Political Favoritism and Economic Growth: Evidence from India *

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Abstract

How does political favoritism impact local economic growth? Using a repeated census of Indian firms that we constructed, and a regression discontinuity design built around close elections from 1990-2005, we show that locations represented by politicians affiliated with the state-level ruling coalition generate 1.6 percentage points more private sector jobs per year than constituencies represented by politicians not in the governing coalition. Consistent with this, stock prices of firms show cumulative abnormal returns in the month following the election of a coalition candidate relative to a non-coalition candidate in the constituency where the company is headquartered. Detailed data on location and industrial classification of firms allow us to investigate the mechanism for this effect. We find the effect is driven entirely by private sector firms, with no effect on employment in state-owned firms. Further, we identify no effect on public infrastructure. Finally, we use international survey data to classify industries based on their dependence on bureaucratic inputs, such as licenses and permits. We find the effect of political alignment is largest in industries that depend most on government officials. This suggests that politicians are able to dynamically control the restrictiveness of regulation, and may do so for political gain.

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1 Introduction

What is the effect of political favoritism on economic growth? While there is little agreement on whether democracy promotes good public policy (?; ?), it has been widely shown that political favoritism is one of democracy's regular features. The allocation of government resources is influenced by political interests, whether toward supportive voters (Finan, 2004; Ansolabehere and Snyder, 2006; Aghion et al., 2009), political allies (Albouy, 2009; Khemani, 2007; Hoover and Pecorino, 2005) or swing states (Arulampalam et al., 2009; Dixit and Londregan, 1996).

Most of the evidence on political favoritism focuses on the behavior of politicians or the outcomes at the level of the recipient of a government transfer. Favored locations benefit from additional government transfers (Albouy, 2009; Ansolabehere and Snyder, 2006) and public spending (Finan, 2004; ?) ; favored firms are more likely to receive credit from state banks (Cole, 2009; ?; Carvalho, 2010) or corporate bailouts (?).

The effect of politically motivated allocations on the aggregate economy of targeted locations is less studied, and more ambiguous. The direction of the effect of government spending on private sector activity has been estimated to be both positive and negative (Cohen et al., 2011; ?; Shoag, 2011). Politicians may be able to create local jobs (Carvalho, 2010), but they may also disproportionately tax and embezzle funds from their supporters (Sukhtankar, 2012; ?). In short, being politically favored appears not to be unambiguously advantageous.

This paper uses data from India to measure the effect of one kind of political favoritism on local employment growth. Exploiting the representative nature of Indian democracy, we use a regression discontinuity design to test whether locations represented by members of the state-level ruling party experience faster employment growth in the period 1990-2005. Focusing on the state legislative level in India provides a wide range of growth experiences

and political outcomes within a common institutional framework.

Part of the challenge of studying the aggregate effects of political favoritism is that economic data is not often collected at the level of the political district. Census boundaries rarely correspond to frequently changing political boundaries and economic data tends to be aggregated to a higher level than the political constituency. We constructed a constituency-level panel of locations based on village and town-level censuses of firms conducted in 1990, 1998 and 2005.

We show that private sector employment growth is 1.7 percentage points per year higher in locations favored by powerful parties, relative to disfavored locations. This large effect is corroborated by evidence from Indian stock market data, suggesting that market participants recognize the importance of local politician membership in state ruling parties. We first identify the constituencies where companies' headquarters are located. Then, exploiting close elections in those constituencies, we show that firms experience cumulative abnormal returns in the range of 12-15% in the month following state elections, when the winner in their constituency is allied with the state-level ruling party.

We explore three mechanisms for this effect: (i) direct transfers; (ii) government-supplied essential inputs to production; and (iii) discretion in the application of government regulation.

In the category of direct transfers, the easiest way for politicians to transfer funds to an area as small as a single constituency are through political control of state firms, and procurement contracts to private sector firms. We find no effect of political favoritism on either government employment or local procurement. Our main effect on employment growth is driven entirely by private sector employment. Industries likely to have a high share of their contracts with the state are not more affected by our measure of favoritism, suggesting that procurement does not drive the main effect.

In the second category, we find no evidence that political alignment affects the construc-

tion of public goods over the sample period. Favoritism does not have a larger effect either on industries highly dependent on credit, nor in locations with more state banks, where politicians would be expected to have greater control over the supply of credit.

In the final category we consider the possibility that politicians have control over the implementation of regulation. This possibility is not considered by most theoretical models, which focus on policy outcomes. However, anecdotal evidence from India suggests that regulation is not consistently enforced, and local politicians wield a large degree of influence over ostensibly neutral bureaucrats (Iyer and Mani, 2012; ?). Using industry-level data on firms' interactions with government officials, we show that political favoritism has the largest effect on firms in industries that have a high dependence on government inputs such as permits and licenses, and in industries likely to be visited by government officials for various reasons.

Section 2 provides the institutional context for our regression discontinuity design. Section 3 describes the sources and construction of our data. Section 4 explains the empirical strategies involved in the regression discontinuity and event study. Section 5 describes out main results on the effect of political favoritism. Section 6 examines the mechanisms that could drive this result, and Section 7 concludes.

2 Background and theoretical framework

We focus on party politics at the state level in India. Indian federalism grants significant administrative and legislative power to states. States incur 57% of total expenditures, though almost half of these are financed by transfers from the center. States have administrative control over police, provision of public goods, labor markets, land rights, money lending, state public services, and retail taxes. Federal bureaucrats (i.e. the Indian Administrative Service) are recruited centrally, but their administration and operation are administered at

the state level. Survey evidence suggests that among all levels of government, the majority of Indian citizens hold State governments responsible for provision of public goods and public safety (Chhibber et al., 2004).

Indian state politics are characterized by a parliamentary system, where independent or party-affiliated candidates compete in first-past-the-post elections for single seat constituencies. Given the low likelihood of any party gaining a majority, in most cases parties compete in elections as coalitions. However, we do take into account the possibility of coalitions changing after elections take place.

Our dependent variable of interest is an indicator of whether a constituency's representative is a member of the state ruling coalition. To avoid bias caused by parties switching allegiances after elections, we group parties into coalitions based on allegiances declared after the previous election, with details on our method described below. We exclude constituencies with independents in first or second place as we cannot determine their coalition alignment.

We model political parties as being exclusively motivated by re-election. We assume voters cannot fully observe politician behavior, but reward incumbents when economic outcomes are good. This approach is supported by evidence that voters reward and punish incumbents even for events that are beyond politicians' control (Cole et al., 2012; Wolfers, 2007). As a result, the ruling coalition is motivated to make investments to increase economic growth in constituencies represented by its members. It may also be worthwhile for the coalition to inhibit growth in constituencies represented by its opponents - if and only if the coalition believes voters will punish the non-aligned incumbents. Both these effects move the same way, causing aligned constituencies to perform better than non-aligned constituencies.[1] The RD identifies the total effect of party behavior, which is the effect of having an aligned

[1]The classic models of Dixit and Londregan (1996) and Lindbeck and Weibull (1993) suggest that the coalition will get the greatest return by focusing its efforts on swing constituencies, where electoral investment is most likely to result in seats gained. Since the local treatment effect identified by the RD is centered on swing constituencies, our method does not explicitly test for a swing effect.

representative minus the effect of having a non-aligned representative.

