presented in Table 3—reconfirm (using OLS, OLS with controls, and 2SLS with controls) that alignment fails to have statistically significant effects on development outcomes.

We next examine whether the estimated non-effect of alignment on overall and SC literacy are robust to the use of alternative specifications. Table 4 presents these results with overall

Table 3: Determinants of alternative dependent variables in 2001

Dependent variables: % of rural population with access to	medical facilities			communication facilities			paved roads		
	OLS 1	OLS 2	2SLS 3	OLS 4	OLS 5	2SLS 6	OLS 7	OLS 8	2SLS 9
Estimator:									
Prop. of seats won by coalition members	-0.212 [1.388]	0.116 [0.929]	0.21 [2.027]	2.242** [1.040]	0.0145 [0.771]	-0.301 [1.645]	-4.656*** [0.995]	-1.67 [1.035]	-0.118 [1.621]
Initial value of DV	0.536*** [0.0168]	0.354*** [0.0317]	0.353*** [0.0300]	0.641*** [0.0143]	0.401*** [0.0361]	0.400*** [0.0339]	0.589*** [0.0121]	0.263*** [0.0303]	0.263*** [0.0286]
Prop. of coalition v. opposition elections			0.14 [1.674]			-0.269 [1.367]			0.233 [1.274]
Prop. of close coalition v. opposition elections			0.188 [1.184]			0.698 [0.994]			-0.204 [0.901]
Vote margin in close coalition v. opposition elections			0.0162 [0.0760]			0.00716 [0.0580]			-0.0494 [0.0670]
Vote margin squared			0.000486 [0.00239]			0.00116 [0.00290]			-0.0002 [0.00242]
Vote margin cubed			-4.1E-05 [0.0000404]			-5.4E-05 [0.0000488]			8.76E-06 [0.0000441]
Controls?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
District fixed effects?	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Observations	1947	1947	1947	1947	1947	1947	1943	1943	1943
Adjusted <i>R</i> -squared	0.35	0.81	0.81	0.51	0.83	0.82	0.56	0.82	0.82
1st stage <i>F</i> -stat. for time in ruling coalition			937			928			915

*Notes:* Controls include the proportion of the population that was scheduled caste (SC) in 1971, the proportion of the population that was scheduled tribe (ST) in 1971, dummies for whether the constituency was reserved for SCs or STs, the log male-female ratio, and the log number of houses and households in each constituency. Standard errors in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . See text for details.

literacy as the dependent variable; Table 5 presents the results with SC literacy as the dependent variable. In both tables, regression 1 examines whether our results are robust to the use of the *change* in the literacy rates between 1971 and 2001 as the dependent variable, in case the use of the lagged dependent variable as a control in the main regressions leads to Nickell bias.<sup>15</sup> Regression 2 in each of the tables includes a squared term for the proportion of time in the ruling coalition (to account for a possible non-linearity in the relationship between literacy and being included in the ruling coalition), and regression 3 calculates the time in the ruling coalition between 1977 and 1996, thereby excluding the last five years of the period, to allow for some (arbitrary) time-lag for any effects of being in power on literacy.<sup>16</sup> Our core results remain unaffected by these changes.

Regression 4 includes controls for additional pre-treatment socio-economic variables: the percentage of non-workers and agricultural laborers in each constituency in 1971. The former is positively associated with literacy, and the main results remain unchanged. In regression 5, we control for political variables: the proportion of the period when the constituency was represented by a minister, the effective number of parties in the constituency, and the percentage turnout in the constituency. Our main results are robust to these additions to the model. Interestingly, turnout emerges as strongly positively associated with growth in literacy. Although this is consistent with the possibility that political pressure leads to better provisioning of public goods, it would be incorrect to interpret this correlation in a causal manner. Endogeneity remains a concern here.

In regression 6, we substitute district fixed effects for state fixed effects (and also cluster the standard errors at the state level), in case the district fixed effects “over-control” for confounders. Again, our results remain robust to this change.

In regression 7, we employ an alternative instrument for the proportion of time in the ruling coalition: using an indicator for whether the *first* election in our political dataset was a close election between a member of the ruling coalition and opposition (rather than using

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<sup>15</sup>We prefer to use the lagged dependent variable in the main specification since, as explained, the official definitions of literacy in 1971 and 2001 differ slightly, which complicates interpreting the calculated changes in literacy between 1971 and 2001.

<sup>16</sup>Our main specifications do not account for such a lag since efforts to improve education can arguably boost literacy for near-literates quickly.

Table 4: Robustness tests for the determinants of overall literacy rates in 2001

Dependent variable:	% Literacy, '71-'01								
	≤ 3.5% 1	≤ 3.5% 2	≤ 3.5% 3	≤ 3.5% 4	≤ 3.5% 5	≤ 3.5% 6	≤ 3.5% 1st elec. 7	≤ 1% 8	≤ 5% 9
Close election definition:									
Prop. of time in ruling coalition	-1.201 [1.105]	-25.12 [30.65] 19.71 [24.51]	-0.578 [0.929]	-0.398 [0.942]	-1.721 [1.175]	1.708 [1.794]	-0.563 [0.851]	-1.559 [5.564]	
Prop. of time in ruling coalition squared									
Prop. of time in ruling coalition, until 1996			-0.507 [0.881]						
% non-workers				0.0753** [0.0354] 0.0656 [0.0478]					
% agricultural laborers									
Prop. of time minister					-0.0353 [0.524] -0.196 [0.216] 0.0857*** [0.0232]				
Effective no. of parties									
% turnout									
Initial value of DV		0.697*** [0.0287]	0.689*** [0.0275]	0.685*** [0.0310]	0.704*** [0.0264]	0.829*** [0.0537]	0.687*** [0.0274]	0.689*** [0.0275]	0.690*** [0.0281]
Prop. of coalition	-0.194 [0.685]	0.811 [1.762]	0.811 [1.762]	-0.545 [0.628]	-0.653 [0.644]	-1.655* [0.961]	-1.394 [0.867]	-0.448 [0.612]	-0.107 [2.164]
v. opposition elections	-0.531 [0.544]	-0.415 [0.530]	-0.314 [0.493]	-0.314 [0.493]	-0.384 [0.496]	-1.335** [0.570]	-0.415 [0.521]	-0.415 [0.521]	-0.415 [0.521]
Prop. of close coalition	0.0353 [0.0325]	0.132 [0.132]	0.0356 [0.0268]	0.0356 [0.0268]	0.0371 [0.0268]	0.0516 [0.0400]	-0.024 [0.0478]	0.0351 [0.0260]	0.0613 [0.144]
v. opposition elections	-0.00125 [0.00145]	-0.0079 [0.00893]	-0.00128 [0.00118]	-0.00128 [0.00118]	-0.00136 [0.00121]	-0.00265** [0.00110]	-0.000708 [0.00125]	-0.00139 [0.00119]	-0.00157 [0.00191]
Vote margin squared	5.92E-07 [0.0000295]	7.96E-05 [0.000112]	0.00000319 [0.0000240]	0.00000319 [0.0000240]	6.96E-06 [0.0000251]	3.74E-05 [0.0000270]	0.0000146 [0.0000257]	4.78E-06 [0.0000245]	-1.7E-06 [0.0000363]
Vote margin cubed									
Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State/district fixed effects?	District	District	District	District	District	State	District	District	District
Observations	3,137	3,137	3,137	3,137	3,137	3,137	3,137	3,137	3,137
Adjusted R-squared	0.64	0.92	0.92	0.92	0.92	0.85	0.92	0.92	0.92
1st stage F-stat. for time in ruling coalition	1,046	559	1,123	1,022	982	2,566	240	1,671	15

Notes: Controls include the proportion of the population that was scheduled caste (SC) in 1971, the proportion of the population that was scheduled tribe (ST) in 1971, dummies for whether the constituency was reserved for SCs or STs, the log male-female ratio, and the log number of houses and households in each constituency. Standard errors in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . See text for details.