Several other papers address similar issues to ours. Chattopadhyay and Duflo (2004) and de Janvry et al. (2010) point to the importance of politician identity for the provision of public goods. These papers focus on how the politician's identity affects her own interests, whereas in our case politician identity determines whether or not he is perceived as an ally by the ruling coalition.

Brollo and Nannicini (2011) find that municipalities with state-allied incumbents receive greater transfers in election years. Like us, they find evidence that this effect is driven by non-aligned municipalities, suggesting that the center is actively involved (by withholding funds) even in jurisdictions where it does not hold formal power. Arulampalam et al. (2009) find that center to state transfers in India are higher when state parties are aligned with the federal coalition. We differ from these papers in focusing on firm-level economic outcomes rather than political inputs like transfers.

3 Data

The government roles most relevant to firm operation are at the state level. But identifying the economic effects of state-level political behavior is complicated by the fact that state political constituencies do not correspond to the standard boundaries used by India's Ministry of Statistics. [2] In order to measure employment growth at the constituency level, we have geographically matched town and village-level data from three rounds of the Indian Economic Census and two rounds of the Population Census to state political constituencies. As far as we know, this is the first dataset linking time series economic and population outcomes to electoral outcomes in legislative constituencies in India.

[2]The Annual Survey of Industries (ASI) and National Sample Survey (NSS) report data at a district level. There are approximately 10 state legislative constituencies per district. The Economic Census and Population Census report subdistrict-level data; these subdistricts are comparable in size but do not match up to legislative constituencies.

The Indian Economic Census is a comprehensive census of all firms not engaged in crop production, both formal and informal. We use firm-level data from the 3rd, 4th and 5th rounds, undertaken respectively in 1990, 1998 and 2005.These data are publicly available from MoSPI, but are not organized as a panel. With the assistance of partial keys from MoSPI, we reconstructed panels at the village, town, district and subdistrict levels, then linked them to population census identifiers. The Economic Census contains a small number of details about each firm, including the number of employees and some of their characteristics, the firm's source of power, details about the firm's registration, and the industrial code of the primary product. The major asset of this dataset is the rich detail on spatial location and industrial classification of products.

The Indian Population Census provides village and town demographic data in 1991 and 2001, as well as local public goods (roads, electricity, schools and hospitals), distances from villages to major towns, and land area. We obtained geographic coordinates for population census locations from ML Infomap and matched them to the bounding polygons of legislative constituencies. All population and economic census data was then aggregated to constituency level. We measure employment growth as change in constituency-level employment from 1990-98 and 1998-2005.

Election data for the period 1980-2005 was downloaded and cleaned from the web site of the Election Commission of India. We created a time series of political parties by hand-matching party names, taking into account party fragmentation and consolidation. We constructed state coalition alliances from newspaper articles reporting election results.

Finally, for stock prices we use Datastream's monthly return index for individual equities from the National and Bombay Stock Exchanges.

4 Empirical strategy

We use a regression discontinuity design to identify the effect on a constituency of being represented by an MLA who is aligned with the state ruling coalition. For example, in Bihar in 1995, the Janata Dal party and its coalition allies (CPI, CPM, JMM) won 209 out of 324 seats. A constituency in Bihar is thus considered to be aligned in 1995 if its MLA is a member of one of the four coalition parties, and non-aligned if its MLA is a member of another official party. We exclude constituencies where one of the leading two candidates ran as an independent, as we do not know whether independent candidates vote with or against a ruling coalition. [3]

New alliances can form after an election, as the dominant party seeks to obtain enough allies to control more than 50% of seats in a state. Post-election reconfiguration of alliances could invalidate the RD if unobservable characteristics of candidates (e.g. competence) affect their decision or ability to join the ruling coalition.

To avoid this potential bias, we assign parties to coalitions according to their alignment following the previous election. We then define a coalition as winning if the plurality party in the previous election is in the ex-post winning coalition in the current election. [4] In some cases, this method causes us to incorrectly label coalition parties as non-coalition and vice versa; this creates some contamination in the RD design, biasing our estimates toward zero. The bias is likely to be small; we accurately predict candidate alignment in 88% of sample elections, suggesting that post-election coalition switching among major parties is rare. From this point forward, we use the term candidate alignment to mean predicted alignment rather than ex-post alignment.

The premise of the regression discontinuity design is that there is enough noise in voting

[3] Candidates from unofficial parties are reported by the Electoral Commission as independents, so cannot be distinguished from true independents and are excluded from the sample.

[4] An alternate measure of winning is defined by whether the leader of the current coalition was part of the ruling coalition in the previous election. Our results our robust to the use of either of these measures.

behavior and measurement, that in a very close election, the winner, and thus the alignment of a given constituency, is effectively chosen at random. By comparing locations narrowly won by candidates aligned with the ruling party with locations narrowly lost, we can identify the treatment effect of being represented by a coalition-aligned politician.

Following Imbens and Lemieux (2008), our main specification estimates a local linear regression on both sides of the cutoff point, using a triangular kernel with a bandwidth optimally calculated according to Imbens and Kalyaranaman (2009). We test robustness with alternate bandwidths and a rectangular kernel, as well as by estimating a polynomial fit to the running variable over the full set of data, described in more detail below.

In each sample constituency, let v^a represent the number of votes for the top coalition-aligned candidate, v^n the votes for the top non-aligned candidate, and v^{tot} the total number of votes. We define our running variable *margin* in constituency c at time t as

$$margin_{c,t} = \frac{v^a_{c,t} - v^n_{c,t}}{v^{tot}_{c,t}} \tag{1}$$

By construction, *margin* is positive for coalition-aligned constituencies, and negative for non-aligned constituencies. We thus define the forcing variable *aligned* as an indicator for whether *margin* is greater than zero.[5]

Equation 2 describes the local linear estimation of the effect of political alignment on the outcome variable:

$$Y_{c,t} = \beta_0 + \beta_1 align_{c,t} + \beta_2 margin_{c,t} + \beta_3 margin_{c,t} * aligned_{c,t} + \boldsymbol{\zeta}\mathbf{X}_c + \boldsymbol{\eta}\mathbf{Y}_t + \boldsymbol{\gamma}\mathbf{S}_i + \epsilon_{c,t} \tag{2}$$

$Y_{c,t}$ is a constituency-level economic outcome, $\mathbf{X}_{c,t}$ is a vector of constituency controls, and $\mathbf{S}_i$ and $\mathbf{Y}_t$ are state and year fixed effects. The effect of coalition alignment is identified

[5]Another interpretation of *margin* is that it is the distance in vote share that the ruling coalition was from losing a given location. This interpretation justifies the definition of margin even in cases where the coalition-aligned candidate did not finish in first or second place.

by β_1, in the local region where $margin$ is very close to zero.

We test robustness by fitting separate 3rd degree polynomial functions to the running variable $margin$, and identifying the discontinuity at the alignment threshold as:

$$\beta = \lim_{m \to 0^+} \mathbb{E}[Y_i | margin_i = m] - \lim_{m \to 0^-} \mathbb{E}[Y_i | margin_i = m]$$

Equation 3 is the full estimating equation:

$$Y_{c,t} = \beta_0 + \beta_1 * aligned_{c,t} + f(margin_{c,t}) + g(margin_{c,t}) * aligned_{c,t} + \boldsymbol{\zeta} \mathbf{X}_c + \boldsymbol{\eta} \mathbf{Y}_t + \boldsymbol{\gamma} \mathbf{S}_i + \epsilon_{c,t} \quad (3)$$

$f(\cdot)$ and $g(\cdot)$ are 3rd degree polynomial functions, and other variables are defined as in equation 2. β_1 estimates the effect of political alignment at the discontinuity, where $margin = 0$.

All standard errors are clustered at the state level to account for spatial correlation of the dependent variable. The time between observations of the outcome ranges from 7 or 8 years (Economic Census) to 10 years (Population Census).

As states follow separate election calendars, we define an electoral outcome as the first election in a state after the baseline measurement period.[6] We ignore all elections other than the first in a given period, but we test robustness over different inclusion sets. Figure 1 visualizes this process. Incumbency conveys a zero or negative effect in Indian state politics (?), so the exclusion of subsequent elections from the sample is not likely to create substantial bias through an incumbency channel. Given that the economic outcome periods span seven or eight years, our estimate of the effect of political alignment is biased downward to the extent that each observation includes several years without the identified politician being in power.

[6]Example: For the Economic Census period 1990-98, we use elections from 1991 (Assam, Haryana, Kerala, Tamil Nadu, UP, WB), 1992 (Punjab), 1993 (Chhattisgarh, Himachal Pradesh, MP, Meghalaya, Mizoram, Nagaland, Rajasthan, Tripura) 1994 (AP, Karnataka) and 1995 (Arunachal, Bihar, Gujarat, Jharkhand, Maharashtra, Manipur, Orissa).

4.1 Identifying the mechanisms

In addition to firms' employment characteristics, the Economic Census provides rich detail on firm location and industry. We shed light on the mechanisms by which politicians affect firm outcomes by examining the characteristics of firms most affected by political considerations. This sheds light on the constraints facing firms, as well as the levers that politicians are able to apply. As described above, we focus on three classes of mechanisms: (i) pure transfers; (ii) supply of factors of production; (iii) supply or restriction of regulatory inputs.

We use three types of data in this section. The first is based on characteristics of firms identified by the Economic Census, which include ownership (public or private), source of credit (primarily banks or informal) and source of power. We test for the importance of these characteristics by running equation 2 at the constitutency-level on total employment of firms sharing a given characteristic, e.g. total employment in private firms.

The second type of data is based on the detailed industrial classification of the primary product that a firm produces. We match this industrial classification to average industry characteristics collected from two other datasets: (i) The World Bank Global Enterprise Survey; and (ii) The Annual Survey of Industries. We then dichotomize the variables of interest (e.g. Percentage of time management spends meeting with government officials) from these surveys, and use them to divide the firm sample into a high and low bin for each variable. We then interact this firm characteristic with the main treatment variables, $aligned$, $margin$, and $margin * aligned$. The coefficient on the high interaction tells us whether firms in industries characterized as high are driving a higher share of our main treatment effect than firms characterized as low.

The third type of data is the firm's location. Characteristics of a firm's location may affect a politician's ability to influence local economic activity. For example, it will be more difficult for a politician to channel credit to firms in locations that do not have state-owned banks. As above, we test location characteristics by interacting them with the main

treatment variables.

5 Results

5.1 Balance

Figure 7 describes the density of the forcing variable, $margin$. Constituencies with $margin > 0$ are represented by coalition-aligned MLAs. Panel A shows the distribution of the win margin across our entire sample of Indian elections from 1980-2003. Panel B restricts the range to races with win margins of less than 5% and shrinks the bin size to focus on the discontinuity in the forcing variable. Both graphs suggest the density is continuous at zero. The mode of the $margin$ distribution is greater than zero because on average the ruling coalition wins more often than it loses.

Panel C shows the fit of a McCrary test for discontinuity in the density of the running variable at zero, for the full sample of elections (McCrary, 2008). Panel D restricts the McCrary test to the sample of elections matched to the population and economic census and used in subsequent analysis. The t statistics for a discontinuity at zero are respectively 0.80 and 0.98, suggesting that there is no discontinuity in the running variable at the alignment threshold.

Table 1 shows the result of running equation 2 on baseline parameters. If the outcomes of close elections are decided by variation that is as good as random, these results should not be correlated with baseline characteristics. Column 1 estimates equation 2 with baseline log employment as the dependent variable. Column 2 adds state fixed effects. The dependent variables in columns 3-6 are baseline population, number of firms, average firm size and rural job share. The coefficient on the forcing variable *aligned* is insignificant in all of these cases.

5.2 Visual regression discontinuity

Figure 4 graphs *margin* on the x-axis against constituency-level log employment growth, with a non-parametric best fit to the raw data on each side of the discontinuity. Across the majority of the sample, there does not appear to be a relationship between win margin and employment growth; however, there is a steep fall in employment growth in constituencies where the ruling coalition experienced narrow defeat, and a very narrow increase in employment in constituencies where the ruling coalition narrowly won.

The concentration of effects of political alignment close to the discontinuity are consistent with the theory: since politicians need to expend some effort to create or inhibit growth, they will concentrate their efforts in swing constituencies, where their actions are most likely to alter the result of a future election. As the RD strictly provides identification on the size of the discontinuity, we forgo discussion of the striking asymmetry of the effect around zero for a later section.

Figure 3 creates the comparable graph with pre-election employment on the y-axis. Consistent with the results from Table 1, this graph shows no apparent discontinuity at the coalition alignment threshold.

5.3 Employment growth

Table 2 is the regression analog of Figure 4. Column 1 runs equation 2 with log employment growth as the dependent variable, with state and year fixed effects. Column 2 adds baseline constituency-level controls and column 3 weights by baseline employment. All three regressions show a statistically significant ($p \in [0.03 - 0.05]$) effect of political alignment on employment growth, with a coefficient of 0.015 . Near the discontinuity, constituencies with coalition-aligned MLAs grew around 11 percentage points more than non-aligned constituencies over a seven year period, or about 1.5 percentage points per year.

Columns 4-6 show the result of running equation 3 on the same outcome. The coefficients are slightly smaller, with the same level of significance.

Figure 5 shows the robustness of these results to alternate kernels and bandwidths. Panel A shows the treatment effect of equation 2 with bandwidths from 1-10%. Panel B shows the same information using a rectangular kernel. Panel C repeats limits the election sample to a 4-year window of elections instead of a 5-year window used for Table 2. Panel D shows the effect of limiting the range of the running variable when running the polynomial specification in equation 3. The figure demonstrates that the treatment effect is robust to alternate bandwidth and kernel specifications. Panel D shows that the polynomial estimates are significantly affected by the inclusion or exclusion of elections won or lost by large margins; for this reason, we use the more stable local linear regression approach in Equation 2 from this point forward. Reassuringly, the estimates from Equation 2 fall in the middle of the range of outcomes produced by the full sample polynomial specification.

5.4 Stock prices

We next consider whether coalition alignment affects the stock prices of publicly traded firms. If political behavior has known real effects on firm growth, rational market participants should adjust their valuations of firms as the political environment changes. We measure the effect of political alignment on firm earnings by conducting an event study (MacKinlay, 1997) using monthly stock returns from India's two major stock exchanges.