Table 5: Robustness tests for the determinants of SC literacy rates in 2001

Dependent variable:	% SC literacy, '01								
	≤ 3.5% 1	≤ 3.5% 2	≤ 3.5% 3	≤ 3.5% 4	≤ 3.5% 5	≤ 3.5% 6	≤ 3.5% 1st elec. 7	≤ 1% 8	≤ 5% 9
Close election definition:									
Prop. of time in ruling coalition	-1.065 [1.082]	-33.19 [35.80] 26.16 [28.55]		-0.8 [1.004]	-0.588 [1.016]	-2.562** [1.203]	1.076 [1.869]	-0.268 [0.844]	-4.726 [6.530]
Prop. of time in ruling coalition squared									
Prop. of time in ruling coalition, until 1996			-0.574 [0.947]						
% non-workers				0.184*** [0.0501]					
% agricultural laborers				-0.00708 [0.0514]					
Prop. of time minister					0.763 [0.526]				
Effective no. of parties					0.284 [0.200]				
% turnout					0.0403 [0.0264]				
Initial value of DV		0.741*** [0.0541]	0.733*** [0.0508]	0.694*** [0.0529]	0.738*** [0.0512]	0.888*** [0.0997]	0.733*** [0.0510]	0.734*** [0.0509]	0.734*** [0.0507]
Prop. of coalition	0.203 [0.701]	1.555 [2.021]		-0.15 [0.655]	-0.218 [0.669]	-0.832 [0.908]	-0.838 [0.875]	-0.287 [0.639]	1.433 [2.558]
v. opposition elections	-0.678 [0.553]	-0.493 [0.551]		-0.35 [0.507]	-0.527 [0.517]	-1.327** [0.616]			-0.628 [0.589]
Prop. of close coalition	0.0527* [0.0306]	0.172 [0.151]		0.0438 [0.0289]	0.0419 [0.0287]	0.0858** [0.0434]			0.15 [0.170]
v. opposition elections	-0.00257*** [0.000938]	-0.0113 [0.00984]		-0.00243*** [0.000871]	-0.00223** [0.000894]	-0.00521*** [0.00158]	-0.00211** [0.000938]	-0.00250*** [0.000873]	-0.00362* [0.00203]
Vote margin squared	3.98E-06 [0.0000206]	0.00011 [0.000118]		0.000014 [0.0000190]	8.4E-06 [0.0000195]	0.00005 [0.0000309]	2.09E-05 [0.0000219]	1.5E-05 [0.0000197]	-9E-06 [0.0000401]
Vote margin cubed									
Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State/district fixed effects?	District	District	District	District	District	State	District	District	District
Observations	3,135	3,135	3,135	3,135	3,135	3,135	3,135	3,135	3,135
Adjusted R-squared	0.75	0.92	0.93	0.93	0.93	0.84	0.93	0.93	0.93
1st stage F-stat. for time in ruling coalition	1,049	568	1,131	1,025	987	2,652	243	1,680	15

Notes: Controls include the proportion of the population that was scheduled caste (SC) in 1971, the proportion of the population that was scheduled tribe (ST) in 1971, dummies for whether the constituency was reserved for SCs or STs, the log male-female ratio, and the log number of houses and households in each constituency. Standard errors in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . See text for details.

all elections between 1977 and 2001). This alternative instrumentation strategy takes into account the possibility that a close election influences subsequent close elections (however, recall that the results of each close election are quasi-randomly determined) by using only the results of the first election. Although substantially worse than before, the  $F$ -statistic for the new first-stage regression remains above 10, and these results remain consistent with those presented previously. Lastly, in regressions 8 and 9, we re-define close elections as those that were won with margins of 1% and 5%, instead of the 3.5% cutoff used in the main analysis. These results are also consistent with the main findings.

Altogether, the empirical analysis fails to provide any evidence for constituencies benefiting from voting in representatives who are members of the ruling coalition at the state level. Although the bivariate plots suggested a weakly positive relationship between the election of an MLA from the ruling coalition and the growth in literacy and SC literacy, these patterns disappear once we control for important confounding variables and for endogeneity.

### *3.2. Explaining the null effect*

The evidence that we have presented thus far suggests that electing members of ruling coalitions fails to improve literacy rates. We consider several possible reasons that that this could be the case.

First, ruling coalitions might improve literacy under particular circumstances—when certain pro-poor parties are in power, in party strongholds, in some states or when mechanisms of accountability (such as the media) are strong. These possibilities could be consistent with the estimated overall null-effect. To assess whether this is the case, we explore heterogeneous treatment effects in Table 6.