We matched company headquarters to constituencies using their listed pincodes, and latitudes and longitudes from the GeoNames pincode database. We focus on companies located outside of India's ten largest urban centers, as companies located in major cities are less likely to do the majority of their business in the constituency where their headquarters are located. We identified 52 constituencies that experienced 166 close election events between 1990 and 2010, the period for which we have wide stock market coverage.

For each event, we calculate cumulative abnormal returns as the residual from a market model (Equation 4) estimated on a period from 24 months to 6 months prior to an election:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \nu_{i,t} \tag{4}$$

where $R_{m,t}$ is a value weighted market return index and $\nu_{i,t}$ is an orthogonal error term.

We estimate Equation 5 to determine whether coalition alignment generates abnormal returns for local firms in the month following a close election:[7]

$$CAR_{i,t-1\to t+1} = \beta_0 + \beta_1 align_{i,t} + \beta_2 margin_{i,t} + \beta_3 margin_{i,t} * aligned_{i,t} + \boldsymbol{\zeta}\mathbf{X}_{i,t} + \boldsymbol{\eta}\mathbf{Y}_t + \boldsymbol{\gamma}\mathbf{S}_i + \epsilon_{i,t} \tag{5}$$

The running and forcing variables, *margin* and *aligned* are defined as in Equation 2. $CAR_{i,t-1\to t+1}$ is the cumulative abnormal return of a stock from the month before to the month following an election.[8] $\mathbf{X}_{i,t}$ is a vector of constituency controls, and $\mathbf{S}_i$ and $\mathbf{Y}_t$ are state and year fixed effects. β_1 identifies the local effect of coalition alignment on stock returns. As before, we weight with a triangular kernel within the optimal bandwidth.

Table 3 shows the estimation of the event study. Column 1 is the baseline model without fixed effects. Column 2-4 respectively add fixed effects for (2) state, (3) state and year; and (4) state * year. Examining the coefficient on *aligned*, we find that the election of a coalition-aligned candidate is associated with a positive abnormal return in the range of 12-15% in the month following the election.

Columns 5-6 are placebo tests, using CAR in the month before the election as the dependent variable. If election results are truly a surprise, we should identify no effect of election outcomes on pre-election returns. As expected, the coefficients are close to zero and not

[7] Closeness of election in this case is important both for the identification of the RD, and to plausibly believe that the anticipated election result has not been priced in before the election takes place.

[8] We are not able to precisely identify a election outcome date, as voting often takes places on multiple days and results are not officially announced for days or weeks after voting ends. We define the end of our period as the last day of the month in which official electoral results were reported.

statistically significant.

These results indicate that the importance of coalition alignment to firm growth is known and acted upon by market participants. Note that publicly traded firms differ substantially from the typical firm in the economic census (i.e. the sample for Table 2); finding this result in both datasets suggests that political behavior affects a wide spectrum of firms.

6 Mechanisms

We next explore the mechanisms that politicians use to affect local employment growth. We investigate three classes of mechanisms that describe how politicians could substantially affect employment growth in favored constituencies: (i) pure transfers; (ii) supply of factors of production; (iii) supply or restriction of regulatory inputs.

6.1 Pure transfers: government jobs and procurement

In this section, we examine transfers from government to firms and individuals.[9] We consider government job creation as a transfer to individuals, and government procurement contracts as a transfer to firms.

Table 4 separates employment growth in private firms from employment growth in public firms. In columns 1-3, the dependent variable is employment growth in government-owned firms, which include all public sector establishments. In columns 4-6, the dependent variable is employment growth in privately owned establishments. The coefficient of interest is almost twice as large for private than for government firms, but the difference between the two is not statistically significant from zero, based on a joint signficance test. The effect of political favoritism on employment in government firms is not distinguishable from zero, though this

[9]Our empirical design can only test for differences in transfers between favored and disfavored locations; thus, we cannot tell substitution of transfers from a change in the total level of transfers.

is in part due to a larger standard error.[10] While we cannot say definitively that the effect of political favoritism is driven by private sector firms, it is clear that politician influence over hiring at public sector firms is not driving our main effect.

6.2 Factors of production

In this section, we consider essential inputs to the production function of firms that are commonly supplied by the state. These include public infrastructure and credit from state-owned banks.[11]

The ruling coalition at the state level has control over the location of a substantial share of local public goods, such as roads, schools, and electricity infrastructure. These government inputs are essential to operation in many industries, and are too expensive for any but the largest firms to build at their own expense.

To test the hypothesis that the effect of political favoritism on employment growth is driven by construction of public infrastructure, we run equation 2 with changes in public goods between 1991-2001 as dependent variables. Table 5 shows the RD estimates of coalition alignment on construction of new roads and electricity infrastructure. Columns 1, 2, 4 and 5 use population census data on presence of these public goods; column 3 is based on firm self-reports of source of power. We can detect no effect on road construction or electricity connection in towns. The table also reports the mean growth in the dependent variable over the same period; all our point estimates and standard errors are small relative to mean growth in this period.

Table 6 shows the effect of coalition alignment on constituency-level growth in schools and hospitals from 1991 to 2001. None of the coefficients on the alignment variable are sta-

[10] The larger standard error is in part due to the fact that public employment is only 17-20% of total employment over the sample period.

[11] Credit from state-owned banks could also be considered a transfer; however, given the dominance of the state in India's banking sector, formal credit is largely a government-supplied input.

tistically distinguishable from zero, and the estimates and standard errors are small relative to growth in these publicly provided inputs over the sample period.

In summary, there is no indication that the firm-level effect of political favoritism is being driven by an increase in public infrastructure in favored constituencies. This finding is consistent with other work on India finding that citizen mobilization and national political agendas have played the dominant role in determining which regions gained public goods (Banerjee et al., 2005; Banerjee and Somanathan, 2007).

We next to turn to credit from state owned banks. Lending in India is known to respond to political cycles (Cole, 2009), and data from Brazil suggest that politicians use state owned banks to reallocate private sector employment growth across legislative constituencies (Carvalho, 2010). To test whether a credit channel can account for the effect of political favoritism on local employment growth, we run equation ??, adding an interaction term between the electoral variables $margin$, $aligned$, $margin * aligned$, and dummy variables indicating whether a firms' dependence on external finance is higher than median. We draw these measures from two sources: (i) The World Bank Global Enterprise survey asks firms their share of bank financing over working capital, as well as whether they have taken new loans this year; (ii) Rajan-Zingales' industry-level measures of dependence on external finance dependence (Rajan and Zingales, 1998). In addition to this industry-based measure of credit demand, we test a location-based measure of credit supply: the presence of state-owned banks in a constituency, measured as the number of banks per worker.

If credit is the major channel of political influence, these interaction terms should enter significantly into Equation ??. Table 7 shows the result of these regressions. The first two columns show industry level measures of credit dependence from the global Enterprise survey: (1) whether a firm has taken out a new loan in the past year; and (2) bank financing as a share of working capital. Column 3 repeats column 2 using a measure constructed from the Indian Annual Survey of Industries. Columns 4 and 5 test whether political favoritism has a

larger effect in locations with a large presence of (4) banks; and (5) state-owned banks. None of the interaction terms are statistically distinguishable from zero, suggesting that neither demand for credit nor availability of local banks affect the relationship between political favoritism and economic growth.

6.3 Regulatory inputs

While the Indian Administrative Service is a federal body, state politicians have significant influence over local bureaucrats, exerted through politicians' ability to reassign bureaucrats (Iyer and Mani, 2012). The bureaucracy is an important mechanism for the control of firms to the extent that firms' business requires inputs from the government, such as licenses, permits or land clearances. Using the World Bank Global Enterprise Surveys, we categorize industries based on the frequency and character of their relationships with public officials. As above, we create a dummy variable indicating whether an industry has above median interactions / dependence on government officials, and interact this variable with the RD variables. If the value of the interaction term is positive, it suggests that political favoritism has an outsize effect on firms with a high dependence on regulatory inputs.

Table 8 shows the result of the interacted model, with columns 1-4 using the following measures of dependence on government regulation: (i) Business was visited by government officials in last year; (ii) Percentage of senior management's time spent dealing with government officials; (iii) Needed an operating license in past year; (iv) Visited by tax officials in last year. The coefficients on all of four of these interactions are positive and significant, and the uninteracted measure of coalition alignment is small and indistinguishable from zero. Political favoritism does not have a large effect on firms that do not require significant inputs from government bureaucracy. This result is consistent with the idea that politicians exert political influence through their control of the bureaucracy, and have the ability to make it easier or more difficult for firms to navigate the regulatory environment.

7 Conclusion

Far from competing in an open market on a level playing field, firms in developing countries often depend heavily on public goods and government inputs. In turn, politicians may also be significantly affected by firm behavior (Shleifer and Vishny, 1994). This paper draws on highly localized firm-level employment data to show that politician identity significantly affects the prospects for firm growth in India.

We show that the alignment of a local politician with the ruling state coalition strongly predicts increased private sector employment growth in the range of 1 to 2 percentage points per year. This effect is corroborated by stock prices of large, publicly traded firms: in the month following elections, firms headquartered in constituencies represented by coalition-aligned politicians experience a 12-15% cumulative abnormal return.

Examining the most commonly cited mechanisms for political favoritism, we find no evidence that these effects are driven by geographic preference in government hiring, procurement, or construction of public goods. We do find evidence that the industries most affected by political favoritism are those with a high dependence on government officials and government-provided inputs, like licenses and permits, suggesting that politicians are able to influence the enactment of regulations in geographic areas. This is consistent with evidence that politicians can exert influence over bureaucrats by threatening geographic reassignment.

The evidence is consistent with a model of rational politicians who take into account the costs and benefits of the different levers at their disposal. Regulatory discretion is a relatively low cost tool; in equilibrium, bureaucrats may be pliable even if no transfers take place. India is well-known for its history of onerous regulations and barriers to the normal operation of firms. The evidence presented here is consistent with theories that bad regulation can persist because it gives public officials, in this case politicians, the ability to extract rents from local firms (Kruger 1974).

Table 1
Balance Test

	Emp	Emp (FE)	Population	Size	Count	Rural
Aligned (RD)	0.141	0.035	-0.016	0.035	-0.043	-0.041
	(0.127)	(0.101)	(0.055)	(0.085)	(0.144)	(0.043)
Margin	-5.221	-1.707	-0.593	-2.072	1.754	3.052
	(3.554)	(2.908)	(2.437)	(2.533)	(4.688)	(1.585)*
Margin * Aligned	3.566	-1.355	-0.986	-0.876	-2.251	-4.592
	(4.267)	(3.533)	(3.428)	(3.007)	(4.305)	(1.846)**
Constant	9.128	8.153	11.266	7.443	2.659	0.891
	(0.163)***	(0.156)***	(0.106)***	(0.110)***	(0.210)***	(0.064)***
N	663	663	334	663	663	663
r2	0.00	0.39	0.72	0.47	0.23	0.32

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table presents kernel regression discontinuity estimates of the effect of politician alignment with state ruling coalition on constituency level variables measured before the election. The dependent variable in column 1 is log employment. Column 2 adds state fixed effects. The dependent variables in columns 3-6 are (3) log population; (4) average firm size; (5) number of firms; (6) share of constituency population living in villages. Balance on observables is robust to inclusion of state and year fixed effects. Standard errors are clustered at the state level.

Table 2
Effect of MLA alignment on log employment growth

	1	2	3	4	5	6
Aligned (RD)	0.016	0.015	0.015	0.011	0.010	0.009
	(0.008)*	(0.007)**	(0.007)**	(0.005)**	(0.005)**	(0.005)*
Margin	-0.248	-0.239	-0.260	-0.157	-0.150	-0.144
	(0.234)	(0.230)	(0.216)	(0.049)***	(0.044)***	(0.043)***
Margin * Aligned	0.195	0.117	0.139	0.134	0.134	0.132
	(0.266)	(0.269)	(0.252)	(0.039)***	(0.050)**	(0.047)***
Baseline		-0.023	-0.023		-0.018	-0.018
		(0.005)***	(0.005)***		(0.003)***	(0.003)***
Constant	0.000	0.202	0.197	0.054	0.193	0.194
	(0.010)	(0.044)***	(0.043)***	(0.002)***	(0.027)***	(0.027)***
Weighted	No	No	Yes	No	No	Yes
Controls	No	Yes	Yes	No	Yes	Yes
N	663	663	663	3625	3625	3625
r2	0.13	0.26	0.25	0.09	0.20	0.19

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows kernel regression discontinuity estimates of the effect of MLA alignment with state ruling coalition on change in constituency-level log employment growth from 1990-98 and 1998-2005. Column 1 is the baseline regression on year and state fixed effects. Column 2 adds constituency-level controls, and column 3 weights observations by baseline log employment. Standard errors are clustered at the state level.

Table 3
Effect of MLA alignment on post-election stock returns

	t=0	t=0	t=0	t=0	t=-1	t=-1
Aligned	0.128	0.151	0.121	0.152	-0.014	0.021
	(0.060)**	(0.071)**	(0.077)	(0.090)*	(0.053)	(0.081)
Margin	-1.699	0.613	1.046	0.693	-0.108	-3.463
	(1.610)	(2.370)	(2.839)	(3.047)	(1.444)	(2.750)
Margin * Aligned	-2.787	-5.541	-5.431	-6.192	1.968	4.295
	(3.030)	(3.516)	(3.922)	(4.213)	(2.719)	(3.803)
Constant	-0.004	-0.139	-0.118	-0.086	0.009	-0.191
	(0.029)	(0.127)	(0.168)	(0.221)	(0.026)	(0.200)
Fixed Effects	None	State	State,Year	State * Year	None	State * Year
N	166	166	166	166	166	166
r2	0.03	0.21	0.35	0.36	0.01	0.34

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows kernel regression discontinuity estimates of cumulative abnormal returns of publicly traded firms in the month following election. The independent variable Aligned indicates the representative of the constituency where the firm's headquarters are located is a member of the state ruling coalition. Returns are measured against a market model with a value weighted index of Indian securities representing the market. Column 1 is the baseline model without fixed effects. Column 2 adds state and year fixed effects.