We start by examining whether voting for ruling coalitions led by the Indian National Congress (INC)—a party associated with the poor—have boosted literacy rates.<sup>17</sup> To assess this possibility, we add a control for the proportion of time a constituency was represented by an INC ruling-coalition member (regressions 1 and 5 of Table 6). In a manner analogous to our main identification strategy, we instrument for this term using the proportion of close

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<sup>17</sup>Members of INC were in ruling coalitions 32% of the time studied, as compared with Bharatiya Janata Party (5% of the time) and the Communist Party of India (Marxist) (7% of the time).



INC-led ruling coalition versus opposition elections won by INC members. The instrument is positively and significantly associated with the endogenous variable, and the first-stage  $F$ -statistic is 121, indicating that the instrument is fairly strong. The estimated effect of electing a member of an INC-led ruling coalition is positive and large, suggesting that constituencies with INC MLAs had a 5 percentage point greater increase in literacy than other constituencies when the INC was in power in the state. The point estimate is, however, not statistically significant.

We next explore if ruling coalitions are particularly likely to invest in constituencies that are party strongholds. We coded “strongholds” as constituencies that elected the same party more than 50% of the years under study. By this definition, 29 and 7% of the constituencies were strongholds for the INC and the Communist Party of India (Marxist) (in contrast, only 1% of constituencies were strongholds for the Bharatiya Janata Party). We then examined whether quasi-randomly electing ruling coalition members from these strongholds boosted literacy rates (regressions 2 and 6). It was not found to do so.

Next, we ask whether ruling coalitions in particular states boosted literacy rates (regressions 3 and 7). Here too, none of the coefficients are statistically significant.<sup>18</sup> No state seems to have had ruling coalitions that were particularly prone to privileging their own supporters.

Finally, in regressions 4 and 8 we interact a state-level newspaper coverage variable (from Besley and Burgess 2002) with the proportion of time in ruling coalition.<sup>19</sup> As studies of accountability indicate that informed voters are more able to hold ruling coalitions to account (Besley and Burgess, 2002; Sen, 1999), we might expect this interaction term to be positive. But the point estimates are, in fact, negative. However, these results should be interpreted with caution, as the newspaper circulation variable is at the state level, not at the constituency level. Overall, our exploration of heterogeneous treatment effects fails to uncover political motivations behind the change in literacy between 1971 and 2001.

A second explanation for the null finding could be that ruling coalitions may attempt

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<sup>18</sup>These results should be interpreted with caution, since the disaggregation of the ruling coalition variable into 13 components degrades the first-stage  $F$ -statistics substantially.

<sup>19</sup>The uninteracted measure of newspapers is absorbed by the district fixed effects.

Table 6: Heterogeneous treatment effects

	% Literates			% SC literates						
	1	2	3	4	5	6	7	8	9	10
Prop. of time in ruling coalition	-3.111 [2.508]	-4.375 [10.51]		-0.755 [0.928]	-7.295 [8.054]	-2.684 [2.661]	-1.389 [3.634]		-0.946 [1.080]	3.587 [8.813]
Prop. of time in INC ruling coalition	5.258 [4.633]					4.305 [4.802]				
Prop. of time in ruling coalition X INC stronghold		-1.066 [19.14]					5.462 [7.659]			
Prop. of time in ruling coalition X Communist stronghold		76.77 [275.4]					-10.29 [84.31]			
INC stronghold		1.006 [13.30]					-3.479 [5.172]			
Communist stronghold		-52.88 [188.2]					7.909 [58.13]			
Prop. of time in ruling coalition, Andhra Pradesh			-39.12 [72.63]					-60.58 [110.6]		
Prop. of time in ruling coalition, Bihar			-2.035 [6.501]					4.505 [8.255]		
Prop. of time in ruling coalition, Gujarat			1.416 [8.923]					-4.472 [8.828]		
Prop. of time in ruling coalition, Karnataka			-1.029 [3.550]					-2.51 [6.093]		
Prop. of time in ruling coalition, Kerala			1.504 [3.980]					-0.88 [6.937]		
Prop. of time in ruling coalition, Madhya Pradesh			8.485 [9.862]					9.596 [13.25]		
Prop. of time in ruling coalition, Maharashtra			2.647 [8.967]					-2.363 [12.69]		
Prop. of time in ruling coalition, Orissa			-0.821 [111.0]					51.95 [167.3]		
Prop. of time in ruling coalition, Punjab			8.016 [6.628]					10.95 [8.842]		
Prop. of time in ruling coalition, Rajasthan			4.696 [8.957]					1.728 [10.81]		
Prop. of time in ruling coalition, Tamil Nadu			2.11 [4.783]					3.533 [6.783]		
Prop. of time in ruling coalition, Uttar Pradesh			-3.645 [6.033]					-5.259 [8.777]		
Prop. of time in ruling coalition, West Bengal			12.82 [33.58]					8.119 [39.26]		
Newspaper coverage X Prop. of time in ruling coalition				-2.591 [1.992]					-3.860** [1.828]	
Governance measure X Prop. of time in ruling coalition					0.739 [0.858]					-0.462 [0.941]
Controls?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,137	3,137	3,137	3,069	3,069	3,135	3,135	3,135	3,067	3,067
Adjusted R-squared	0.92	0.81	0.87	0.92	0.92	0.93	0.93	0.83	0.93	0.93