Table 4
Effect of MLA alignment by private/public employment

	gov1	gov2	gov3	priv1	priv2	priv3
Aligned (RD)	0.011	0.009	0.010	0.017	0.017	0.017
	(0.014)	(0.010)	(0.010)	(0.008)*	(0.007)**	(0.008)**
Margin	-0.320	-0.281	-0.325	-0.250	-0.225	-0.259
	(0.406)	(0.358)	(0.339)	(0.239)	(0.236)	(0.219)
Margin * Aligned	0.651	0.301	0.345	0.170	0.057	0.090
	(0.620)	(0.498)	(0.491)	(0.283)	(0.280)	(0.263)
Baseline Pub Emp		-0.066	-0.068			
		(0.015)***	(0.015)***			
Baseline Priv Emp					-0.024	-0.023
					(0.004)***	(0.004)***
Constant	-0.067	0.457	0.473	0.017	0.221	0.215
	(0.018)***	(0.119)***	(0.123)***	(0.010)	(0.034)***	(0.033)***
Weighted	No	No	Yes	No	No	Yes
Controls	No	Yes	Yes	No	Yes	Yes
N	662	662	662	663	663	663
r2	0.19	0.46	0.46	0.12	0.24	0.23

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows kernel regression discontinuity estimates of the effect of MLA alignment with state ruling coalition on change in constituency-level log employment growth from 1990-98 and 1998-2005 in public and private sector establishments. The dependent variable in columns 1-3 is change in log employment growth in public sector firms. The dependent variable in columns 4-6 is change in log employment in private sector firms. In each group of three, the first column is the baseline regression on year and state fixed effects, the second adds constituency-level controls, and the third weights observations by baseline log employment. Standard errors are clustered at the state level.

Table 5
Effect of MLA alignment on road and electricity growth

	Tar Road (r)	Tar km (u)	Electricity (firm)	Electricity (r)	Electricity (u)
Aligned (RD)	0.016	0.115	-0.0214	0.043	0.005
	(0.023)	(0.110)	(0.0150)	(0.031)	(0.134)
Margin	-1.241	-3.144	2.095	-0.939	3.221
	(0.559)**	(2.996)	(3.720)	(1.040)	(3.621)
Margin * Aligned	1.080	3.617	4.721	1.178	-5.976
	(0.714)	(3.791)	(5.322)	(1.252)	(4.114)
Baseline log population	0.084	0.160		0.081	0.686
	(0.006)***	(0.044)***		(0.007)***	(0.114)***
Paved approach (village)	0.277				
	(0.016)***				
Baseline paved roads (km)		-0.006			
		(0.001)***			
Mean growth	0.40	0.35	0.09	1.17	0.17
N	229	279	610	267	295
r2	0.31	0.13	0.15	0.26	0.32

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

Table 6
Effect of MLA alignment on school and hospital growth

	Primary Schools	Secondary Schools	Hospitals
Aligned (RD)	-0.022	0.008	-0.023
	(0.054)	(0.049)	(0.089)
Margin	0.573	-0.331	3.328
	(1.337)	(1.188)	(2.689)
Margin * Aligned	0.779	2.329	-4.083
	(1.937)	(1.720)	(3.581)
Baseline log population	0.334	0.285	0.219
	(0.038)***	(0.028)***	(0.034)***
Mean growth	0.16	0.10	0.12
N	325	305	239
r2	0.29	0.34	0.22

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows kernel regression discontinuity estimates of the effect of MLA alignment with state ruling coalition on change in the levels of local public goods. The dependent variables in columns 1-3 are all changes in the following variables, from 1991-2001: (1) log primary schools; (2) log secondary schools; (3) hospitals. All regressions are run at the constituency level with state and year fixed effects. Standard errors are clustered at the state level.

Table 7
Effect of MLA alignment on employment growth, credit supply/demand interactions

	(1)	(2)	(3)	(4)	(5)
Aligned (RD)	0.113	0.091	0.114	0.163	0.148
	(0.053)**	(0.066)	(0.052)**	(0.080)*	(0.072)*
Aligned * New loans	-0.040				
	(0.045)				
Aligned * Finance demand (Ent.)		0.048			
		(0.068)			
Aligned * Finance demand (ASI)			-0.029		
			(0.111)		
Aligned * Bank supply				-0.111	
				(0.091)	
Aligned * Pub bank supply					-0.060
					(0.104)
Constant	-0.040	-0.137	-0.013	-0.123	-0.105
	(0.076)	(0.081)	(0.072)	(0.083)	(0.077)
N	1378	1378	1378	689	689
r2	0.10	0.16	0.15	0.16	0.16

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows kernel regression discontinuity estimates of the effect of MLA alignment with state ruling coalition on change in annualized log employment. The electoral variables relevant to the RD are interacted with the following measures of industry-level credit demand and location-level credit supply: (i) Demand for new loans (Enterprise survey); (ii) Bank finance / working capital (Enterprise survey); (iii) Dependence on external finance ((Rajan and Zingales, 1998)); (iv) Presence of local banks; (v) Presence of local public sector banks.

Table 8
Effect of MLA alignment on employment growth, dependence on government input interactions

	(1)	(2)	(3)	(4)
Aligned (RD)	0.046	0.034	-0.003	-0.017
	(0.066)	(0.062)	(0.072)	(0.063)
Aligned * Visited by officials	0.191			
	(0.109)*			
Aligned * Mgmt time with officials		0.101		
		(0.054)*		
Aligned * Need operating license			0.125	
			(0.070)*	
Aligned * Visited by tax office				0.190
				(0.085)**
Constant	1.871	2.016	1.912	2.171
	(0.262)***	(0.154)***	(0.261)***	(0.338)***
N	1358	1351	1341	1336
r2	0.26	0.25	0.26	0.28

$^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$

The table shows kernel regression discontinuity estimates of the effect of MLA alignment with state ruling coalition on change in annualized log employment. The electoral variables relevant to the RD are interacted with the following industry-level measures of dependence of firms on government officials, drawn from the World Bank Global Enterprise Survey: (i) Business was visited by government officials in last year; (ii) % of sr. mgmt time spent with officials; (iii) Needed an operating license in past year; (iv) Visited by tax officials in last year.