Notes: Controls include the proportion of the population that was scheduled caste (SC) in 1971, the proportion of the population that was scheduled tribe (ST) in 1971, dummies for whether the constituency was reserved for SCs or STs, the log male-female ratio, and the log number of houses and households in each constituency. Standard errors in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . See text for details.

Table 7: Determinants of the number of primary schools per capita in 2001

	1	2	3	
	OLS	OLS	2SLS	
			1st stage	2nd stage
Prop. of seats won by coalition members	-4.662 [3.377]	-2.098 [2.462]		-1.137 [5.689]
Initial value of DV	1.079*** [0.0136]	1.056*** [0.0294]	2.4E-05 [0.0000620]	1.056*** [0.0276]
Prop. of seats won by coalition members in close elections against opposition			0.944*** [0.0297]	
Prop. of coalition v. opposition elections			0.475*** [0.0225]	-8.858* [4.662]
Prop. of close coalition v. opposition elections			-0.587*** [0.0282]	2.396 [3.130]
Vote margin in close coalition v. opposition elections			0.0263*** [0.00129]	-0.094 [0.205]
Vote margin squared			-0.000271** [0.000114]	0.00877 [0.00972]
Vote margin cubed			-4E-06 [0.00000282]	-6E-05 [0.000162]
Controls?	No	Yes	Yes	Yes
District fixed effects?	No	Yes	Yes	Yes
Observations	2,301	2,301	2,301	2,301
Adjusted $R$ -squared	0.73	0.89	0.79	0.89
1st stage $F$ -stat. for time in ruling coalition				1,007

*Notes:* Controls include the proportion of the population that was scheduled caste (SC) in 1971, the proportion of the population that was scheduled tribe (ST) in 1971, dummies for whether the constituency was reserved for SCs or STs, the log male-female ratio, and the log number of houses and households in each constituency. Standard errors in brackets. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ . See text for details.

to improve literacy by building schools, but that these efforts do not increase literacy because of teacher absenteeism or other local-level factors. To evaluate this possibility, we investigated whether ruling coalitions built more primary schools in areas where they won elections. Table 7 presents the results. The specifications are the same as in our main analysis, with the dependent variable specified as the number of primary schools per capita in each constituency in 2001, as calculated from the Census of India's village directory. Since this source is published for rural areas, observations are restricted to rural areas. Also due to data constraints, the initial value of the dependent variable is from 1991.<sup>20</sup> The results fail

<sup>20</sup>The school data is part of the village directory, which we had access to from 1991 and 2001, but not from 1971. In this case the proportion of time in ruling coalition is calculated for the years 1991 to 2001.

to suggest that ruling coalitions boost the number of primary schools per capita. In fact, the coefficients for the proportion of time in ruling coalition variable are negative both for the OLS specifications and the instrumental variable specification. It therefore does not seem to be the case that the state governments make efforts to boost literacy in constituencies they won by building more schools there.