Figure 1
Construction of electoral variables

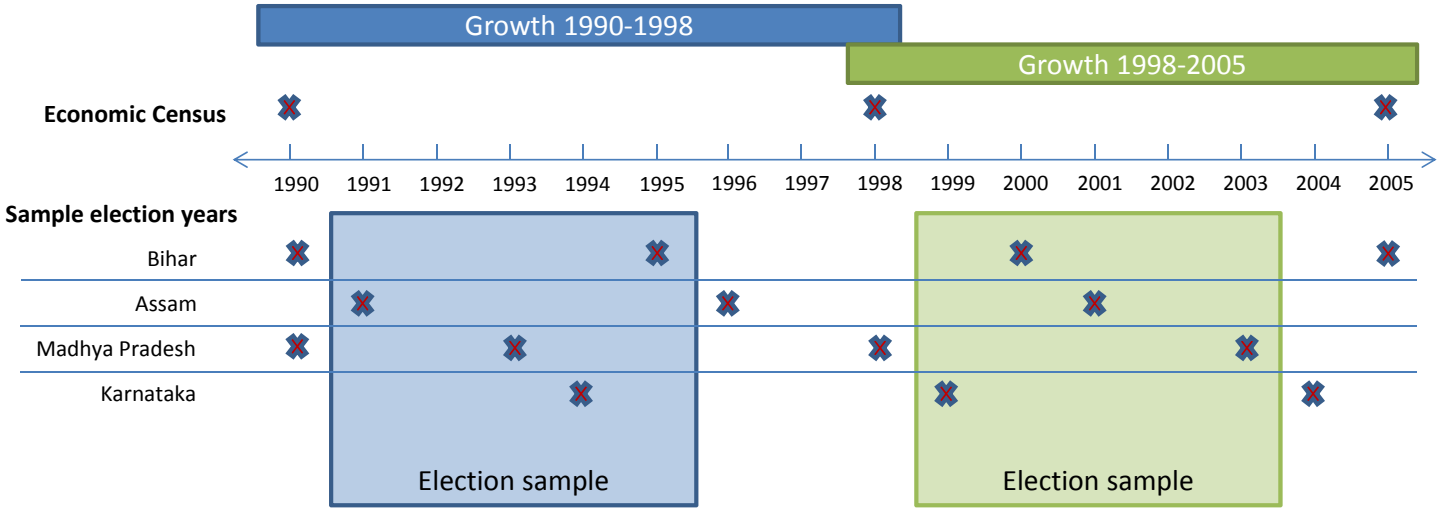
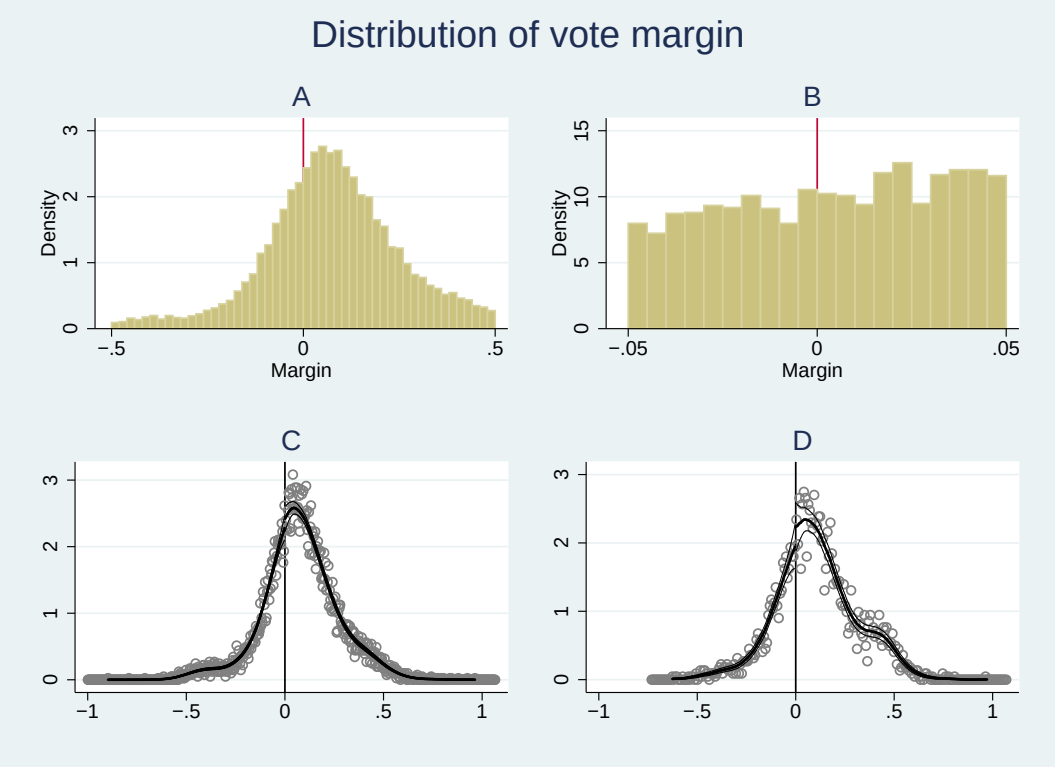


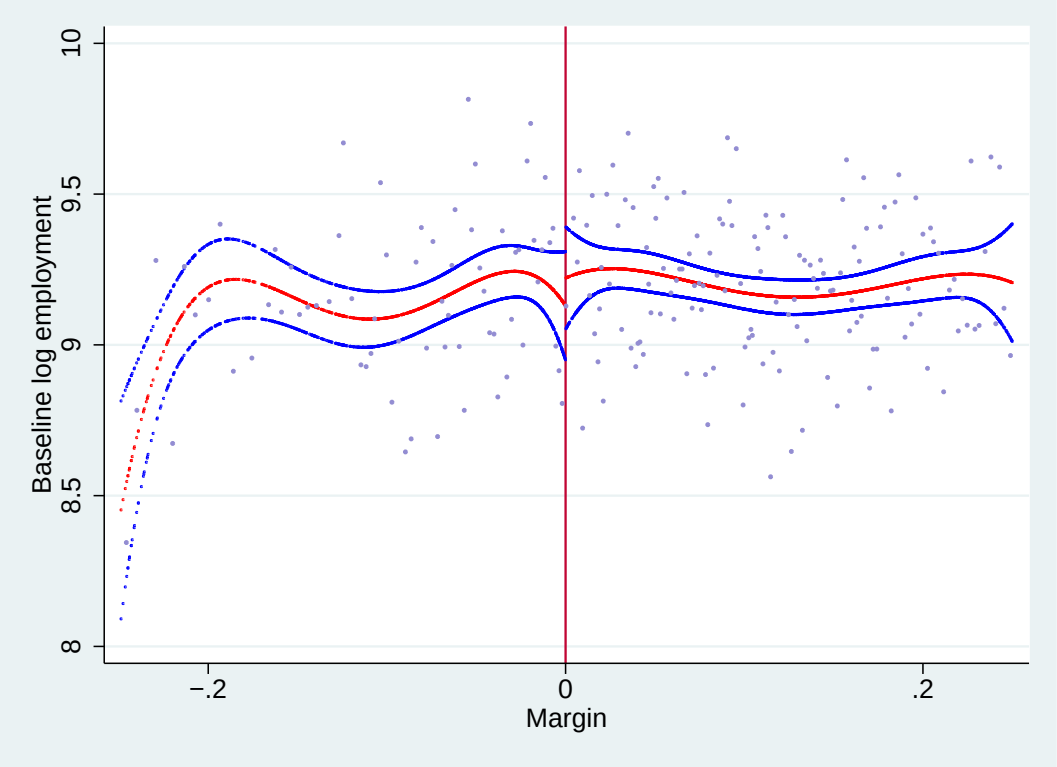
Figure 2



The figure shows the distribution of electoral win margin, defined as vote share of the top candidate aligned with the coalition ruling party minus the vote share of the top non-aligned candidate. Panel A is a histogram of this margin across all Indian elections from 1980-2003. Panel B takes the same source data but focuses on the range of margins between -5% and +5%. Panel C plots a non-parametric regression to the left- and right-hand sides of the same data following (McCrary, 2008), testing for a discontinuity at zero. Panel D restricts the McCrary test to the sample of elections matched to the population and economic census and used in subsequent analysis.

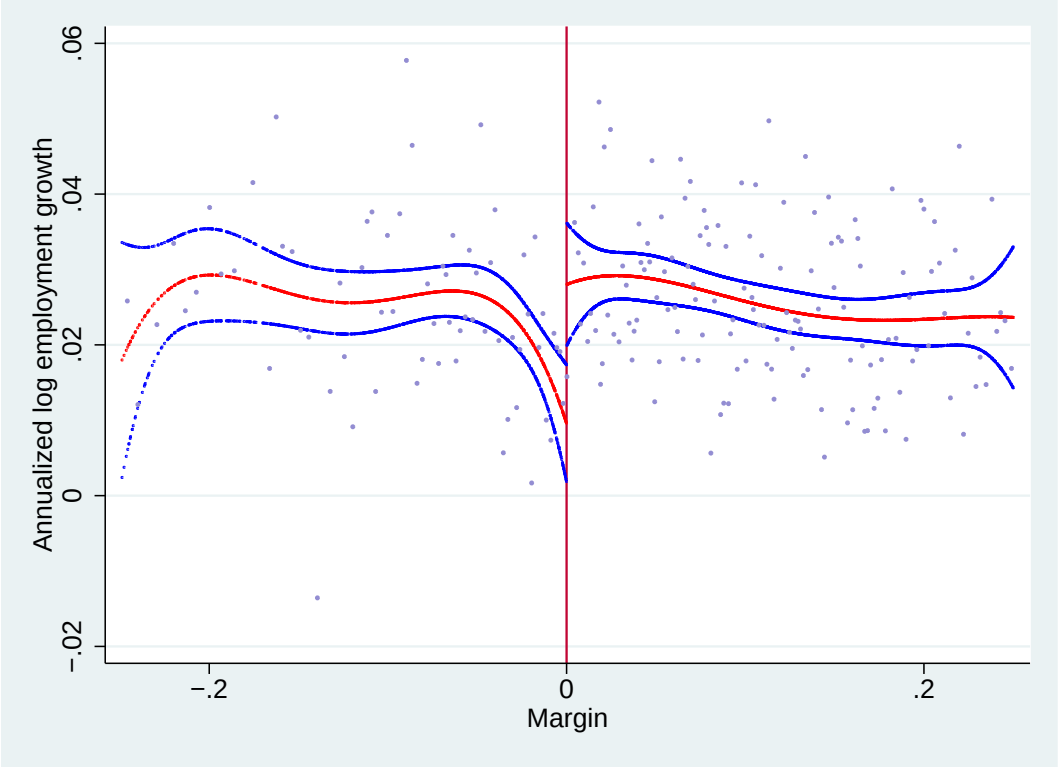
Figure 3

Balance test: Coalition win/loss margin against baseline log employment



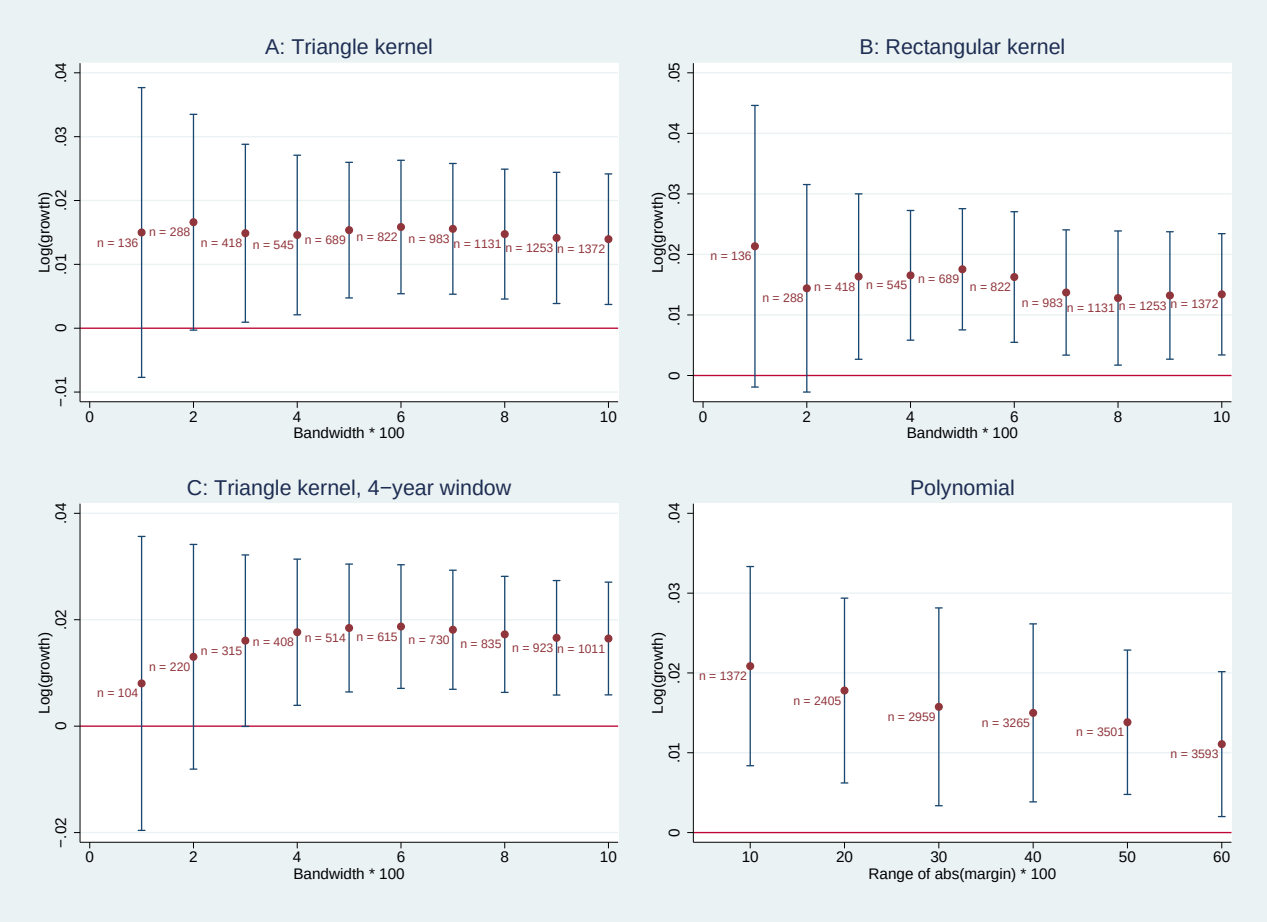
The figure plots the mean of baseline log employment, in constituencies group by the win margin of the candidate representing the state ruling coalition. Points to the right of zero are seats won by the ruling coalition. The bin size represents 0.25 percentage points, and there are approximately six observations in each bin. A non-parametric smoother is fitted separately to each side of 0.

Figure 4
Ruling coalition win/loss margin and log employment growth



The figure plots the mean log employment growth, in constituencies group by the win margin of the candidate representing the state ruling coalition. Points to the right of zero are seats won by the ruling coalition. The bin size represents 0.25 percentage points, and there are approximately six observations in each bin. A non-parametric smoother is fitted separately to each side of 0.

Figure 5
Robustness of main effect to alternate specifications



This figure plots the point estimate and 90% confidence interval of the constituency-level treatment effect of alignment with governing coalition on annualized log employment growth under a range of specifications. Panel A shows the treatment effect of equation 2 under a range of possible bandwidths. Panel B repeats Panel A using a rectangular kernel. Panel C repeats Panel A, but using a 4-year window of elections instead of a 5-year window of elections. Panel D shows the effect of limiting the range of the running variable when running the polynomial specification in equation 3. In each case, the X axis shows in percentage points the vote share of the aligned candidate minus the vote share of the non-aligned candidate.

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