Third, it might be that growth in literacy is insulated from political influences by the bureaucracy responsible for implementing educational policies. The Indian bureaucracy is an influential elite institution inherited from British rule in India. The upper civil service—the Indian Administrative Service—is often referred to as the “steel frame” of India (Potter, 1986). Our interviews with civil servants, one of which was cited previously, suggested that some civil servants feel pressured to follow instructions from the political leadership out of fear of being transferred to a less favorable posting. One might think that the bureaucracies in states with better governance structures should be less susceptible to such pressures. To explore this hypothesis, we interact our independent variable of interest with a state-level governance measure due to Mundle et al. (2012). Regressions 5 and 10 presents the results of this exercise, and do not suggest that variation in governance standards mediates the impact of politics on literacy.<sup>21</sup>

In this section, we have bound three broad explanations for our findings wanting. One possibility that we are left with is that ruling coalitions do not try to influence literacy level to constituencies where they won the election. Our findings are subject to a number of caveats, which we note below.

#### **4. Conclusions**

Evidence from across the world has shown that the distribution of state resources is frequently politicized. Resources tend to be spent in areas that support ruling coalitions, particularly on easily targetable goods that result in quick payoffs. In this paper, we have investigated whether political alignments affect literacy, a less easily-targeted and slow-to-change development outcome, in the long run.

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<sup>21</sup>The uninteracted governance measure is absorbed by the district fixed effects.

Over a 30 year period, we find no evidence that constituencies that voted for members of state ruling coalitions in India differentially improved their literacy rates. Politicians may be providing their supporters with clientelistic services, but these do not translate into substantial differences in literacy increases in constituencies that voted for winners rather than losers over the long term. This null finding is precisely estimated, and remains consistent across several robustness checks. We are able to rule out the possibilities that ruling coalitions target literacy improvements to particular subsets of constituencies, that their attempts to improve literacy are stymied by the failure to translate more schools into literacy or by an apolitical bureaucracy.

Our results are subject to several important caveats. First, they are largely specific to the outcome (literacy) and context (India) that we have considered. That said, we have some reason to believe that our results might generalize across development outcomes, since we have shown that they are reconfirmed using three other development outcomes, since literacy is generally positively correlated with public goods provisioning in India (Banerjee and Somanathan, 2007), and since the possible reasons for the non-effect detailed previously (literacy is too slow-moving an outcome to be of interest to politicians, voters reward the announcement of projects, rather than their implementation, and India has a reasonably-functioning bureaucracy) probably obtain elsewhere.

Second, having focused our attention at the constituency level, we cannot rule out the possibility that governments geographically target areas within constituencies. Examining development patterns at a disaggregated level of analysis merits future study. That said, even if these patterns exist, they are probably not particularly pronounced since they are not evident in constituency-level literacy rates. Relatedly, we found that the change in literacy rates between 1971 and 2001 is strongly positively correlated with the electoral turnout in a constituency. This pattern is not statistically identified and may be the result of reverse causality, but may also point to an important relationship between political mobilization and development patterns, and as such could be an important topic for future research.

Third, and although the empirical strategy employed here has the benefit of allowing us to estimate the causal effect of being represented by governing coalitions, the estimates so recovered are local average treatment effects. More specifically, the estimates calculated here

might particularly obtain in close elections. If governments target constituencies that they win by large margins for improved public goods provisioning, our focus on close elections will have caused us to underestimate the effect of being represented by ruling coalitions. However, this concern is mitigated by the fact that OLS estimates with controls yield similar results.

Fourth, and although we have found that voting for opposition legislators does not “cost” a constituency literacy, we do not mean to suggest that there are no welfare consequences from the politicized distribution of resources in the long run. Lobbying for altering spending patterns is likely to create dead weight losses, and although specific constituencies might not win or lose from their alignments, all constituencies might do better without any politicized redistribution. In other words, although political alignments might not differentially affect literacy patterns across India’s state constituencies, the politicization of the distribution of resources in India might reduce literacy across the board. Assessing the degree to which this is the case is beyond the scope of this paper, and would require a different research design.

Our findings advance the literature on the politicized distribution of state resources. The evidence presented here suggests that the extensive politicization of the provision of resources in India does not differentially affect constituency literacy rates in the long run. Any assessment of the consequences of the politicization of resource distribution in India ought to take this into account. The common observation that governments systematically reward their supporters and punish others has its limits.

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